SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

SITE IDs 268, 356 - 365 : BRISTOL - MYERS SQUIBB COMPANY

SITE SUMMARY REPORT

Onondaga Lake Project
Task 5: 104(e) Review

Site No. 734030-002
Work Assignment Number D003060-27

Prepared by

TAMS Consultants, Inc.
655 Third Avenue
New York, New York 10017

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1.0 SITE DESCRIPTION

The information in this report was obtained from the 104(e) responses of Bristol-Myers Squibb Company, Inc. (Bristol, Company ID 2028, Site IDs 268, and 356 through 365) as well as supplemental information from the New York State Department of Environmental Conservation (NYSDEC). Bristol responded to the initial USEPA/NYSDEC Joint Request for Information in an "Agreed Rescope Response" (Mailing No. 1, August 15, 1995). Bristol responded to NYSDEC's Supplemental Request for Information (March 11, 1997) in Mailing No. 2 (May 15, 1997) and Mailing No. 3 (June 16, 1997).

This Site Summary Report (SSR) was prepared by TAMS based on a Preliminary Draft SSR prepared by NYSDEC (April 1998) received by TAMS in February 1999.

1.1 Location

Bristol submitted a "confidential" report entitled "Summary of Historical Activities, 1943 - Present" (August 1995) that describes its facilities. This report is the basis of the following information. This information is supplemented by Bristol's May 15, 1997 and June 16, 1997 responses to the State's supplemental request for information.

Bristol has been producing health and personal care products in the Syracuse area since 1943. Bristol's presence has been in several locations within a fifty-mile radius of Onondaga Lake. These include the Thompson Road facility, the West Taylor Street facility, the Molloy Road facility, the Three Rivers property, and various warehouses. Figure 1 shows site locations for those facilities that "generated, handled, transported, treated, stored, or disposed of hazardous substances, hazardous wastes, or industrial wastes" (Question 4 of the USEPA/NYSDEC Joint Request for Information).

Thompson Road Facility

Bristol has conducted operations at the 6000 Thompson Road facility (Site ID 268) in East Syracuse since 1943. This facility is located near the intersection of Thompson Road and Burnet Avenue. The Thompson Road facility is bounded by Thompson Road on the west, Burnet Avenue on the south, both the South Branch of Ley Creek and a junk yard on the east and railroad tracks and Headson's Brook to the north. The facility is highly developed and occupies about 60 acres. The site consists of a 1.5-acre parcel of land which was used for the disposal of laboratory wastes and is currently listed as a Class 3 site on NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites (Site No. 734001) (Mailing No. 1, Attachment 1). Figure 2 shows the Thompson Road facility's layout and boundaries and the location of the Class 3 site. Table 1 identifies the building numbers shown on Figure 2, and indicates the current and past use of each building.

West Taylor Street Facility

In 1943, Bristol began operations at the West Taylor Street facility (Site ID 356). Bristol vacated the West Taylor Street facility when it completed its move to Thompson Road in 1944. The facility is in Syracuse, southeast of Onondaga Lake. West Taylor Street crosses Onondaga Creek about 2½ miles upstream of its confluence with Onondaga Lake. Bristol did not provide a site plan for this facility.

Molloy Road Facility

Bristol owned and operated the Molloy Road facility (Site ID 357) on 6012 East Molloy Road from 1980 until 1986. The facility is in the Town of DeWitt less than one mile south of Syracuse/Hancock International Airport near the Brooklawn Golf Course. The North

Branch of Ley Creek flows within ½ mile southeast of the facility. Bristol did not provide a site plan for this facility.

Three Rivers Property

Bristol has owned a 50-acre parcel in the Town of Schroeppel, Oswego County, New York, since about 1975. This parcel is undeveloped and is denoted as the Three Rivers property. While Bristol did not specify the site's location, its name would indicate it is located near the confluence of the Seneca, Oswego and Oneida rivers. The three rivers intersect about six miles north (and downstream) of Onondaga Lake. A 104(e) Site ID was not designated for this property.

Warehouses

Bristol operated warehouses in several locations in Syracuse. All of the warehouses were leased or rented except for Bridge Street 1 and 2. A summary for each warehouse is provided below.

The Thruway Building was used from an unspecified start date through the early 1970s. The facility is in the Town of DeWitt on Meyers Road, west of Interchange 34A of I-90, and southeast of the intersection of I-90 and I-481. A tributary to the North Branch of Ley Creek flows less than ¼ mile southeast of the site. Bristol did not provide a site plan for this facility. Since only packaged goods were stored at this warehouse, a 104(e) Site ID was not designated for this warehouse.

Two warehouses located on Bridge Street, known as Bridge Street 1 and 2 (Site ID 358), were owned and operated by Bristol from 1970 (Bristol 1) and 1975 (Bristol 2) through 1987/1988 when both warehouses were sold to Woodbine Development, Inc. The

warehouses are in the Town of DeWitt on Enterprise Parkway just south of I-690 and east of Bridge Street. The South Branch of Ley Creek flows less than ½ mile north of the site. Bristol did not provide a site plan for this facility.

From the early 1970s until the late 1970s, Bristol rented warehousing space on Thompson Road from Mobile Warehousing. This warehouse was known as the Mobile Warehouse (Site ID 359). The facility is in the Town of DeWitt just north of the crossing of Thompson Road and the South Branch of Ley Creek. The South Branch of Ley Creek flows within 0.1 mile southwest of the site. Bristol did not provide a site plan for this facility.

For a short period of time in the late 1970s, Bristol moved the warehousing operation from the Mobile Warehouse to the Paul Jefferies Warehousing facility on Midler Avenue. The warehouse was known as PJ's Warehouse (Midler Avenue, Site ID 360). The facility is in Syracuse just north of NY Route 5 (Erie Boulevard) and just south of I-690, east of Midler Avenue and about one mile southwest of the Thompson Road facility. Railroad lines lie adjacent to the site on the south side. Bristol did not provide a site plan for this facility.

The warehousing operation at PJ's Warehouse (Midler Avenue) was moved to Paul Jefferies Warehousing facility in Liverpool in the late 1970s. This facility, known as PJ's Warehouse (Liverpool, Site ID 361), was used until 1982. The facility is in the Town of Clay on Steelway Boulevard North about ½ mile northwest of the Liverpool Country Club. Sawmill Creek flows less than ½ mile both east and south of the site. Bristol did not provide a site plan for this facility. Starting in the early 1980s, Bristol moved the warehousing operation from PJ's Warehouse (Liverpool) to the facility on 6012 Molloy Road (Site ID 357). The Molloy Road facility is described above.

The Boss Road Warehouse (Site ID 362) was used for warehousing from an unspecified start date through the mid 1980s (1985 or 1986) when the warehousing operations moved to the

Molloy Road facility. The Boss Road Warehouse is in the Town of DeWitt about ½ mile east of Brooklawn Golf Course. The North Branch of Ley Creek flows less than ¼ mile northwest of the site. Bristol did not provide a site plan for this facility.

Bristol has rented refrigerated warehouse space at the Park Street Freezer (Regional Market, Site ID 363) since 1990. The facility is in Syracuse, just east of I-81, between Carousel Center and MacArthur Stadium, less than ½ mile east of Onondaga Lake. Ley Creek flows adjacent to the site. Bristol did not provide a site plan for this facility.

The Syracuse Cold Storage facility (Site ID 364) was used, during 1989, for storage similar to the Park Street Freezer facility. The facility is in Syracuse, in the vicinity of Matty Avenue and Wilkinson Street, north of NY Route 5 (Erie Boulevard West) and west of South Geddes Street. Onondaga Creek flows less than ¼ mile east and north of the site. Bristol did not provide a site plan for this facility.

Bristol has stored material at the Gleason Warehouse (Site ID 365) since 1992. The facility is in the Town of DeWitt, on Merman Drive, about ¾ mile south of the Thompson Road facility and just south of NY Route 5. The South Branch of Ley Creek flows about ¼ mile northeast of the site. Bristol did not provide a site plan for this facility.

In the early 1970s, Bristol stored material at the Aerofin Warehouse. Bristol could not specify the site's location other than that it was in the Eastwood area. The Eastwood area is located northeast of Sunnycrest Park which is 1¾ miles west of the Thompson Road facility. Bristol did not provide a site plan for this facility. Since only office furniture and packaging components were stored at this facility, a 104(e) Site ID was not designated for this warehouse.

1.2 Geology

Regional geology suggests that the Syracuse area surficial geology was strongly influenced by the most recent glacial advance (Wisconsin age, 12,000 to 14,500 years ago.) Syracuse occupies a region that was covered by Lake Iroquois, a glacial lake in front of the ice margin. The broad flat-lying plains from Syracuse north to Lake Ontario were formed beneath Lake Iroquois and are characterized by lacustrine fine sand and silt deposits. Additional glacial features that are common to the region are moraines, drumlins, U-shaped valleys and meltwater channels. The last feature is important to understand the geology at the various sites. Onondaga Lake and its major tributaries lie within glacial meltwater channels. These features originally formed to carry meltwater away from the glacier. They transmitted large volumes of water at high velocities. Sediment types characteristically found in meltwater channels are sand and gravel. These relic features form important water bearing and transmitting units that lie in irregularly branching, net-like patterns throughout the Syracuse area.

The Syracuse area bedrock geology includes Lower to Middle Paleozoic age sedimentary rocks predominated by carbonate (dolostone and limestone) and shale and containing some sandstone, siltstone and evaporites. Bedrock in the area is the Silurian Vernon Shale (Rickard and Fisher, 1970) which has low permeability, but does possess secondary porosity due to fractures.

Thompson Road Facility

The geology of the site is generally characterized by five stratigraphic units, including fill, marsh deposits, glacio-lacustrine deposits, glacial (vernon) till, and bedrock (Parsons, October 1995, p. 3-3). The fill material consists "primarily of brown gravel with varying amounts of sand, silt, and clay...wood, asphalt, cinders, ash, brick, and concrete fragments"

(Engineering-Science, June 1994, p. 2-3). The surficial geology that underlies the Thompson Road facility is described as Lacustrine silt and clay up to 150 feet thick. These deposits are of glacial origin and are generally calcareous. Bedrock underlying the Thompson Road facility is of the Panther Mountain Formation, consisting of shale, siltstone, and sandstone. Bedrock slopes from west to east and the overburden is thinnest in the west and thickens toward the east (Parsons, 1995, p. 4).

Other Facilities

Bristol did not provide site-specific geologic information for the remaining facilities. The regional geology described above applies to the remaining sites.

1.3 Hydrogeology

Thompson Road Facility

Site-specific groundwater data show that there are two water-bearing units at the site, fill/glacio-lacustrine and glacial till. Groundwater depth varies from about five feet by the South Branch of Ley Creek to 23 feet below ground surface at Thompson Road (Engineering-Science, November 1994). Horizontal groundwater flow in the upper water-bearing unit (fill/glacio-lacustrine) and the lower water-bearing unit (glacial till) is east toward the South Branch of Ley Creek. The horizontal gradient of both water-bearing units mimics the surface topography, being steeper in the western portion of the site (upper 0.085 feet/feet, lower 0.057 feet/feet) and flatter in the eastern portion of the site (upper 0.018 feet/feet, lower 0.022 feet/feet) (Parsons, 1995, p. 3-4). It was indicated that shallow groundwater (upper water-bearing unit) appears to discharge directly to the South Branch of Ley Creek (Parsons, 1995, p. 3-4). As stated in Engineering-Science's November 1994 report, "based on water level elevations in wells near the creek, it appears that groundwater

in the till unit (lower water-bearing unit) may flow beneath (South Branch of) Ley Creek" (p. 3-2). (Note: the speculation pertaining to the fate of groundwater in the lower water-bearing unit is not reiterated in Parson's October 1995 follow-up report, although the speculation pertaining to the fate of groundwater in the upper water-bearing unit is reiterated.) Water level measurements suggest that a downward flow potential exists between the fill and the deeper till unit (Engineering-Science, November 1994, p. 2-3).

Slug tests conducted on two wells in the central portion of the site indicate that the glacial till aquifer has a low hydraulic conductivity ranging from 0.31 feet per day to 0.35 feet per day (Engineering-Science, November 1994, p. 2-3). O'Brien & Gere's January 1994 Storm Sewer Contaminant Source Investigation report presented an average hydraulic conductivity value of 0.03 feet per day and a hydraulic gradient of approximately 0.05 feet per foot for the shallow mixed deposits. The report estimated that 81.5 gallons per day (gpd) of groundwater flow off-site (O'Brien & Gere, 1994, p. 12). Generally, neither the upper fine-grained deposits nor the lower bedrock deposits are noted for their water-bearing characteristics.

Other Facilities

Bristol did not provide site-specific hydrogeologic information for the remaining facilities. Regional hydrogeology suggests that groundwater occurs in the glacial deposits and the bedrock. The silt and clay, and till deposits are characterized as poor aquifers. Average yields range from 0.1 to 2 gallons per minute (gpm) in the till (Kantrowitz, 1970; USDA 1977). Groundwater in the area is characteristically hard and contains excessive sulfate (USDA, 1977). Groundwater within the upper 100 feet of bedrock is also likely to be salty (Engineering-Science, November 1994, p. 2-1).

1.4 Surface Water Hydrology

Thompson Road Facility

The South Branch of Ley Creek flows through and adjacent to the Thompson Road facility. The creek is channeled through Bristol's property by a ditch approximately 10 feet wide and five feet deep. The channel has steep banks and heavy vegetation. Surface water from the Thompson Road facility appears to flow to the South Branch of Ley Creek based on site topography. Headson's Brook flows southeast along the northern perimeter of the site and discharges to the South Branch of Ley Creek, as shown in Figure 2. The South Branch of Ley Creek flows northwest for about two miles through urban-industrial areas until it joins Ley Creek. Ley Creek discharges into the upstream end of Onondaga Lake approximately 3½ miles downstream of the confluence.

According to Application Form 2F of USEPA's Application for Permit to Discharge Stormwater Discharges Associated with Industrial Activity (October 1992), facility stormwater flows to the north/northwest and discharges into Headson's Brook (Outfalls 001 through 004) and the South Branch of Ley Creek (Outfalls 005 through 010) (p. 0038293). Outfalls 002, 003, 007 and 009 were permitted under New York SPDES Permit No. NY-0233251 from July 1, 1992 to July 1, 1997 (p. 0038318) and were all identified as having dry-weather flow during the period they were visually inspected in the fall of 1991 (p. 0038294).

Other Facilities

Bristol did not provide site-specific surface water hydrology information for the remaining facilities. Regional surface water hydrology suggests that all of Bristol's facilities (with the exception of the Three Rivers property) discussed in this report are located within the

Onondaga Lake drainage basin. Surface water in the vicinity of the Molloy Road and the West Taylor Street sites appears to flow into Ley Creek North Branch and Onondaga Creek, respectively. Both creeks are tributaries of Onondaga Lake. As shown in Figure 1, many of the warehouses are near tributaries of Onondaga Lake, including Sawmill Creek (PJ's Warehouse, Liverpool), Ley Creek (Park Street Freezer), Ley Creek North Branch (Boss Road Warehouse), Ley Creek South Branch (Mobile, Bridge Street, Gleason and PJ's-Midler Warehouses), and Onondaga Creek (Syracuse Cold Storage).

2.0 SITE HISTORY

2.1 Owners/Operators

Bristol submitted a "confidential" report entitled "Summary of Historical Activities, 1943 - Present" (August 1995) that describes activity at its facilities. This report is the basis of the following information. This information is supplemented by Bristol's May 15, 1997 and June 16, 1997 responses to the State's supplemental request for information.

Bristol has maintained a presence in the Syracuse area since 1943, occupying thirteen facilities, including warehouses, over that time interval (excluding the Three Rivers property).

Thompson Road Facility

Bristol's operations in Syracuse started around 1943 when Bristol purchased Cheplin Laboratories. That same year, construction started on the Thompson Road facility. Cheplin Laboratories designed and operated the Thompson Road facility while the Defense Plant Corporation owned it. Bristol acquired the Thompson Road facility in 1945 by purchasing the facility from the Reconstruction Finance Corporation.

West Taylor Street Facility

The West Taylor Street facility was originally owned by Cheplin Laboratories and subsequently purchased by Bristol in 1943. Bristol's operations at the West Taylor Street facility ceased when the move to the Thompson Road facility was completed in 1944. Atlas Linen operated at this location in 1950. According to Bristol, no other information was available.

Molloy Road Facility

Bristol owned and operated the facility on 6012 East Molloy Road from 1980 until 1986. In 1988/1989 the property was sold to Cardinal Health, the current owner.

Three Rivers Property

Bristol has owned a 50-acre parcel in the Town of Schroeppel, New York since about 1975.

Warehouses

Bristol used warehouses in several locations in the Syracuse area. All of the warehouses were leased or rented except for Bridge Street 1 and 2. The warehouses include:

- The Thruway Building was used by Bristol for warehousing from an unspecified start date through the early 1970s;
- The Bridge Street 1 and 2 warehouses were built by Bristol between 1970 and 1975 and were sold to Woodbine Development, Inc. in 1987/1988;
- The Mobile Warehouse on Thompson Road was used by Bristol in the early to mid-1970s until the late 1970s;
- PJ's Warehouse on Midler Avenue was used by Bristol for a short period of time in the late 1970s;
- PJ's Warehouse in Liverpool was used by Bristol in the late 1970s to about 1982. Starting in 1980, Bristol moved the warehousing operation from PJ's Warehouse

(Liverpool) to its facility on 6012 Molloy Road. The Molloy Road facility's ownership is described above;

- The Boss Road Warehouse was used by Bristol from an unspecified start date through the mid 1980s (1985 or 1986);
- The Park Street Freezer (Regional Market) has been used by Bristol since 1990;
- The Syracuse Cold Storage facility was used by Bristol in 1989, for storage of raw material, similar to the Park Street Freezer;
- The Gleason Warehouse has been used by Bristol since 1992; and
- The Aerofin Warehouse was used by Bristol in the early 1970s.

2.2 Site Operations

Bristol submitted a "confidential" report entitled "Summary of Historical Activities, 1943 - Present" (August 1995) that describes operations at its facilities. This report is the basis of the following information. This information is supplemented by Bristol's May 15, 1997 and June 16, 1997 responses to the State's supplemental request for information.

Table 2 shows the products manufactured at each facility, the production span and scale, the chemicals used during manufacturing and the waste material generation and handling procedures.

Thompson Road Facility

Antibiotic production and antibiotic and anti-cancer research and development have been and continue to be the major activities conducted at the Thompson Road facility since the facility was constructed. Table 1 indicates the current and past use of each building at this facility. Products manufactured at the Thompson Road facility included Penicillin G (primary product manufactured during the 1940s and 1960s), streptomycin, tetracycline (primary product manufactured during the 1950s), aspirin, sodium laurel sulfate, tartaric acid, Vitalis Bottling Line, Penicillin V (primary product manufactured during the 1970s, 1980s and 1990s), 6-aminopenicillanic acid (6-APA), semi-synthetic penicillins, kanamycin, miscellaneous fermentation products, Cephalosporin D, 7-aminocephalosporanic (7-ACA), amikacin, BHBA and butorphanol tartrate. Pharmaceutical manufacturing activities include fermentation, extraction, splitting and products finishing. The chemicals used during each step of the manufacturing processes are included in Table 2.

West Taylor Street Facility

At the West Taylor Street facility, Cheplin Laboratories was licensed by the government to produce penicillin for the war effort. Cheplin produced unspecified parenteral and other prescription products. Under Bristol's ownership, research activities were done to develop a means to generate bulk production of Penicillin G. The production operations were similar to the penicillin production described for the Thompson Road facility.

Molloy Road Facility

Bristol produced antihistamines and prepared antibiotic capsules at the 6012 East Molloy Road pharmaceutical manufacturing, filling and packaging facility. It was also used for non-penicillin warehousing storage of mostly dry bulk material although phosphoric acid was

stored here. Bristol states that Cardinal Health, the current owner, produces hypertensive products and packages emergency medical products.

Three Rivers Property

The Three Rivers Property is an undeveloped parcel with no site operations.

Warehouses

The warehousing activities are summarized in Table 3 and included the following:

- The Thruway Building was operated as a finished goods warehouse and a distribution center where only packaged, finished goods were kept (a Site ID was thus not assigned);

- Bridge Street 1 was operated as a finished goods warehouse and a distribution center although some raw materials may have been stored here prior to the completion of the Bridge Street 2 building;

- Bridge Street 2 was primarily used for storage of raw materials although some finished products were occasionally stored here. Raw material was typically dry powder although some acids were stored at this location;

- The Mobile Warehouse was used for storage of non-penicillin materials to achieve separation of penicillin from contact with other material and the storage of mostly dry bulk material, although phosphoric acid was stored at this location;

- PJ's Warehouse on Midler Avenue was used for storage of non-penicillin materials, including mostly dry bulk material, as well as phosphoric acid;

- PJ's Warehouse in Liverpool was used for storage of non-penicillin materials, including mostly dry bulk material, as well as phosphoric acid;

- The Boss Road Warehouse was used for storage of non-penicillin materials;

- The Park Street Freezer facility is used for storage of non-penicillin materials, including 7-ACA, 31AcHCL and enzymes;

- The Syracuse Cold Storage facility was used for storage of non-penicillin materials, including 7-ACA;

- The Gleason Warehouse is used for storing miscellaneous non-penicillin raw materials on a charge for use, pickup and delivery basis; and

- The Aerofin Warehouse was used for storage of office furniture and some packaging components (a Site ID was thus not assigned).

2.3 Generation and Disposal of Wastes

Bristol submitted a "confidential" report entitled "Summary of Historical Activities, 1943 - Present" (August 1995) that describes process operations at its facilities. This report is the basis of the following information. This information is supplemented by Bristol's May 15, 1997 and June 16, 1997 responses to the State's supplemental request for information.

Table 2 shows the products manufactured at each facility, the production span and scale, the chemicals used during manufacturing and the waste material generation and handling procedures. Generally, the manufacturing wastes can be classified into the following

categories: mycelia/broth solid, solvents/recovery wastes and finishing wastes. These waste materials were incinerated on-site or off-site, discharged to the sanitary sewer, recovered on-site or off-site, or sent off-site for disposal, as discussed below.

Thompson Road Facility

Waste solvents generated at the Thompson Road facility were either recovered for reuse or incinerated using both on-site and off-site facilities. Some solvents were discharged into the sanitary sewer in aqueous wash water and distilled aqueous residuals. The solvents primarily used by Bristol include: acetone, amyl acetate, butanol, heptane, hydrocarbon solvent, isopropanol, methanol, methylene chloride, MIBK (2-pentanone,4-methyl or methyl isobutyl ketone), heptane, propanol and toluene.

Prior to 1980, waste solvents generated were sent off-site for recovery or incinerated using both on-site (burning pit/landfill) and off-site facilities. According to a March 1995 letter and attached Inactive Hazardous Waste Disposal Report prepared by the NYSDEC Site Control Section, the Bristol disposal site is an "inactive landfill that was used as a burning pit to dispose unknown quantities of laboratory solvents and chemicals used by the company. The company manufactured antibiotics, penicillin, and various other drugs. The site is approximately 1.5 acres in size, and was used for about 15 years, from the mid 1950s to 1971. Small bottles of laboratory waste were dumped here at the rate of about 100-200 bottles per year. The bottles contained wastes such as acetone, peroxides, mineral oils, and spent lab chemicals. The wastes were periodically ignited and after burning out, covered over with soil. A Phase I Investigation has been completed, and Preliminary Site Assessment (PSA) was completed in December 1992. The PSA Investigation revealed the physical evidence of past disposal of hazardous waste through the discovery of gravel lined trenches containing laboratory wastes. Chlorinated solvents were found in soils and groundwater." The volumes of the bottles were not indicated in the NYSDEC summary. This inactive

landfill is a Class 3 site (a significant threat to public health does not exist) since according to NYSDEC, " the area is served by a public water supply and the contaminant levels are not significantly above standards" (Inactive Hazardous Waste Disposal Report, p. 7-83).

In 1980, a solvent recovery facility was constructed at the Thompson Road facility to recover solvents (typically methylene chloride, MIBK, and methanol). Distilled aqueous residuals from the solvent recovery operations were transported as a liquid waste stream to an off-site disposal facility. Bristol stated, "to the best of our knowledge, all off-site waste disposal took place at locations outside of Onondaga County" (Summary of Historical Activities, 1943 - Present, p. 14).

These off-site waste disposal facilities where Bristol sent its unrecoverable hazardous wastes were located in Chenango County (two) and in Oswego County (one). The two sites in Chenango County, Solvent Savers and Novak Farms, were owned and operated by Mr. Dale Hough. Novak Farms was owned and operated from the mid 1960s through 1969 and Solvent Savers was in operation between 1970 and 1973. Bristol Myers is suspected to have sent several thousand gallons of solvents per month according to NYSDEC, though no physical evidence exists to support this claim (p. A07222). The third site, located in Oswego County, was the Volney Landfill site, also known as the Oswego County Sanitary Landfill. Between 1968 and 1975, it is suspected that 8,000 drums of waste were disposed of in the landfill by Pollution Abatement Services. The contents of these drums were suspected to be organic chemicals. Bristol was a potentially-responsible party (PRP) for the Volney Landfill site and it is therefore assumed that some of its off-site disposal of hazardous waste took place at this site (pp. A0025224, A0025225, A0025269).

Wastewater generated from the washing and rinsing of process equipment between product runs and following product campaigns was typically discharged to the sanitary sewer. The following materials were routinely used in cleaning operations: caustic solutions, chelating

agents (to remove calcium build-up), acetone (recovered on-site, aqueous residuals were discharged to the sanitary sewer) and sodium hypochlorite (a strong oxidant).

The Thompson Road facility's sanitary sewer discharge has been handled as follows since operations began in 1943:

- From 1943 until the 1960s, the sanitary sewer discharge was conveyed to the Ley Creek publicly-owned treatment works (POTW) where it was treated and subsequently discharged directly into Ley Creek;

- In the 1960s, the Ley Creek POTW effluent was routed to Onondaga County's Metropolitan Syracuse Wastewater Treatment Plant (Metro WWTP); and

- In the late 1970s to early 1980s, the Ley Creek POTW was converted into a pumping station.

The sanitary sewer discharge of industrial wastewater to the Ley Creek POTW and Onondaga County's Metropolitan Syracuse WWTP was covered under Industrial Wastewater Discharge Permit Number 18 provided by Onondaga County Department of Drainage and Sanitation (OCDDS). The permits provided by Bristol were for the following periods: May 1, 1977 to May 1, 1988, May 1, 1989 to May 1, 1992, and November 6, 1992 to December 31, 1996.

These permits allowed the discharge of the following types of wastewater: sanitary wastes, equipment cleaning wastewater, caustic scrubber water, wastewater from laboratory research, storm drainage from secondary containment areas (for the May 1, 1989 to May 1, 1992 permit only) and process wastewater from the manufacturing of penicillin and antibiotic pharmaceutical drugs. The two permits which spanned from November 6, 1992 to December

31, 1996 also allowed the discharge of wastewater originating from the supporting operations for the manufacturing operations including utilities, process/product development, various maintenance shops, engineering, solvent recovery, and materials management.

West Taylor Street Facility

Waste streams from this facility are stated to be similar to the waste stream generated from the production of Penicillin G at the Thompson Road facility (Summary of Historical Activities, 1943 - Present, p. 22). Based upon this statement, the waste generated at the West Taylor Street facility included mycelia solids generated from filtering fermented material and discharged into the sanitary sewer and drummed finishing process waste. Similarly, according to Bristol, waste solvents would have been recovered for reuse. Further, distilled aqueous residuals from solvent recovery would have been discharged into the sanitary sewer. Wastewater generated from the washing and rinsing of process equipment was typically discharged to the sanitary sewer and was likely composed of the same materials used at the Thompson Road facility.

Molloy Road Facility

According to "Summary of Historical Activities, 1943 - Present," facility activities occurred from 1980 to 1986. Wastewater generated from formulation tank cleaning and excess product wastes contained ethanol, isopropanol, sorbitol and washwater. The wastewater was typically neutralized before being discharged to the sanitary sewer, in accordance with the OCDDS Industrial Wastewater Discharge Permit No. 21 (Summary of Historical Activities, 1943 - Present, p. 23). It was stated that no fermentation or chemical synthesis operations occurred at the Molloy Road facility (p. 23). However, according to an Onondaga County Industrial Waste Disposal Questionnaire, dated July 15, 1977, activities included "processing prepared (pharmaceutical) intermediates into ethical pharmaceuticals . . . filling,

packaging and warehousing intermediates, packaging materials and finished products" (p. D0008919). The application also indicated that 400 gpd of water from the Onondaga County Water Authority were used for pharmaceutical production (p. D0008920).

Process and sanitary wastewaters generated at the Molloy Road facility were discharged to the Ley Creek Treatment Plant from December 1, 1977 to December 1, 1982 under authorization of the OCDDS permit.

Three Rivers Property

Bristol vacated the Three Rivers Property undeveloped with no site operations; consequently, no waste streams were generated.

Warehouses

Bristol stated that the only waste stream from its warehousing operations was washwater generated from routine floor cleaning. Bristol stated that floor washwater was not routinely generated in significant quantities at any of the warehouses Bristol owned or leased. According to Bristol, most floors did not have floor drains and the limited washwater collected, e.g., pails or buckets, was discharged down janitor room sinks.

3.0 POTENTIAL PATHWAYS FOR RELEASE OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM

3.1 Soil

Thompson Road Facility

Soil at the Thompson Road facility can be impacted by the burning pit/landfill area (Class 3 inactive landfill), manufacturing and processing areas (deteriorated sanitary sewers, Buildings 1 and 4 area, Buildings 9 and 24 area), chemical storage areas (ST Tank Farm, Upper Main Tank Farm, Lower Main Tank Farm, CHT Tank Farm, Former Drum Storage Area 1, Former Drum Storage Area 2, Former Drum Storage Area 3, Former Drum Storage Area 4 and Former Drum Storage Area 5), and petroleum storage areas (Building 18 fuel oil underground storage tanks [USTs] and former coal pile). These areas were identified based on past and present land uses, length of time used, storage or use of hazardous substances, reported major spills and potential routes to soil (Site Contamination Study Report, November 1994, p. 2-21). These potential source areas are shown on Figure 3. The soil data provided for each area are summarized in Section 4.2.

West Taylor Street Facility

No information regarding soil quality was provided.

Molloy Road Facility

No information regarding soil quality was provided.

Three Rivers Property

No information regarding soil quality was provided.

Warehouses

No information regarding soil quality was provided.

3.2 Surface Water

Thompson Road Facility

Stormwater at the Thompson Road facility is conveyed through a separate storm sewer system. The facility's stormwater flows to the north/northwest and discharges into Headson's Brook and the South Branch of Ley Creek. According to 6NYCRR Part 895, these creeks are currently class C waterbodies. These outfalls are permitted under SPDES Permit No. NY-0233251 and are denoted Outfall 001 through Outfall 010. Spills, leaks, unpermitted releases, storm sewer infiltration from deteriorated sanitary sewer lines and overflow from sanitary sewer lines serve as potential pathways for transport of site contaminants to the South Branch of Ley Creek and Headson's Brook and consequently, to the lake system. These discharges, limited surface water data, and NYSDEC sediment sampling data from Headson's Brook and the South Branch of Ley Creek are discussed in Sections 4.1 and 4.2. Table 4 provides information on storm sewer discharges of six high volume volatile organic compounds (VOCs) used in 1991.

West Taylor Street Facility

No information regarding surface water quality at or near this site was provided. West Taylor Street crosses Onondaga Creek, a class C watercourse, about 2 ½ miles upstream of its confluence with Onondaga Lake.

Molloy Road Facility

No information regarding surface water quality at or near this site was provided. The North Branch of Ley Creek, a class C watercourse, flows within ½ mile southeast of the site. Also, a tributary to the North Branch of Ley Creek, also a class C watercourse, flows within ¼ mile east of the facility.

Three Rivers Property

No information regarding surface water quality at or near this site was provided. As the Three Rivers property is an undeveloped parcel, it presents little potential for contamination to enter the Seneca River. This property is downstream of Onondaga Lake.

Warehouses

No information was provided regarding surface water quality at or near any of the warehouses.

Two tributaries to the North Branch of Ley Creek, both class C watercourses, flow less than ¼ mile southeast and north of the Thruway Building.

The South Branch of Ley Creek, a class C watercourse, flows less than ½ mile west of the Bridge Street 1 and 2 Warehouses. Additionally, a pond, also a class C watercourse, lies less than ½ mile south of the buildings.

The South Branch of Ley Creek, a class C watercourse, flows within 0.1 mile southwest of the Mobile Warehouse.

Sawmill Creek, a class C watercourse in this area, flows less than 1,300 feet both east and south of PJ's Warehouse in Liverpool.

The North Branch of Ley Creek and a tributary to the North Branch of Ley Creek, both class C watercourses, flow by the Boss Road Warehouse.

Ley Creek, a class C watercourse in the area near Onondaga Lake, flows past the Park Street Freezer (Regional Market) site.

Onondaga Creek, a class C watercourse in this area, flows less than ¼ mile east and north of the Syracuse Cold Storage site.

A tributary to the South Branch of Ley Creek, a class C watercourse, flows less than ¼ mile northeast of the Gleason Warehouse.

3.3 Groundwater

Thompson Road Facility

Groundwater at the Thompson Road facility can be impacted by the burning pit/landfill area (Class 3 inactive landfill), manufacturing and processing areas (deteriorated sanitary sewers,

Buildings 1 and 4 area, Buildings 9 and 24 area), chemical storage areas (ST Tank Farm, Upper Main Tank Farm, Lower Main Tank Farm, CHT Tank Farm, Former Drum Storage Area 1, Former Drum Storage Area 2, Former Drum Storage Area 3, Former Drum Storage Area 4 and Former Drum Storage Area 5), and petroleum storage areas (Building 18 fuel oil USTs and former coal pile). These areas were identified based on past and present land uses, length of time used, storage or use of hazardous substances, reported major spills and potential routes to groundwater (Site Contamination Study Report, November 1994, p. 2-21). These potential source areas are shown on Figure 3. The groundwater data provided for each area and perimeter groundwater sampling are summarized in Section 4.2. The location of the on-site monitoring wells are shown on Figures 4 and 5.

West Taylor Street Facility

Bristol did not provide any groundwater quality information at this location.

Molloy Road Facility

Bristol did not provide any groundwater quality information at this location.

Three Rivers Property

Bristol did not provide any groundwater quality information at this location.

Warehouses

Bristol did not provide any groundwater quality information at these locations.

3.4 Air

Thompson Road Facility

Operations at the Thompson Road facility have resulted in air emissions. The landfilling and burning practices at the inactive Class 3 landfill (discussed in Section 2.3) at the Thompson Road facility certainly resulted in air emissions. For about fifteen years (mid 1950s to 1971), Bristol dumped wastes such as "acetone, peroxides, mineral oils, and spent lab chemicals" in a burning pit and ignited the wastes (Bristol, Mailing No. 3).

In an August 10, 1992 response to USEPA's Clean Air Act Section 114 Information Request, Bristol provided a mass balance of the VOCs which were used at the Thompson Road facility (see Table 4). The amount of VOCs which were lost to the atmosphere ("point and non-point losses") in 1991 was in excess of 2,320 tons (p. D0012920) (note: this summary table only lists high volume VOCs and does not include methylene chloride which is "explicitly exempt from 6NYCRR233" [p. D0012900]). In addition, Bristol estimated that the total VOC emissions from pilot plant operations alone at Buildings 24A and 25 are 70 tons/year (p. D0012916). The major VOCs in these emissions include acetone, acetonitrile, isopropanol, methanol, MIBK, and toluene.

West Taylor Street Facility

Bristol did not report air emissions from the West Taylor Street facility.

Molloy Road Facility

Bristol did not report air emissions from the Molloy Road facility.

Three Rivers Property

As the Three Rivers property is an undeveloped parcel, air emissions would not be expected.

Warehouses

Bristol did not report air emissions from the warehouse facilities.

3.5 County Sewer System

Thompson Road Facility

The Thompson Road facility discharges its sanitary and industrial wastewater into the Onondaga County sanitary sewer system pursuant to pretreatment requirements established by an Industrial Wastewater Discharge Permit (Permit Number 18) issued by OCDDS. Table 4 provides information on sanitary sewer discharges of six high volume VOCs in 1991, including approximately 150 tons of MIBK and 150 tons of acetone. In the late 1970s, Onondaga County issued a discharge permit to the Thompson Road facility with the condition that discharges to the sewer system be brought within specified pH limits by the first quarter of 1980. Bristol installed a wastewater pH control system in Building 48 (see Figure 2) and began controlling the pH of the facility's wastewater discharge in 1980. The pH control system was unreliable and in 1987 and on other occasions, Bristol intermittently discharged industrial wastewater to the sanitary sewer outside the pH range prescribed in the Thompson Road facility's discharge permit (p. D0012346). It was indicated that "there are frequent and sometimes lengthy excursions outside the limits" imposed by OCDDS (p. D0012350). Federal pretreatment standards require that discharges into a POTW must have a pH greater than or equal to 5.0 (40 CFR Section 403.5(b)(2)) (p. D0012346). A summary of the Notices of Violations (NOVs) received by Bristol is provided in Section 4.1. Sanitary

sewers with extensive deterioration could serve as a pathway for contaminants from industrial wastewater to enter the lake system. The investigation and rehabilitation of the sanitary sewers is discussed in Section 4.2.

West Taylor Street Facility

Bristol did not provide information regarding sewer use for this facility but stated that waste generation was similar to the Thompson Road facility. Thus, waste disposal to the sewers would have been practiced. As the period of operation was over 50 years ago, any past releases to the sewer system would be difficult to assess.

Molloy Road Facility

According to the OCDDS Industrial Wastewater Discharge Permit No. 21, the Molloy Road facility discharged its sanitary and industrial wastewater from December 1, 1977 to December 1, 1982 into the sanitary sewer flowing to the Ley Creek Treatment Plant (p. D0008929). Bristol stated that wastewater from formulation tank cleaning and excess product was discharged to the sanitary sewer. The wastewater is stated to have been neutralized and contain ethanol, isopropanol and sorbitol. Monitoring data and NOVs were not found in Bristol's response.

Three Rivers Property

As the Three Rivers property is an undeveloped parcel, industrial wastewater discharges to the sanitary sewer would not be expected.

Warehouses

Bristol stated that the waste stream from its warehousing operations was washwater generated from routine floor cleaning. According to Bristol, most floors did not have floor drains and the limited washwater collected, e.g., pails or buckets, was disposed down janitor room sinks.

4.0 LIKELIHOOD OF RELEASES OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM

4.1 Documented Releases

Documented Spills

Headson's Brook is located along the northern perimeter of the Bristol property and flows east until its confluence with the South Branch of Ley Creek. Pollution at Headson's Brook was first noted and documented in December 1967 at the Onondaga County Health Department Subject Abatement Conference. At this conference, it was decided that sampling would be conducted to determine the intermittent source of pollution (p. 005095). Between December 1967 and February 1968, the pollution, as determined by Bristol, was believed to be industrial waste from their stormwater outfalls (Outfalls 1, 2, and 3) located along Headson's Brook. Investigations showed industrial wastes to be directly discharging into the storm sewer system instead of the sanitary sewer system (p. 005069). During October and November 1968, surface water samples collected from Headson's Brook showed chemical oxygen demand (COD) concentrations between 200 mg/L and 2,000 mg/L. Days in which the brook exhibited elevated COD levels corresponded with days when sludge was being removed from the tower water basins. Two of the towers located in the cooling tower area drained directly into the storm sewer system leading to Headson's Brook (pp. 005067-005068). High COD concentrations were also believed to be a result of leaks in the sanitary pipe lines as well as cross connections between sanitary and storm pipelines. Between 1968 and 1969, the underground sewer piping system was reworked to eliminate various cross connections and other points where process or sanitary wastes might have been entering the storm sewer system instead of the sanitary sewer system (p. 005095).

No additional problems were documented at Headson's Brook until 1976. According to the information provided by Bristol, in July of 1976, 2,300 gallons of number 6 fuel oil were discharged directly to Headson's Brook. Straw oil booms were placed along the sides of the South Branch of Ley Creek and the banks of Headson's Brook were excavated to remove the oil coating. No information was provided regarding the fate of the oil that remained within the water body itself (pp. 000601-000602). On March 18, 1987, the sanitary sewer line at Bristol had overflowed discharging soot into Headson's Brook. The soot (volume estimates were not provided) was seen on the creek bed and on the banks but no oil was discharged. By advisement of NYSDEC Region 7, the area near the outfall was cleaned and all debris was removed. No further action was taken (p. 326426).

On April 12, 1988, "damage to a 42 inch county sewer line near the Ley Creek pump station resulted in all flows being directly diverted to Ley Creek and ultimately to Onondaga Lake without any treatment at the Metro plant" (p. 326425). Characterization of the 1988 sanitary sewer discharges was not found in Bristol's responses. In 1985, Bristol discharged on average, 1.28 million gallons per day of wastewater to the sewer with the following average loadings: biochemical oxygen demand (BOD) loading of 33,800 lbs/day, total suspended solids (TSS) loading of 20,000 lbs/day, and a total phosphorus (TP) loading of 300 lbs/day (p. D0020893). Repairs to the county sewer line were estimated to take three to four weeks. Bristol was not advised to decrease their discharges, however, special care was reportedly taken during this period to prevent any accidental solvent spills to the sewer (p. 326425). In 1989, an oil spill occurred along Burnet Avenue entering the South Branch of Ley Creek. The investigation, lead by NYSDEC, determined that the spill occurred in a storm sewer upstream from the Bristol site. Oil absorbent pads were installed across the creek and the storm sewer outlet. The source and magnitude of the spill are unknown "because the storm sewer manholes have been paved over and none of the Bristol's storm sewers drain into

Burnet Avenue" (p. 000416). During the years 1991 to 1992, a total of 23 spills occurred on the roadways in the Bristol facility.

On May 21, 1982, Bristol received an Order on Consent from the NYSDEC stating Bristol "has discharged water containing pollutants including methylene chloride from certain storm water outfalls into the waters of the state . . . without a SPDES permit . . . and Bristol has filed a SPDES permit application with the Department for storm sewer outfalls numbered 002, 003, 007 and 009, which presently show evidence of industrial chemical contamination discharges..." (pp. 0038490-0038492).

Numerous spills to the Thompson Road facility's sanitary sewer system between 1984 and 1995 were documented. During 1984 and 1985, 18 spills consisting of methanol, process wastewater, MIBK, and methylene chloride occurred between the ranges of 10 to 4,900 gallons. The largest spill in this period was methanol from the tank CHT-5 overflow (pp. 000538-000600). Between 1986 and 1987, 25 spills involving MIBK, acetone, DMA, mother liquor, DCHA, ethylene glycol, butanol, methanol, and lard oil were released into the sanitary sewer; the spills ranged between 50 to 1,100 gallons (pp. 000451-000532). On October 3, 1986, Bristol issued an internal memo to all manufacturing and material handling operating personnel stating "we continue to experience 'spills' of bulk solvents to the sanitary sewer at an alarming and unacceptable rate" and went on to describe disciplinary action that would be taken for those who failed to report a spill or ". . . have repeated instances of spills under their responsibility" (p. D0020990).

Twenty spills into the sanitary sewer system occurred in 1988 and 1989, the largest being 2,000 gallons of methanol brine; other chemicals included acetone, butanol, lard oil, oil, and MIBK. In addition, three high pH excursions occurred during this time period (pp. 000413-000450). Three spills occurred in 1990; the largest being 800 gallons of MIBK into the

sanitary sewer system (pp. 000403-000412). Between the years 1991 and 1995, numerous spills to the sanitary sewer system occurred. These spills involved all of the above-mentioned chemicals in similar magnitudes (pp. 000032-000276). Additional information on spills which occurred between 1976 and 1992, and were greater than 1,000 gallons, is provided in Table 5. Appendix A contains information found in Bristol's response relating to additional spills at the Thompson Road facility.

Ongoing/ Recent Releases

Storm Sewer System

Between 1991 and 1995, the Thompson Road facility reported discharging pollutants to the storm sewer system. Bristol provided information on seven spills to the storm sewer system in 1991 (two of the seven spills were reported to have reached Ley Creek) (pp. 000280-000402). These spills included chemicals such as mother liquor, sodium POAC, condensate from steam traps, cooling tower backwash, 7-ACA wastewater stream, MIBK and methanol (pp. 000276-000344). Bristol reported that 1,500 gallons of APA mother liquor from the centrifuge feed tank (refer to Table 2 for chemicals used in the manufacturing process) were found "running down the gravel slope at the south end of Building 59 . . . and into the nearest storm sewer" (p. 000345). Bristol reported that 1,000 gallons of a solution containing methylene chloride, methanol, and water were spilled to the storm sewer system on July 1, 1991 and were suspected to have reached Ley Creek (p. 000342). Bristol also provided information stating that 46 gallons of MIBK were discharged into the storm sewer on November 19, 1991 and were conveyed to Ley Creek via the storm sewer (p. 000272). In addition, 5,000 gallons of methanol were spilled between August 13 and August 21, 1991. The fate of the methanol is not specified in the release report submitted by Bristol (p.

000288). Between 1994 and 1995, Bristol provided information on three minor spills to the storm sewer system (pp. 000032-000076).

Bristol provided information on nine spills to the storm sewer system from 1992 to 1993. These spills consisted of constituents such as mother liquor from the VE tank farm, broth solids, isopropanol, cooling tower water, Ceph permeate, ammonium sulfate, fluoroxene dye, methanol-water mixture, acetone, and infiltration (pp. 000111-000200). On May 12, 1992, a "broken" sanitary sewer line (carrying MIBK, n-butanol and broth solids [high TSS and BOD]) was found leaking into a cracked storm sewer manhole and discharging to storm sewer Outfall #3 (Headson's Brook) (pp. 000172-000174). Bristol estimated that one gallon per minute of these wastes entered the storm sewer system for a period less than 24 hours (p. 000173). Production was immediately shut down with the discovery of this leak and the wastes were then directed into a pipe bypassing the sanitary sewer. The storm sewer manhole was flushed with clean water and pumped to the sanitary sewer system until clean water was seen at Outfall #3. The sanitary sewer was replaced and affected soils were excavated to a roll-off for analysis and disposal (p. 000173). Bristol did not provide soil volume estimates, soil analytical data, or disposal location information.

Sanitary Sewer System

According to Attachment A of a "Notice of Intent to Sue" letter from a representative of the Atlantic States Legal Foundation, Inc., dated September 15, 1989, the Thompson Road facility had the following exceedances of their OCDDS permit for discharges to the sanitary sewer from January 1988 to July 1989: 60 exceedances of Total Kjeldahl Nitrogen (TKN) ranging from 218 mg/L to 1,010 mg/L (permit limit of 40 mg/L), 22 exceedances of phenolic compounds ranging from 5.2 mg/L to 13.2 mg/L (permit limit of 4.5 mg/L), pH violations ranging from 1.8 to 5.3 and 9.6 to 13.6 (permit limit between 5.5 and 9.5), 176 exceedances

of total phosphorus ranging from 11 mg/L to 44 mg/L (permit limit of 10 mg/L), two exceedances of TSS ranging from 54,959 lb/day to 65,367 lb/day (permit limit of 50,000 lb/day), and 202 exceedances of BOD ranging from 323 mg/L to 8,670 mg/L (permit limit of 300 mg/L) (pp. D0020852-D0020859). Based on six to seven months of weekly samples collected in 1992, the average flow rate of the Thompson Road facility's industrial wastewater was 1.29 million gallons per day with average mass loadings in pounds per day of the following compounds: BOD (45,600), TSS (25,300), total phenol (13), acetone (700), n-butanol (435), ethyl alcohol (400), isopropanol (345), methanol (520), and MIBK (1,180) (Engineering-Science, May 1994, Table 2.1).

Bristol provided information on eight Notices of Violations (NOVs) from OCDDS relating to discharges into the sanitary sewer system during the years 1990 to 1993. In 1990 and 1991, Bristol incurred five violations for pH ranging from 1.99 to 12.78 at Building 48 (permit limit range is 5.5 - 9.5 as stated in the Onondaga County Rules and Regulations Relating to the Use of the Public Sewer System) (p. D0012574). Several of the NOVs in 1991 were issued due to improper notifications of spills to County personnel by the terms of Bristol's Industrial Wastewater Discharge Permit. In 1992, Bristol was issued a NOV for effluent limitations because of wastes discharged into the county sewer system that may have been "sufficient alone or in interaction with other chemicals to cause fire or explosion, a hazard to human health, a public nuisance, and oxygen demanding wastes that would result in interference to wastewater treatment at the METRO plant" (p. D0012573). The discharges resulted in the presence of hydrogen sulfide in the county sewer system in violation of the permit. A second NOV was issued to Bristol in 1992 due to a MIBK spill that was not immediately reported to the OCDDS in violation of the permit.

In 1993, two NOVs were issued for phenol limit violations and improper notification of a methylene chloride spill. Three violations occurred based on phenol concentrations of 4.54

mg/L, 5.24 mg/L, and 6.9 mg/L, as compared to the phenol permit limit of 4.5 mg/L. The methylene chloride spill of 100 gallons was not immediately reported which was also in violation of the permit.

On April 24, 1992, the Thompson Road facility was placed on the List of Violating Facilities maintained under USEPA's Contractor Listing Program as the result of a judgement of conviction entered following a guilty plea by Bristol to four misdemeanor counts of negligent violations of the Clean Water Act (United States v. Bristol-Myers Squibb Company, No. 92-CR-123, N.D.N.Y.) (p. D0012340). In April 1992, Bristol, the United States and the State of New York entered into a Plea Agreement that "resolved all matters rising out of a joint federal-state investigation which began in 1988" (p. D0012343). The Plea Agreement included, among other items, the following terms (as stated on pp. D0012549-D0012558):

- Bristol agreed to enter a plea of guilty to four misdemeanors for negligent discharges under the Clean Water Act;
- Bristol agreed to pay $500,000 to the United States and $3 million to the State of New York;
- Bristol agreed to build and place into operation by December 31, 1996 an industrial wastewater pretreatment facility to treat all of the industrial wastewater which is discharged to the county sewer system including, but not limited to, nitrogen, phosphorus, BOD, TSS and solvents at a cost of up to $30 million but in no event less than $10 million; and
- The United States and the State of New York agreed not to seek additional criminal charges against Bristol, or any of its present or former officers, directors or employees, for any violation of federal or state law related to the investigation at the Thompson Road facility up to the date of the agreement.

Two of the misdemeanor counts relate to the facility's sanitary sewer system. Bristol plead guilty to two counts of negligent discharge, in September and October 1987, of industrial wastewater which did not comply with applicable pH pretreatment limits (pH concentrations as low as 1.70 and 2.92, respectively) for discharges into the county sewer system (p. D0012560).

The other two misdemeanor counts relate to the facility's storm sewer system. Bristol plead guilty to two counts of negligent discharge of water containing pollutants into the waters of the United States on or about March 1990 without a SPDES permit. Storm sewer discharge sampling data provided by the government "indicated acetone levels in storm sewer Outfall 3 (Headson's Brook) ranging from 1.8 to 4.0 ppm, MIBK levels from 0.95 to 9.1 ppm, and methylene chloride levels from 0.022 to 0.210 ppm. Subsequent sampling by the Syracuse facility (Thompson Road facility) indicated the presence of additional constituents (n-butanol, methanol and toluene) and conventional parameters, including BOD, COD, fecal coliform, nitrogen, phosphorus and metals" (pp. D0012350-D0012351). In 1990, Bristol began a comprehensive evaluation of the storm sewer system to identify and address inappropriate connections: "lines connecting to the storm sewer from floor drains, sinks and the like, as well as discharges of condensate" (p. D0012352). These inappropriate connections were "found and corrected" (p. D0012352) in 1990 although the facility had been in operation since the 1940s.

West Taylor Street Facility

Bristol did not provide information on documented releases for this facility. During the period of operation, releases similar to the Thompson Road facility could be expected due to the similar nature of operations.

Molloy Road Facility

Bristol provided no information on documented releases for this facility. During the period of operation, releases similar to the Thompson Road facility could be expected due to the similar nature of operations.

Three Rivers Property

There are no documented releases for the Three Rivers property which is an undeveloped parcel.

Warehouses

As stated in Section 2.3, Bristol's only waste stream from the warehouses was washwater generated from floor cleaning, which was ultimately discharged to the sanitary sewer. No other information on releases or spills was provided for their operation at the warehouses.

4.2 Threat of Release to the Lake System

4.2.1 Extent of Site Contamination

Thompson Road Facility

Various investigations have been conducted at the Thompson Road facility since 1989. The investigations were conducted in response to leaks, as part of chemical storage tank closure plans or upgrades, and as required by the May 14, 1992 Consent Order which relates to damaged storm sewer pipes and outfalls (Site Contamination Study Report, Engineering-

Science, November 1994, p. 2-12). A summary of the investigations at each of the potential source areas is provided below.

Class 3 Inactive Landfill

As part of an Order on Consent (1992) between NYSDEC and Bristol, a Preliminary Site Assessment (PSA) (December 1992) and a PSA Supplemental Report (March 1994) were prepared by Blasland, Bouck & Lee, Inc. (BB&L) for Bristol. Although previous reports were prepared on this inactive landfill, the PSAs are the first to include sampling and analytical data (BB&L, December 1992, p. 21). The 1.5-acre landfill was used from the mid-1950s until 1971 for the disposal/burning of vials containing laboratory waste (acetone, peroxides, mineral oils, and spent lab chemicals) (Mailing No. 3, p. 7-83), coated penicillin, phosphorus pentachloride, and construction debris (BB&L, December 1992, p. 18). Following incineration, the trenches were backfilled. No written records exist describing the precise location of these trenches (BB&L, December 1992, p. 1).

The inactive landfill site drains to the South Branch of Ley Creek (shown on Figure 5) and this portion of the South Branch of Ley Creek as well as the site are located within the 100-year floodplain (BB&L, December 1992, p. 18).

Analytical data associated with the inactive landfill provided by Bristol are presented in Appendix B and Figure 5. Sample locations are shown on Figure 5. It should be noted that there is a discrepancy between the units for inorganic analysis presented in the tables and figures in the BB&L report compared to that which is presented in Appendix 1 of the BB&L report (Data Validation Reports, Attachment II Data Summary). The data summary (which seems more reasonable) reports the inorganics unit as mg/kg (ppm) while the figures and

tables report the unit as ug/kg (ppb). For this report, it is assumed that the units (mg/kg) provided in the data summary (for inorganics) are correct.

Eleven test pits were excavated within the site at a depth of up to 10 feet or to groundwater (BB&L, December 1992, p. 11). Eight of the locations were based on 100 foot spacing, and three locations were based on field judgement and observations (BB&L, December 1992, p. 11). Locations of the test pits are shown on Figure 5. Soil samples were obtained at two foot intervals, with only the sample with the highest photoionization detector (PID) headspace readings going to the lab for analysis of TCL parameters and hazardous waste characteristics (i.e., ignitability, reactivity, corrosivity, and EP Toxicity) (BB&L, December 1992, pp. 11-13). Waste materials (charred, black material underlain by 1 to 3 inch diameter stone) were reported to be located in five locations on the site although only three locations (Test Pit 5 [TP-5], TP-11 and stained soils in the concrete structure [shown on Figure 5]) are mentioned and only three waste samples (WS) were obtained (BB&L, December 1992, p. 23).

Methylene chloride, acetone, 1,2-dichloroethene, and trichloroethene were detected in the test pit samples and the background sample (located across the South Branch of Ley Creek at two feet below ground surface), none of which were present in concentrations greater than NYSDEC (November 1992) recommended soil cleanup objectives (BB&L, December 1992, p. 24). Semi-volatile organic compounds (naphthalene, flourene, phenanthrene, anthracene, flouranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)flouranthene, benzo(k)flouranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene) were detected at concentrations which exceeded the NYSDEC (November 1992) recommended soil cleanup objectives in all soil samples collected with the exception of TP-1 (BB&L, December 1992, p. 24). Several pesticides (4,4-DDD, 4,4-DDT, methoxychlor, and gamma-chlordane) were detected in the soil samples, none of which were present in concentrations greater than the NYSDEC (November 1992) recommended soil

cleanup objectives (BB&L, December 1992, p. 25). PCBs (Aroclor 1248) were detected in one sample but at a concentration less than the NYSDEC (November 1992) recommended soil cleanup objective (BB&L, December 1992, p. 25). No samples exhibited hazardous waste characteristics as defined by 6NYCRR Part 371 (BB&L, December 1992, p. 25).

Only three monitoring wells were installed at the site at the locations shown on Figure 5. Soil samples with the highest PID readings were obtained from the soil borings and were analyzed for TCL parameters and hazardous waste characteristics. Based on water level readings made during the PSA, the direction of groundwater flow in the unconsolidated geologic units is to the east away from the South Branch of Ley Creek ("contrary to the anticipated groundwater flow direction") (BB&L, December 1992, p. 20) at an approximate hydraulic gradient of 0.005 feet/feet. Hydraulic conductivity of the unit ranges from 9.8×10^{-5} cm/s to 1.1×10^{-4} cm/s (BB&L, December 1992, p. 20). VOCs (1,1-DCA and 1,1,1-TCA) were detected in two monitoring wells at concentrations which exceeded New York State groundwater quality standards (BB&L, December 1992, p. 26). Iron, magnesium and sodium were detected in concentrations which exceeded groundwater quality standards (BB&L, December 1992, p. 29). No SVOCs, pesticides or PCBs were detected in the groundwater samples (BB&L, December 1992, p. 26).

Only one round of surface water sampling (two samples) was conducted during the PSA. Acetone was detected in the South Branch of Ley Creek at concentrations of 10 ug/L in the upstream sample (which is only approximately 20 feet upstream of the landfill border) and 61 ug/L in the downstream sample (no other VOCs, SVOCs, pesticides or PCB compounds were detected in either sample) (BB&L, December 1992, p. 22). Metals were detected in both samples, none exceeded ambient water quality standards (BB&L, December 1992, p. 22).

Air monitoring was also conducted at the site. No organic vapors were measured above the action levels during the on-site activities (BB&L, December 1992, p. 22).

As part of the supplemental PSA, additional groundwater samples were collected from existing groundwater monitoring wells (MW-1B, MW-2B and MW-3B) and three subsurface soil samples were collected in the vicinity of each monitoring well. The analytical data are presented in Appendix B. Only well MW-1B showed the presence of VOCs; both 1,1-dichloroethane and 1,1,1-trichloroethane were detected at a concentration of 5 ug/L. In addition, groundwater elevations were measured at each of the three wells to confirm the direction of groundwater flow. It was confirmed that the groundwater flows in an easterly direction away from the South Branch of Ley Creek.

The VOCs detected in the soil are shown on Figure 5. The soil sample collected from the subsurface near MW-1B (A1-SS-1) was of a rusty color and indicated the presence of acetone at 30 ug/kg. The second soil sample (A1-SS-2) located near MW-2B detected the presence of acetone at 77 ug/kg and 2-butanone at 16 ug/kg. In the third soil sample (A1-SS-3) located near MW-3B, acetone was detected at a concentration of 16 ug/kg. BB&L concluded from these results that the threat to public health and the environment was not significant. Also, NYSDEC concluded that since "the area is served by a public water supply and the contaminant levels are not significantly above standards, a significant threat does not exist and a classification of 3 is justified" (NYSDEC, March 1995).

Deteriorated Storm and Sanitary Sewers

Bristol obtained the services of O'Brien & Gere Engineers, Inc. (OB&G) to perform field activities associated with preparation of a stormwater permit application (OB&G, p.1). The SPDES permit identified twelve tasks "associated with identification and control of potential

contaminant sources within the storm and sanitary sewers" (OB&G, p. 1). One requirement of the SPDES permit outlined rehabilitation of storm sewer outfalls 002, 003, 007 and 009 due to dry-weather flows at these locations (OB&G, p. 1). Approximately 6,600 linear feet of storm sewer piping were relined and 120 manholes were rehabilitated in September 1992 (OB&G, p. 1).

It was indicated in a Bristol memo dated 1987 that average losses to groundwater from sanitary sewers for the years 1982 to 1984 ranged from 49,000 gpd to 67,000 gpd (p. 0037096). Television and visual inspections along Trunklines 1-5, 7, and 8 of 14,500 linear feet of the sanitary sewer were conducted between November 30, 1992 and January 25, 1993 to identify potential sources of chemical constituents entering the storm sewer and to determine the extent of groundwater contamination. Results of the television inspections indicated 8,100 feet of pipe in the sanitary sewer system were showing varying degrees of deterioration. The Storm Sewer Contaminant Source Investigation study (O'Brien & Gere Engineers, Inc., January 1994) recommended that the sanitary sewer be lined with an impermeable liner and that groundwater samples be collected along the sewer lines with the Geoprobe system. The analytical results were to be used as a screening tool to determine if contaminants are present at environmental concern, and to assess the potential presence of a source area and the need for additional sampling (Parsons 1995, p. 2-1). A total of 8,484 linear feet of the sanitary sewer was relined using the Insitu-form process between April 18 and July 26, 1995.

During this time, 48 geoprobe samples and one resample were collected along Trunklines 1, 5, 7, and 8 (Parsons Engineering Science, October 1995, p. 4-2). Geoprobe locations along the sewer lines were placed within or as close as possible to the sewer bedding material (Parsons 1995, p. 2-1). Results are summarized in Appendix B herein and are presented in the Site Investigation and Remediation Report, October 1995, prepared by Parsons

Engineering Science. Acetone was detected in 33 out of the 48 samples with eleven of the samples exceeding the NYSDEC Class GA groundwater standard of 50 ug/L (maximum of 1,500 ug/L) (Parsons Engineering Science, October 1995, p. 4-2). MIBK was detected in eleven of the 48 geoprobe groundwater samples with six samples exceeding 50 ug/L; no NYSDEC water quality standard exists for this parameter (Parsons Engineering Science, October 1995, p. 4-2). Methylene chloride was detected in eleven of the 48 geoprobe samples with ten samples exceeding the NYSDEC Class GA groundwater quality standard of 5 ug/L. The highest concentration of methylene chloride was detected in GP52 at 19,000,000 ug/L. Toluene was detected in 32 of the 48 geoprobe samples with four samples exceeding the NYSDEC Class GA groundwater quality standard of 5 ug/L. Tert-butanol was detected in only two samples. Isopropanol and methanol were each detected in only one sample at concentrations slightly above the detection limit. Dicyclohexylamine (DCHA) was detected in 13 of the geoprobe samples located primarily along Trunkline 5. Seven geoprobe samples exceeded 100 ug/L of DCHA with a maximum concentration of 1,600 ug/L (no groundwater quality standard exists). Ammonia was detected in all of the geoprobe groundwater samples at concentrations ranging from 0.18 mg/L to 129 mg/L. Due to the relining of all deteriorated sanitary sewer lines in the summer of 1995, Parsons Engineering Science (PES) concluded that the potential source of these compounds to groundwater has been eliminated and that the contaminants are not present at levels of environmental concern along the sanitary sewers (Parsons Engineering Science, October 1995, p. 4-3).

Buildings 1 and 4 Area

The Buildings 1 and 4 area was identified as a potential source area due to the age of the buildings (one of the oldest parts of the facility), the use of chemicals and the presence of deteriorated sewers nearby (Engineering-Science, November 1994, p. 2-22). The sanitary sewer system near Building 1 was suspected to be deteriorating. This information was

obtained from television inspections. Two geoprobe groundwater samples (GP35 and GP36) were collected along sanitary sewer Trunkline 1 in the Building 1 area to detect any chemical constituents that may be present in the surrounding soils and groundwater. Results of the geoprobes are included in Appendix B. Acetone was detected at 1,200 ug/L which was in exceedance of the groundwater guidance value of 50 ug/L and MIBK was detected at 250 ug/L but no guidance value was found. Parsons has stated that this suggests that acetone and MIBK are limited to a small area and are not migrating along the bedding material. It was concluded that contaminants are not present at levels of environmental concern in the Building 1 area (Parsons Engineering Science, October 1995, p. 5).

Similarly, the sanitary sewer system near Building 4 was suspected to be deteriorating as shown by television inspections. Four geoprobe groundwater samples (GP50, GP51, GP52, and GP53) were collected along sanitary sewer Trunkline 5 in the Building 4 area. Acetone was detected at 1,500 ug/L in sample GP50 exceeding the guidance value of 50 ug/L. Methylene chloride (7,700 ug/L) and MIBK (19,000 ug/L) were detected in GP51. At GP52, methylene chloride was detected at 18,000 ug/L and also in the resample at 19,000,000 ug/L, thus exceeding the groundwater standard of 5 ug/L. Based on this data (see Appendix B), three new monitoring wells were installed near GP52 to determine the amount of methylene chloride present in soil and groundwater in this area. After further investigation of data from groundwater and soil samples collected from the three new monitoring wells, it was determined that methylene chloride is located in a small area since it was not detected in these monitoring wells. Groundwater modeling was used to determine the future migration of methylene chloride. These results showed that the plume will reach a maximum distance of 200 feet from the source and will never reach the edge of the site due to degradation. According to Bristol, no remedial action needs to be taken because this area does not present an environmental concern (Parsons Engineering Science, October 1995, p. 5).

Buildings 9 and 24 Area

The Buildings 9 and 24 area was identified as a potential source area due to the age of the buildings, the use of chemicals, past spills, and the presence of deteriorated sewers nearby (Engineering-Science, November 1994, p. 2-23). Sampling of these areas was conducted to examine contaminants present in the soil or groundwater. Five geoprobe groundwater samples (GP49, GP55 to GP58) were collected along sanitary sewer Trunkline 5 in the Buildings 9 and 24 area. Results are included in Appendix B. Acetone and MIBK were detected in GP55, which was located on the northern side of the sewer line from Building 9. However, MIBK was not detected in the sample adjacent to GP55 and only a low level of acetone was detected at this location. No VOCs were detected in samples located closest to Building 9 although acetone, MIBK, and DCHA were detected in one isolated sample along Trunkline 5 but not in any adjacent samples. All deteriorated sewer lines have been re-lined since this sampling occurred, possibly eliminating the potential source of the detected chemicals. Parsons Engineering Science concluded that no remedial action needs to be taken since pollutants are not present at levels of environmental concern in this area (Parsons Engineering, October 1995, p. 6).

ST Tank Farm

The ST Tank Farm shown on Figure 3 is located south of Building 1 and consists of "six tanks, ST-7 through ST-11 which were installed in a concrete vault in 1961" (Engineering-Science, November 1994, p. 2-24). The concrete vault is enclosed on all four sides and the bottom and drains into the sanitary sewer. The tanks within the vaulted area contain acetone, butanol, MIBK, and potassium acetate. Television inspections showed deterioration in sanitary sewer lines north of the ST Tank Farm. In addition, a former tanker truck unloading area was located adjacent to the tank farm. Sampling was conducted in this area to examine

any possible leaks into groundwater from the sanitary sewer lines or from the tanker unloading area. Two groundwater samples, GP39 and GP40, were collected along a section of the sewer downgradient of the ST Tank Farm and the tanker unloading area. Acetone (67 ug/L) and MIBK (260 ug/L) were detected in GP40 but were not detected in the adjacent sample. Low concentrations of DCHA were detected in both samples. Butanol, isopropanol, methanol, and DMA were not detected in either sample (see Appendix B for geoprobe sampling results).

Because the tanks are enclosed in a concrete vault, any leakage would be directed to the Building 4B sewer for solvent recovery, therefore Parsons Engineering Science concluded this does not present an environmental concern. Also, since acetone and MIBK were detected in only one sample along the sewer line, but not in the adjacent samples, it was concluded that VOCs are limited to only a small area and are not migrating along the bedding material (Parsons Engineering Science, October 1995, p. 4-9).

Upper Main Tank Farm

The Upper Main Tank Farm shown on Figure 3 is located between Buildings 8 and 9 and consists of above-ground tanks which store lard oil, butanol, MIBK, methanol, acid and caustics. Prior to the tank farm upgrade (installation of 16 new tanks and concrete secondary containment dikes) in 1991, O'Brien & Gere conducted a soil gas survey within the tank farm area. The soil gas readings ranged from non-detect to 18 ppm. One to two feet of soil was removed for construction purposes and was monitored by Bristol staff with an HNU meter for the evolution of organic vapors. All readings were below the action level of 5 ppm and no solvent odors were detected. Additional information on soil or groundwater sampling was not provided (Engineering-Science, November 1994, pp. 2-13 to 2-14).

Lower Main Tank Farm

The Lower Main Tank Farm, located adjacent to the Upper Main Tank Farm, consisted of 13 underground tanks which were used for the storage of butanol, methanol, and acetone and one tank was used for 90-day hazardous waste storage of MIBK, acetone, butanol, methanol, isopropanol, methylene chloride, water and small quantities of other solvents. The tank farm was closed in December 1989 in accordance with a NYSDEC-approved closure plan. As part of the closure plan, six monitoring wells were installed downgradient of the tank farm (LMTF-1M and 1T, LMTF-2M and 2T, and LMTF-3M and 3T, see Figure 4) and monitored from December 1989 to December 1990 (four sampling events) (see Appendix B). Tert-butanol was consistently detected at concentrations above the Class GA groundwater standard of 50 ug/L (maximum concentration of 704 ug/L at LMTF-1T). MIBK was detected at low concentrations (up to 25 ug/L) below the groundwater quality standard. Methanol, methylene chloride and acetone were not detected in the groundwater samples (Engineering-Science, November 1994, p. 2-14).

The T-47 sump was located in the yard area of the Lower Main Tank Farm and consisted of a concrete manhole (approximately 2.1 feet in diameter and 12.5 feet deep) which was often observed with standing water. Closure activities, performed on August 19, 1994, consisted of soil and standing water removal. The sump was then completely filled with concrete. It was indicated that "analytical results of the water are pending and will be submitted as part of the T-47 closure report" (Engineering-Science, November 1994, p. 2-15). The T-47 closure report was not provided.

CHT Tank Farm

The CHT Tank Farm, shown on Figure 3, was located southeast of Building 9. The tank farm contained six tanks that were located in a concrete vault and were used to store methanol, methylene chloride and MIBK (Closure Report for the Vacuum Extraction System, Parsons Engineering Science, Inc., June 1997, p. 1-1). The vault was filled with gravel and drained to the sanitary sewer. The tanks were taken out of service as a result of the June 6, 1988 leak of methanol and methylene chloride to the sanitary sewer system (Engineering-Science, November 1994, p. 2-12).

The sampling effort mentioned in the Site Contamination Study Report consisted of three soil samples taken from well CH-2T (see Figure 4) in 1990 and two rounds of groundwater samples in February and August of 1990. Methylene chloride was detected in soil samples at concentrations of 1.1 mg/kg, 3.9 mg/kg and 108 mg/kg and in groundwater samples at concentrations of 13,200 mg/L and 13,400 mg/L (class GA groundwater standard of 5 ug/L). MIBK was detected in soil samples at concentrations of .01 mg/kg and 0.042 mg/kg but was not detected in groundwater samples. Methanol was not detected in the soil samples but was detected in groundwater samples at concentrations (1.5 mg/L and 2.8 mg/L) greater than the Class GA standard of 50 ug/L (Site Contamination Study Report, November 1994, p. 2-12).

A vacuum extraction system (VES) was installed in August 1991 to treat VOCs in soil gas and groundwater. After modifications to the system, the VES system began long-term operation in April 1992 and was turned off in November 1995 in preparation of permanent closure. The system operated for a total of 17,853 hours and recovered approximately 1,265 pounds of methylene chloride from soil gas and groundwater. In April 1996, methylene chloride was detected in groundwater at concentrations ranging from 21 mg/L to 610 mg/L, still above the Class GA standard. Parsons Engineering Science stated that groundwater

modeling indicates that "methylene chloride is expected to degrade as it migrates from the source area to a concentration of less than 0.1 mg/L at 150 feet from the source . . . and will never reach the edge of the site" (Closure Report for the Vacuum Extraction System, June 1997). This information was the basis for Bristol's request for permanent closure of the VES system. According to Bristol's Mailing No. 3 (dated June 16, 1997), "the closure report has been recently completed and will be submitted to Region 7 who have been monitoring this matter." It is not known at this time if NYSDEC accepted the closure request.

Former Drum Storage Area 1

Former Drum Storage Area 1, shown on Figure 3, was located just east of Building 9 and contained chemicals such as methylene chloride, MIBK, acetone, methanol, isopropanol, and toluene stored in drums vertically in rows on the ground surface. Two monitoring wells, CH-5TS and CH-5TD, are located within this storage area. Chloride, methanol, and MIBK were not detected in groundwater samples from these wells. Parsons Engineering Science concluded that contaminants do not appear to be present at levels of environmental concern (Parsons Engineering Science, October 1995).

Former Drum Storage Area 2

Former Drum Storage Area 2, shown on Figure 3, was located south of Building 7 and was used to store drums of methylene chloride, MIBK, acetone, methanol, isopropanol, and toluene before use in the production process. Historical photographs show the drums being stored vertically or lying down on their sides (Parsons Engineering Science, pp. 4-9). Two geoprobe groundwater samples (GP29 and GP30) were collected in this former drum storage area. Low levels of acetone (7.1-14 ug/L) and trace levels at or below the detection limit of toluene (0.4-0.6 ug/L) were detected in both samples. These levels were well below the

NYSDEC Class GA groundwater standards of 50 ug/L for acetone and 5 ug/L for toluene. Parsons Engineering Science concluded that the Former Drum Storage Area 2 is not an environmental concern (Parsons Engineering Science, pp. 4-10).

Former Drum Storage Area 3

Former Drum Storage Area 3, shown on Figure 3, was located north of Building 6A between the main Conrail Railroad tracks and the railroad spur. This area contained drums that consisted of methylene chloride, MIBK, acetone, methanol, isopropanol, and toluene. Two geoprobe groundwater samples (GP19 and GP20) were collected from this area. Results (see Appendix B) indicated that acetone, methylene chloride, and toluene were present at levels below the NYSDEC Class GA groundwater standards in sample GP19. However, methylene chloride was detected in sample GP20 at a concentration (33 ug/L) above the groundwater quality standard (5 ug/L). Parsons Engineering Science concluded that these pollutants do not exist at concentrations of environmental concern (Parsons Engineering Science, October 1995, p. 4-10).

Former Drum Storage Area 4

Former Drum Storage Area 4, shown on Figure 3, was located east of Building 6. In 1966, Building 32 was constructed over a majority of this area. Drums containing methylene chloride, MIBK, acetone, methanol, isopropanol and toluene were stored in this area prior to their use in the production process. Historical photographs indicate that the drums were stored in rows on the ground surface. A monitoring well cluster (PW-4F, 4T, 4LD, and 4LS) is located 50 feet downgradient of this former storage area. Eight sets of groundwater samples have been collected as part of the perimeter monitoring program. Methanol was detected in one sample at a concentration of 990 ug/L. One geoprobe sample (GP15) was

collected from this area and results indicated the absence of VOCs, DCHA, and DMA. Parsons Engineering Science concluded that contaminants are not present at levels of environmental concern (Parsons Engineering Science, October 1995, p. 4-10).

Former Drum Storage Area 5

Former Drum Storage Area 5, shown on Figure 3, was located southeast of Building 32A. In 1998, Buildings 63, 64, and 65 were constructed over this area. Drums stored on the ground surface in this area contained methylene chloride, MIBK, acetone, methanol, isopropanol, and toluene. A monitoring well cluster (PW-6F, 6T, and 6L) is located 50 feet downgradient of this former storage area. Several sets of groundwater samples have been collected from these wells indicating the presence of VOCs in low concentrations. During excavations of Building 32A, broken glass bottles, fiber drums, debris, and gold colored soil were discovered in a small area. Two soil samples collected for analysis of this area indicated the presence of two PAHs, fluoranthene and anthracene. Two geoprobe groundwater samples (GP03 and GP16) were collected near the sewer bedding of storm sewer Outfalls 007 and 008. GP01 was collected within the smaller storage area itself. Results (see Appendix B) showed the presence of acetone and toluene at GP03 and GP16 in concentrations below the NYSDEC Class GA groundwater quality standards for acetone (50 ug/L) and for toluene (5 ug/L). GP01 exhibited low concentrations of acetone, MIBK, and toluene. These results indicated no environmental concern since all detected levels were below the standards (Parsons Engineering Science, October 1995, p. 4-11).

Building 18 Fuel Oil USTs

Six oil storage tanks were located in the area near Building 18. Four storage tanks were located underground directly adjacent to Building 18. Two additional oil storage tanks, Tank

Oil-1 and Tank Oil-2, were located between Buildings 18 and 2C. All storage tanks contained Number 6 fuel oil. During upgrades of Tank Oil-2, impacted soils from oil leaks were encountered and analyzed. Hydrocarbon odors and droplets of free product on the temporary well screen were detected. Additional samples using geoprobes (GP42, GP46, GP47, and GP48) were analyzed for pollutants present in groundwater and soil. Results are shown in Appendix B. Sampling at GP47, located downgradient of Tank Oil-1, detected the presence of hydrocarbon odors and droplets of a free product. Sampling at GP42, located downgradient of Tank Oil-2, detected a small amount of hydrocarbon odors. Toluene was detected at a low concentration in GP46 and six SVOCs were detected in sample GP42 at concentrations below the NYSDEC Class GA groundwater standards (Parsons Engineering Science, October 1995, p. 4-13). It was indicated that no volatile or semivolatile fractions were detected in associated groundwater samples suggesting that Number 6 fuel oil is only present in soil and groundwater in a small area near Tank Oil-1 and Oil-2. Number 6 fuel oil is a high viscosity oil and is not expected to migrate from the source area or off-site. It was concluded that this area is not of environmental concern (Parsons Engineering Science, October 1995, p. 4-13).

Former Coal Pile

The former coal pile was located in the area just east of Building 2 as shown on Figure 3. Buildings 15B and 42 are presently located in this area. Two perimeter monitoring wells (PW-2M and PW-2T) are located in the former coal pile area (see Figure 4). Seven rounds of groundwater samples collected from these wells indicated low levels of 1,2-dichlorobenzene and 1,1-dichloroethane. Additional sampling from these wells was conducted to examine the presence of SVOCs. A groundwater sample was collected from well PW-2T but a sample could not be collected from PW-2M because the well was dry. The results (see Appendix B) show that 1,2-dichlorobenzene was detected (19, 28, and 120

ug/L) above the NYSDEC Class GA groundwater standard (3 ug/L). Bis(2-ethylhexyl)phthalate was detected at low concentrations and no other SVOCs were detected. The pH of the coal pile was in the normal range of 6.86 and it was concluded that the data indicate the former coal pile has not impacted the groundwater in this area. 1,2-Dichlorobenzene was not detected in any other wells on site and its source is unknown since this chemical was reportedly not used on site. It was concluded that the presence of 1,2-dichlorobenzene does not present an environmental concern since soils in this area have a low permeability and groundwater is not used in the vicinity of the site (Parsons Engineering Science, October 1995, p. 4-14).

Site-wide Groundwater Summary

The August 1992 sampling event detected sulfate at levels in excess of the New York State Class GA groundwater quality standard (250 mg/L) in PW-2T (820 mg/L), 3T (1800 mg/L), and 4T (590 mg/L). There were no VOCs or EPA Method 8015 parameters (i.e., butanol, methanol, isopropanol, DCHA and DMA) detected at these monitoring wells (OB&G, p. 19).

The August 1993 sampling event included several additional monitoring wells. Total phenols and sulfates were detected at levels in excess of the Class GA groundwater standards. There were no VOCs or EPA Method 8015 parameters detected at these monitoring wells (OB&G, p. 20).

The October 1993 sampling event included the same perimeter monitoring wells as the August 1993 sampling event and detected methanol (in PW-4LS at 990 ug/L) and sulfate (OB&G, p. 22). Sulfate was detected in six monitoring wells at concentrations (400 mg/L to 1,900 mg/L) in excess of the standard. There were no VOCs or EPA Method 8015 parameters detected at these monitoring wells (OB&G, p. 21).

Only one surface water sampling event (two samples) in the South Branch of Ley Creek was conducted during the various investigations at the Thompson Road facility. Acetone was detected in both samples.

West Taylor Street Facility

No analytical data were provided to assess the extent of the contamination, if any. As the period of operation was over 50 years ago, and was for a brief period, the threat of a release, while unknown, is limited.

Molloy Road Facility

No analytical data were provided to assess the extent of the contamination, if any. Bristol operated at the site during the 1980s and the threat of a release from past operations, e.g., spills, is unknown due to lack of information.

Warehouses

According to Bristol, only the Park Street Freezer and the Gleason Warehouse are currently used. The threat of a release from past operations, e.g., spills, is unknown due to lack of information.

4.2.2 Migration Potential of Contaminants

Bristol provided information on two sampling events at the Class 3 inactive landfill. The soil is contaminated with VOCs (methylene chloride, 1,2-DCE and TCE, with the highest concentrations in the southern corner of the site, adjacent to the South Branch of Ley Creek

and the property boundary), SVOCs, pesticides and PCBs. The VOCs and many of the SVOCs exceeded the New York State recommended soil cleanup objectives. Although the test pits indicate that the groundwater flow is beneath the burning pit refuse, the potential for landfill leachate to contaminate the native soil and groundwater remains. Of particular concern is the presence of chlorinated solvents (1,1-DCA and 1,1,1-TCA) which are very mobile and have already migrated to the eastern property boundary at concentrations exceeding groundwater standards. These contaminants will continue to migrate east as groundwater flow is in that direction. In addition, concentrations of 1,1-DCA above the groundwater standard have been detected upgradient of two suspected burning pits and approximately 60 feet from the South Branch of Ley Creek.

Bristol provided information on numerous groundwater sampling events (from 1989 to 1995) at locations near the perimeter of the site adjacent to the South Branch of Ley Creek and Headson's Brook. The locations and analytical data for the perimeter monitoring wells at the Thompson Road facility are presented on Figure 3 and Appendix B, respectively. At monitoring wells (the PW6 cluster) located less than 150 feet upgradient of the South Branch of Ley Creek, sulfate, ammonia, 1,2-DCA, 1,1,1-TCA and total phenols were all detected at concentrations greater than state groundwater standards. Thus, the potential exists for contaminants to migrate from the Thompson Road facility to the South Branch of Ley Creek via groundwater. The potential for migration of contaminants off-site also exists at the northern boundary of the site where 1,2-dichlorobenzene, sulfate and total phenols have consistently exceeded state groundwater standards.

In OB&G's January 1994 Storm Sewer Contaminant Source Investigation report, it is stated that the flow of site-related constituents would most likely be within the shallow groundwater zone. The report presented an average hydraulic conductivity value of 0.03 feet per day and

a hydraulic gradient of approximately 0.05 feet per foot for the shallow mixed deposits. It was estimated that 81.5 gallons per day of groundwater flow off-site (OB&G, p. 12).

Two "notch well" nests were installed and sampled along storm sewer Outfalls 003 (MW-35-1, MW-35-2, MW-35-3) and 007 (MW-77-1, MW-77-2, MW-77-3) because these lines convey significant quantities of process flows and were identified as deteriorating. The "notch wells" were placed in between the bedding material of the storm and sanitary sewers (OB&G, p. 20). In October 1993, MIBK (in MW-77-1 at 16 ug/L), acetone (in MW-77-2 at 190 ug/L), and sulfate (in MW-35-1 and all three MW-77 wells at a maximum concentration of 420 mg/L) were detected in groundwater samples. Although it was reported that the "bedding material does not appear to be a preferential pathway for contaminant migration" (Parsons, 1995, p. 4-3), it is likely that the deteriorated sanitary sewers have been leaking wastewater into the deteriorated storm sewer lines and ultimately into the South Branch of Ley Creek and Headson's Brook for some time.

Due to the numerous spills and releases to the South Branch of Ley Creek and Headson's Brook, the potential also exists for the presence of contaminants in the sediment of the two creeks. Sediment data were not provided by Bristol Myers.

Bristol did not provide any air, soil, groundwater or surface water sampling data for the other facilities and warehouses.

NYSDEC Sediment Sampling of the South Branch of Ley Creek

Sediment was sampled in the South Branch of Ley Creek by NYSDEC in November 1996 and in October 1997. Sediment samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) and

inorganics (metals). Approximate sample locations are shown on Figure 6 as well as the approximate limits of the Bristol Myers Thompson Road site. Analytical data for the samples collected near the site were retrieved from the NYSDEC/TAMS Onondaga Lake Data Management System and are tabulated in Appendix C of this report. A summary of the data is provided below.

Analyses of metals, VOCs, SVOCs and PCBs in sediment were examined in six samples collected in the vicinity of the Thompson Road site including five samples in the South Branch of Ley Creek and one sample (S-108) in Headson's Brook, located along the northern perimeter of the Bristol property. Of the five samples collected in the South Branch of Ley Creek, one sample (S-110) was collected upstream of the site and upstream of Burnet Avenue, one sample (L-27) was collected near the upstream limit of the site but downstream of Burnet Avenue, one sample (S-109) was collected near the downstream limit of the site, and two samples (L-26 and S-107) were collected farther downstream (see Figure 6). Sediment samples L-26 and L-27 were collected by NYSDEC in 1996. Samples S-107, S-108, S-109, and S-110 were collected by NYSDEC in 1997. The descriptions of the sample locations based on NYSDEC's field notes are included in the tables in Appendix C.

While there are no set sediment standards for metals, levels of risk (Lowest Effect Level and Severe Effect Level) have been compiled by NYSDEC's Division of Fish, Wildlife and Marine Resources for the purpose of screening contaminated sediments (NYSDEC, 1999). Sediments are classified as severely contaminated or moderately contaminated based on the concentrations required to produce adverse ecological effects. Sediments are considered "moderately contaminated" if the concentration exceeds the Lowest Effect Level (LEL) but is below the Severe Effect Level (SEL) and "severely contaminated" if the concentration is greater than the SEL. The metals data from the six samples and the NYSDEC screening criteria based on levels of risk are included in Table C-1 of Appendix C.

Based on the metals data, many of the stations can be considered moderately contaminated. Concentrations of lead exceeded the SEL at two stations (one station upstream [S-110] and one station adjacent [L-27] to the site). Concentrations of zinc also exceeded the SEL at two stations (one upstream [S-110] and one downstream [L-26]). Sample station S-110, located approximately 400 feet upstream of the Bristol Myers site, upstream of Burnet Avenue, and behind the East Syracuse Cogeneration Plant, is moderately contaminated with cadmium, chromium, copper, manganese, mercury and nickel. It appears that metal concentrations decrease from station S-110 to L-27, which is located adjacent to the Bristol Myers Thompson Road site and downstream of Burnet Avenue, except for barium and calcium which increased between these two locations. Concentrations of metals appear to both increase and decrease from station L-27 to station S-109, which is located at the northern limit of the Bristol Myers site, just upstream of the confluence with Headson's Brook. Concentrations of aluminum, arsenic, beryllium, chromium, cobalt, iron, mercury, nickel, potassium, and vanadium slightly increased in the downstream direction from L-27 to S-109 whereas concentrations of barium, cadmium, calcium, copper, lead, magnesium, manganese, sodium, and zinc decreased in the downstream direction. Station S-108 is located within Headson's Brook. This ditch flows east until its confluence with the South Branch of Ley Creek. This station did not exhibit any severe contamination, however, this station was moderately contaminated with arsenic, cadmium, and copper. Concentrations of many of the metals at sampling stations within the site boundary (S-109 and L-27) and within Headson's Brook (S-108) were either less than the LEL or between the LEL and SEL.

Stations L-26 and S-107 are located in the South Branch of Ley Creek, downstream of the Bristol Myers Thompson Road site. Sediment samples collected at these locations are not severely contaminated by metals except for zinc at station L-26. Concentrations of many of the metals were either less than or only slightly greater downstream of the site (L-26 and S-107) than adjacent to the site (S-108 and S-109). However, copper concentrations at L-26

(42 ppm) and S-107 (73.8 ppm) were greater than the upstream copper concentration of 23.2 ppm at location S-108 (within Headson's Brook). Copper concentrations increased in the downstream direction, between L-26 and S-107, indicating a possible source downstream of the Bristol Myers site. Concentrations of barium and zinc also increased from S-108 to L-26. Stations L-26 and S-107 both exhibited moderate contamination by cadmium, copper, lead and nickel. Station L-26 is also moderately contaminated by chromium and severely contaminated by zinc. The estimated zinc concentration (811 ppm) at station L-26 is more than twice the concentrations at the other five stations (ranging from 54.8 ppm to 303 ppm).

In summary, concentrations of inorganics (metals) at the two surface sediment stations (S-109 and S-108) directly adjacent to the Bristol Myers Thompson Road site near its downstream limits do not indicate that this site is a significant recent source of metals to the South Branch of Ley Creek.

Organic compounds (VOCs, SVOCs, and PCBs) were also analyzed in these six surface sediment samples near the Bristol Myers site. The VOC, SVOC, and PCB data are included in Tables C-2, C-3, and C-4 in Appendix C, respectively. The NYSDEC sediment screening criteria (NYSDEC, 1999) are also included in these tables. For many of the organic compounds, the NYSDEC screening criteria are based on the protection of benthic aquatic life chronic toxicity, wildlife bioaccumulation values, and/or human health bioaccumulation values. In each case, the screening criteria are provided on an organic carbon basis (i.e., ug chemical/g organic carbon). Since total organic carbon (TOC) was measured in the four samples collected in 1997 (ranging from 4.4% to 7.1%), the screening criteria included in the tables in Appendix C were adjusted to a dry-weight basis using the station-specific TOC. For the two stations sampled in 1996 where TOC was not analyzed, the lowest TOC value (4.4%) from the four nearby 1997 samples was used to adjust the screening criteria for stations L-26 and L-27.

Most of the VOCs were not detected in the sediment samples (see Table C-2 in Appendix C). The concentrations of the VOCs that were detected were less than the NYSDEC sediment screening criteria, if available, adjusted for TOC. Detected VOCs include: chloromethane, acetone, carbon disulfide, 2-butanone (MEK), and chlorobenzene. Acetone, 2-butanone (MEK), and chlorobenzene were detected at station S-110, located upstream of the Bristol Myers Thompson Road site at concentrations of 67 ppb, 26 ppb, and 12 ppb, respectively. Acetone, carbon disulfide, and 2-butanone were detected at location L-27, which is situated adjacent to the Bristol Myers site near its upstream limits. Concentrations of acetone and 2-butanone were less at station L-27 compared to station S-110. Directly downstream near the northern limit of the Bristol Myers Thompson Road site, at station S-109, acetone and 2-butanone were detected at slightly higher concentrations. Chloromethane was detected in Headson's Brook (station S-108). Acetone and carbon disulfide were detected at low concentrations at the downstream stations (L-26 and S-107). It should be noted that some of the other volatile contaminants of concern (MIBK or 4-methyl 2-pentanone, methylene chloride, TCA and DCA) at the Thompson Road site were not detected in these six surface sediment samples collected by NYSDEC.

SVOCs that were detected consisted mostly of polycyclic aromatic hydrocarbons (PAHs), such as benzo(a)anthracene, fluorene, anthracene, fluoranthene, phenanthrene, acenaphthene, naphthalene, pyrene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene (see Table C-3 in Appendix C). The following PAHs exceeded NYSDEC screening criteria at all locations: benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene (except for station L-27 where it was not detected), benzo(a)pyrene, and indeno(1,2,3-cd)pyrene. Generally, concentrations of these PAHs increased from station S-110 (upstream of Bristol Myers) to station L-27 (adjacent to Bristol Myers), and then decreased from station L-27 to stations S-109 and S-108.

Concentrations of many of these PAHs then increased at station L-26 and then decreased again at station S-107 (located the farthest downstream from the Bristol Myers site). Since the initial increase in PAH concentrations was detected between the station upstream of the site (S-110) and the station adjacent to the site (L-27) and PAH concentrations then generally decreased from this station, it appears that a source of PAHs possibly exists either slightly upstream of the Bristol Myers site or from the Bristol Myers site between Burnet Avenue and station L-27 which is about 200 feet downstream of Burnet Avenue. An increase in PAHs was also detected between S-108 (within Headson's Brook) and L-26 (located downstream of station S-108 near Wegmans Plaza) which suggests a PAH source near the Wegmans Plaza area, downstream of the Bristol Myers site. Thus, sources of PAHs may exist upstream of the site, or at the southern portion of the Bristol Myers Thompson Road site, or downstream of the site.

PCB Aroclors were detected in each of the six surface sediment samples (see Table C-4 of Appendix C). Concentrations of PCB Aroclor 1254 exceeded the NYSDEC sediment screening criterion for total PCBs (1.4 ug/g-oc) at four of the six stations (S-110, L-27, S-109, and L-26). The concentrations of PCB Aroclors 1254 and 1260 are the highest at station S-110, located upstream of the Bristol Myers site, and subsequently decrease in concentration down to station S-108. PCB Aroclor 1254 concentrations then increase to 96 ppb at station L-26 and decrease at station S-107. Thus, the low levels of PCBs present in the sediment samples likely originated from a source upstream of the Bristol Myers Thompson Road site.

5.0 POTENTIAL FOR ADVERSE IMPACTS TO LAKE SYSTEM DUE TO A RELEASE OR THREAT OF A RELEASE

5.1 Hazardous Substance Characteristics

The primary contaminants of concern at the Thompson Road site include acetone, MIBK, methylene chloride, 1,1-dichloroethane (DCA), 1,1,1-trichloroethane (TCA) and polycyclic aromatic hydrocarbons (PAHs). Other contaminants have been identified to a lesser extent including 1,2 dichlorobenzene, 1,2-DCA, trichloroethene (TCE), sulfate, total phenols, and ammonia. The sources of contamination identified during the various investigations at the Thompson Road site include spills, on-site disposal of hazardous wastes, discharges of industrial wastewater to the storm and sanitary sewers and unpermitted releases to the atmosphere and surface water. These sources have resulted in contamination of soil, groundwater, surface water, and possibly sediment in the South Branch of Ley Creek. Contaminants of concern have not been identified for the other Bristol facilities since environmental data were not provided.

Mobility

Acetone, a volatile organic compound (VOC), has a high vapor pressure and is readily removed from the atmosphere by wet deposition. The solubility of acetone in water is high, giving this material a high mobility. Acetone is expected to leach into groundwater and quickly evaporate. Acetone readily biodegrades in soil and water and may be moderately degraded in the atmosphere (M. Baker, 1998).

Methyl isobutyl ketone (MIBK), also a VOC, is moderately soluble in water. This material evaporates moderately when released into soil or water. Methyl isobutyl ketone is expected

to leach into groundwater when released into soil. Methyl isobutyl ketone is expected to be readily degraded in air by photolysis and moderately degraded in soil (M. Baker, 1996).

Methylene chloride, also a VOC, has a high vapor pressure and therefore, rapidly volatilizes into the atmosphere where reaction with hydroxyl radicals occurs. In surface water, dissolved methylene chloride will undergo slow hydrolysis and will rapidly volatilize to the atmosphere. Methylene chloride is highly mobile in soils due to a low soil organic partitioning coefficient and is expected to leach from soils to groundwater. There is some evidence that biodegradation can be an important fate mechanism for methylene chloride in water (ATSDR, 1992).

1,1-Dichloroethane and 1,1,1-trichloroethane, also VOCs, rapidly volatilize into the atmosphere where photooxidation produces hydrochloric acid, carbon monoxide, carbon dioxide and carboxylic acid. In surface waters, these compounds will rapidly volatilize into the atmosphere where photooxidation will occur. In soil, they are considered very mobile under most subsurface conditions and will readily leach into groundwater. Chlorinated solvents, such as 1,1-dichloroethane and 1,1,1-trichloroethane, are considered to be relatively soluble in water giving these compounds a high mobility as well.

Polycyclic aromatic hydrocarbons typically have relatively low mobilities. These compounds are usually categorized as dense non-aqueous phase liquids (DNAPLs) and will migrate down through the soil column and pool at aquitards or bedrock surfaces. Solubilities for PAHs decrease rapidly as the number of benzene rings increases. Fluoranthene, with three rings is relatively insoluble (0.265 mg/L) (Verschueren, 1983). Benzo(a)anthracene, with four rings, is insoluble (0.009 - 0.014 mg/L) and chrysene, also with four rings, is insoluble (0.0015 - 0.0022 mg/L) (ATSDR, 1988). PAHs have high adsorption coefficients and will adsorb onto sediment particles, especially organic matter, so that sediment transport is an

important fate process for these compounds. There is some evidence that photooxidation can be an important fate mechanism for PAHs. However, the process may be inhibited by adsorption onto organic matter so that in waters with high suspended matter contents, e.g., eutrophic waters, the relative importance of photooxidation as a fate mechanism is dependent on the environmental conditions (USEPA, 1979).

Toxicity

No data is available that would suggest that acetone is a carcinogen (Verschueren, 1983). Acetone is not expected to be toxic to aquatic organisms. Acetone may affect the respiratory tract and central nervous system via inhalation or ingestion (M. Baker, 1998).

No data is available on carcinogenicity for methyl isobutyl ketone (Verschueren, 1983). Methyl isobutyl ketone is not expected to be toxic to terrestrial organisms. Methyl isobutyl ketone may affect the central nervous system, liver and kidneys via inhalation (M. Baker, 1996).

Methylene chloride is a possible human carcinogen. This determination is based upon inadequate evidence in humans and evidence of carcinogenity in lab animals. Acute exposure to methylene chloride via inhalation can result in adverse impacts to the central nervous system in humans and animals. Methylene chloride toxicity studies in humans reveal that the nervous system is a primary target and adverse human health effects include a decrease in behavioral and psychomotor performance. There is evidence that intermediate exposure to methylene chloride results in liver effects in humans and animals. Chronic-concentration exposure results in liver effects in animals via inhalation or oral exposure to methylene chloride, but no data are available on adverse health effects in humans (ATSDR, 1992).

According to USEPA, 1,1-dichloroethane is a possible human carcinogen (IRIS, 1997). This determination is based upon no human data and limited evidence of carcinogenicity in lab animals. Acute exposure to high levels of 1,1,1-trichloroethane can be lethal to humans and animals, usually the result of respiratory or cardiac failure. However, long-term exposure at low to moderate concentrations has no apparent effect on animal mortality, while long-term exposure to high concentrations of 1,1,1-trichloroethane vapor can have lasting toxic effects on the human heart (ATSDR, 1990). Also, the available data are inconclusive as to the carcinogenic potential of the chemical in animals and humans and is thus not classified as carcinogenic (IRIS, 1997).

The PAHs, chrysene and benzo(a)anthracene, each have four aromatic rings and fluoranthene has three aromatic rings. Chrysene is a carcinogen in animals following long-term dermal application. However, there are no studies correlating human chrysene exposure and tumor development, although there are numerous studies indicating human cancer from exposure to mixture of PAHs that include chrysene (ATSDR, 1988). Chrysene is classified as a probable human carcinogen based on animal bioassays (IRIS, 1997). PAHs, including chrysene, accumulate in the sediment of water bodies and in aquatic organisms. Similar to chrysene, benzo(a)anthracene is an experimental carcinogen by the dermal route of exposure. There is also some evidence that benzo(a)anthracene is carcinogenic by the oral route as well (ATSDR, 1988). Limited data exist for fluoranthene, which is a questionable human carcinogen (Lewis, 1992).

Persistence

In surface waters and surficial soils, VOCs (including acetone, methyl isobutyl ketone, methylene chloride, 1,1-dichloroethane and 1,1,1-trichloroethane) will predominantly volatilize into the atmosphere where they rapidly degrade. In subsurface soils where

volatilization does not readily occur, VOCs are much more persistent. VOCs will also leach from soils into groundwater. Once in groundwater, VOCs will not readily volatilize and are relatively persistent.

Semi-volatile organic compounds, particularly the longer-ringed PAHs such as benzo(a)anthracene and chrysene, are relatively persistent in the environment. The dissolved fraction of SVOCs can undergo rapid photolysis in surface waters. However, the strong adsorption characteristics tend to inhibit photolysis. In groundwater, SVOCs are persistent.

Bioaccumulation

Acetone and methyl isobutyl ketone are not expected to bioaccumulate in organisms significantly (M. Baker, 1998 and 1996).

Bioaccumulation of methylene chloride in organisms has not been measured. Methylene chloride is not known to bioconcentrate in fish and aquatic organisms and is not expected to biomagnify in the food chain (ATSDR, 1992).

Bioaccumulation is not an important process for 1,1-dichloroethane and 1,1,1-trichloroethane in the aquatic environment (USEPA, 1979). 1,1,1-Trichloroethane is not known to bioconcentrate in fish and aquatic organisms and is not expected to biomagnify in the food chain (ATSDR, 1990).

PAHs have shown rapid uptake rates in aquatic organisms from zooplankton to fish. PAHs with two to four rings are readily metabolized and excreted by organisms (USEPA, 1979).

5.2 Quantity of Substances

Thompson Road Facility

Laboratory wastes (of unknown volume) were dumped at the Class 3 inactive landfill, located on the eastern edge of the property, at the rate of about 100-200 vials per year. The bottles contained wastes such as acetone, peroxides, mineral oils, and spent lab chemicals. The wastes were periodically ignited and after burning out, covered over with soil.

Spills and releases of various contaminants (as discussed in Section 4 and Appendix A) occurred at the Thompson Road facility since the facility began operating in the 1940s. Spills and releases prior to the 1980s were not documented in Bristol's responses. Many of these spills were released to the sanitary sewer (the numerous NOVs are discussed in Section 4) as well as numerous releases to the storm sewer and directly to the South Brach of Ley Creek and Headson's Brook. In addition, due to the deteriorated state of the sanitary sewer and storm sewer piping, industrial wastewater was likely released to soils, groundwater and surface water, including the South Branch of Ley Creek and Headson's Brook for some time. Quantities of substances spilled and released to the environment are documented in prior sections of this report.

Molloy Road Facility

According to the OCDDS Industrial Wastewater Discharge Permit No. 21, the Molloy Road facility discharged its sanitary and industrial wastewater into the sanitary sewer flowing to the Ley Creek Treatment Plant (p. D0008929). Bristol stated that wastewater from formulation tank cleaning and excess product was discharged to the sanitary sewer.

Monitoring data and NOVs were not found in Bristol's response. No environmental data was provided for this facility.

Other Facilities and Warehouses

Quantities of substances released to the environment at the remaining facilities and warehouses were not indicated in Bristol's responses.

5.3 Levels of Contaminants

Soil and groundwater samples were collected and analyzed for select parameters at the Thompson Road facility and the inactive landfill. Limited surface water sampling data from the South Branch of Ley Creek were also provided. The data are summarized in Appendix B and a discussion is presented in Section 4.2. In summary, methylene chloride, acetone, 1,2-DCE, 1,1-DCA, and TCE were detected in soils at concentrations which exceeded recommended soil cleanup objectives. Acetone, 1,2-dichlorobenzene, 1,1-DCA, 1,2-DCA, 1,1,1-TCA, total phenols, sulfate, chlorobenzene, ammonia and tert-butanol were detected in groundwater at concentrations which exceeded groundwater standards and guidance values. Acetone was also detected in surface water of the South Branch of Ley Creek upstream and downstream of the inactive landfill at concentrations of 10 ug/L and 60 ug/L, respectively. Since elevated concentrations of contaminants have been detected in the groundwater less than 150 feet upgradient of the South Branch of Ley Creek, it is likely that contaminants have reached the South Branch of Ley Creek.

Sediment samples collected by NYSDEC in the South Branch of Ley Creek (one upstream, two adjacent, and two downstream of the site) and one in Headson's Brook (adjacent to the site), were analyzed for metals, VOCs, SVOCs, and PCBs. The data are summarized in

Appendix C and a discussion is presented in Section 4.2. Results of the sediment sampling indicate "severe contamination" by lead and zinc upstream of the Bristol Myers site, and "severe contamination" by zinc downstream of the site (i.e., concentrations above NYSDEC's Severe Effect Level). One station located adjacent to the Bristol Myers site, approximately 200 feet downstream of Burnet Avenue, was severely contaminated by lead, however the estimated lead concentration (134 ppm) only slightly exceeded the SEL (110 ppm). Based on these data, it was determined that the Bristol Myers site was not a significant recent source of metals to the South Branch of Ley Creek.

Sediment samples for VOCs and SVOCs exhibited detections of chloromethane, acetone, carbon disulfide, 2-butanone (MEK), chlorobenzene, 1,2-dichlorobenzene, 4-methylphenol, dibenzofuran, butylhexylphthalate, and many PAHs. However, only the following PAHs exceeded the screening criteria: fluorene, phenanthrene, anthracene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene. As discussed in Section 4.2, the data suggest that PAH sources may exist upstream or at the Bristol Myers Thompson Road site and possibly downstream of the site.

PCB Aroclors were detected in all six sediment sampling locations with concentrations of Aroclor 1254 exceeding the NYSDEC sediment screening criterion at four of the six sediment sampling locations. PCB concentrations were highest upstream of the Bristol Myers Thompson Road site suggesting a source of PCBs upstream of the site. Therefore, analysis of these six sediment samples, including one sample located within Headson's Brook and five samples in the South Branch of Ley Creek, suggests that the Bristol Myers Thompson Road site is not a significant recent source of PCBs to the South Branch of Ley Creek.

Environmental data were not provided for the remaining facilities and warehouses.

5.4 Impacts on Special Status Areas

Headson's Brook and the South Branch of Ley Creek adjacent to the Thompson Road site are class C waterbodies. As of August 1996, there was one New York State "Natural Heritage Sensitive Element" approximately one mile southwest of the site, south of I-690. It is unlikely that surficial contamination at the Thompson Road facility has impacted this area due to intervening topographic features. Federal wetlands exist within ½ mile of the site, including a palustrine, emergent marsh to the southwest; a palustrine, open water wetland to the southeast; and a palustrine, forested wetland to the northwest along the South Branch of Ley Creek. The federal wetland to the northwest is approximately ½ mile downstream of the Thompson Road facility. Since this wetland appears to be hydraulically connected to the South Branch of Ley Creek, it is possible that contamination from the Bristol site could have impacted this federal wetland. The federal wetlands to the southeast are also New York State freshwater wetlands, designated as SYE-19. The state and federal wetlands to the south have likely not been impacted by surficial contamination at the Thompson Road facility due to intervening topographic features.

For the remaining facilities and warehouses, a discussion of the presence of wetlands and natural sensitive elements is not provided herein as environmental data were not provided. The classifications of surface waters near these sites are provided in Section 3.2 of this report.

6.0 SUMMARY OF CONCERNS

Based on the information provided by Bristol and NYSDEC, the following concerns are noted:

- The Class 3 inactive landfill is not lined and there is no documented leachate collection/treatment system. Of particular concern is the presence of chlorinated solvents (1,1-DCA and 1,1,1-TCA) in groundwater at concentrations exceeding state standards in the vicinity of the landfill. These contaminants are highly mobile and have already migrated to the eastern property boundary. These contaminants will likely continue to migrate off-site to the east as groundwater flow is in that direction. In addition, concentrations of 1,1-DCA above the state groundwater standard were detected upgradient of two suspected burning pits and approximately 60 feet from the South Branch of Ley Creek. Additional concerns are the limited soil (eleven test pits at the 1.5-acre site) and groundwater data (two sampling events, only three monitoring wells).

- The Class 3 inactive landfill site drains to the South Branch of Ley Creek (shown on Figure 5) and this portion of the creek as well as portions of the site are located within the 100-year floodplain (BB&L, December 1992, p. 18). Erosion of the landfill soils and scour of the potentially-contaminated sediments in the creek during flood events could cause off-site migration of contaminants.

- Monitoring wells were not placed outside the Bristol property boundaries and were not placed in the location of two suspected burning pits (TP-5 and TP-11, shown on Figure 5) at the inactive landfill. Monitoring wells at these locations would assist in obtaining a better assessment of plume delineations and assessing the off-site migration of contaminants.

- The investigation of the sanitary sewer and storm sewer systems demonstrated that extensive deterioration and cross-connections of these systems existed at the Thompson Road facility. According to the information provided, Bristol did not begin to address this problem until the late 1970s. This likely resulted in years of unrecognized discharges to the storm sewer system which flows to the South Branch of Ley Creek and Headson's Brook as well as to groundwater. The facility has been operating since the 1940s and the storm sewer system was rehabilitated in 1992 and the sanitary sewer system was rehabilitated in 1995.

- Unregulated industrial wastewater was discharged to the storm sewers without a SPDES permit prior to 1992.

- The analytical surface water data provided are limited in terms of sampling events (only one in the South Branch of Ley Creek and none in Headson's Brook) and sample location (one sample slightly upstream of the landfill and one sample downstream of the landfill in the creek but upstream of Headson's Brook, see Figure 5).

- The surface sediment sampling conducted by NYSDEC during two separate sampling events (1996 and 1997) in the vicinity of the Bristol Myers Thompson Road site provided sediment data within Headson's Brook (one sample) and the South Branch of Ley Creek (five samples). Analysis of these samples suggests that the Bristol Myers Thompson Road site may be a source of PAHs into the South Branch of Ley Creek but not a significant source of inorganics, volatile organics, and PCBs into the sediments of the South Branch of Ley Creek.

- The vapor extraction system at the CHT Tank Farm was turned off in November 1995 in preparation of permanent closure. In April 1996, methylene chloride was detected in groundwater at 610 mg/L which exceeded the groundwater standard of 0.005 mg/L. It is not known at this time if NYSDEC Region 7 has accepted the closure report.

- Based on the nature of operations at the Molloy Road facility, it is possible that limited contamination may have occurred at this site. No analytical data were provided.

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TABLES

Table 1. Thompson Road Facility Building Identification

Bld No.	Year Building Const	Current Use	Past Use	Year Prop. Purch.	Property Purchased From
6	1919	Research and control	Same	1945	National Cellulose Corporation
12	1944	Out of Service (1986)	Corn syrup storage	1945	Reconstruction Finance Corporation
17	1944	Boiler house and compressor room	Same	1945	Reconstruction Finance Corporation
1	1945	Under renovation for penicillin extraction	Chemical production, pilot plants, labs & maintenance	1945	Reconstruction Finance Corporation
2	1945	Boiler house	Same	1945	Reconstruction Finance Corporation
3	1945	Dry product and mechanical storage area, labs	Same	1945	Reconstruction Finance Corporation
6 A	1945	Virology	Same	1945	National Cellulose Corporation
7	1945	Cafeteria	Maintenance garage 1919 – 1960	1945	National Cellulose Corporation
13	1945	Solvent pump house	Same	1945	Reconstruction Finance Corporation
4	1946	Extraction (penicillin)	Same	1945	Reconstruction Finance Corporation
2 A	1947	Boiler house	Same	1945	Reconstruction Finance Corporation
5	1957	Maintenance, laboratories, fermentation development	Same plus sterile filling	1945	Reconstruction Finance Corporation
8	1947	Fermentation production	Same	1945	Reconstruction Finance Corporation
9	1947	Extraction (Kanamycin & Splitting)	Same	1945	Frank J. Cregg, Jr.
14	1947	Electric substation	Same	1945	Reconstruction Finance Corporation
15	1947	Cooling tower pump house	Same	1945	Reconstruction Finance Corporation
20	1949	Dry raw material and product storage	Same	1945	National Cellulose Corporation
4 A	1951	Extraction (penicillin)	Same	1945	Reconstruction Finance Corporation
8 A	1951	Fermentation production	Same	1945	Reconstruction Finance Corporation
18	1951	Out of Service	Fuel oil storage (until 1986)	1945	Reconstruction Finance Corporation
8 B	1952	Fermentation production	Same	1945	Reconstruction Finance Corporation
8 C	1952	Fermentation production, utilities	Same	1945	Reconstruction Finance Corporation
15 A	1952	Tower water pump house	Same	1945	Reconstruction Finance Corporation
21	1952	QC laboratory/maintenance	Same plus sterile filling & packaging	1945	Reconstruction Finance Corporation
22	1952	Administration	Same	1945	Frank J. Cregg, Jr.
9 B	1953	Utilities, offices and labs	Same	1945	Frank J. Cregg, Jr.
9 A	1953	Extraction (Ceph Broth & Kanamycin)	Same	1945	Frank J. Cregg, Jr.
26	1953	Electric substation	Same	1945	National Cellulose Corporation
27	1953	Solvent recovery	Same	1945	Reconstruction Finance Corporation
35	1955	Administration	Same		Syracuse Bradford Corporation
28	1956	Materials control, receiving & traffic control	Same	1955	Thompson Road Realty Corporation
34	1956	Vehicle and electrical equipment storage	Same		Radcliff Construction Co., Inc.
23	1958	Laboratories	Same	1945	National Cellulose Corporation
29	1958	Warehouse–extraction–kanamycin	Same	1945	Frank J. Cregg, Jr.
30	1961	Solvent storage – research	Same	1945	National Cellulose Corporation
5 A	1962	40 PSIG centrif. air compressor, ferm. develop	Same	1945	Reconstruction Finance Corporation
24	1962	Chemical development & engineering	Same	1945	National Cellulose Corporation
24 A	1962	Chemical development pilot plant	Same	1945	National Cellulose Corporation
31	1963	Carpenter shop	Same	1945	Reconstruction Finance Corporation
8 D	1964	Fermentation development	Same	1945	Reconstruction Finance Corporation
19	1964	Yards & grounds	Same		Radcliff Construction Co., Inc.
2 B	1965	Boiler house	Same	1945	Reconstruction Finance Corporation
21 A	1965	Raw material & product dry storage/labs	Same plus sterile filling/packaging	1945	Reconstruction Finance Corporation

Table 1. Thompson Road Facility Building Identification

Bld No.	Year Building Const	Current Use	Past Use	Year Prop. Purch.	Property Purchased From
15 B	1966	Tower water pump house	Same	1945	Reconstruction Finance Corporation
22 A	1966	administration	Same	1945	Frank J. Cregg, Jr.
32	1966	Toxicology laboratories	Same	1948	Agnes G. Roberts
33	1966	Refrigeration (chilled water)	Same	1945	National Cellulose Corporation
4 B	1967	Extraction & chemical prod. (cephalosporin)	Same	1945	Reconstruction Finance Corporation
8 E	1967	Fermentation production	Same	1945	Reconstruction Finance Corporation
23 B	1967	Research Laboratories	Same	1945	National Cellulose Corporation
25	1967	Organic synthesis pilot plant	Same	1945	National Cellulose Corporation
25 A	1967	Dry storage for chemical development	Same	1945	Frank J. Cregg, Jr.
1 A	1968	Water treatment chemical storage (drums)	Drum solvent storage	1945	Reconstruction Finance Corporation
4 C	1968	Electrical for buildings 4 & 4A	Same	1945	Reconstruction Finance Corporation
23 A	1968	Research	Same	1945	National Cellulose Corporation
26 B	1968	Machine oil storage (drums)	Same	1945	National Cellulose Corporation
37	1968	Tower water pump house	Same	1945	Reconstruction Finance Corporation
4 D	1969	Service (brine chiller) for buildings 4 & 4A	Same	1945	Reconstruction Finance Corporation
36	1969	Utilities – chilled water and compressed air for ferment.	Same	1945	Reconstruction Finance Corporation
41	1969	Dry storage	Same	1945	Frank J. Cregg, Jr.
42	1969	Maintenance	Same	1945	Reconstruction Finance Corporation
38	1970	Refrigeration for splitting	Same	1945	Frank J. Cregg, Jr.
40	1970	Ethylene gylcol/methanol brine pumps	Chlorine storage (1 – ton cylinders)	1945	Frank J. Cregg, Jr.
43	1975	Dry storage – extraction – penicillin and splitting	Same	1945	Frank J. Cregg, Jr.
20 A	1976	Media slurry building (fermentation)	Same	1945	National Cellulose Corporation
20 B	1976	Railroad car unloading (corn syrup)	Same	1945	National Cellulose Corporation
44	1976	Pnuematic equipment building (fermentation)	Same	1948	Agnes G. Roberts
45	1976	Drum storage shed	Same	1945	Frank J. Cregg, Jr.
46	1977	Mechanical refrigeration	Same	1945	Frank J. Cregg, Jr.
32 A	1978	Research – pharmacology	Same	1945	National Cellulose Corporation
48	1979	Waste water pH control building	Same	1945	Reconstruction Finance Corporation
49	1979	Waste water pumping station	Same	1948	Agnes G. Roberts
50	1979	Truck sampling	Same		James K. Turner & Richard K. O'Dea
51	1979	Administration	Same		Stanley Legawiec & Jane Legawiec
36 A	1980	Utilities – chilled water & compressed air for ferm.	Same	1945	Reconstruction Finance Corporation
52	1980	Control building – solvent recovery	Same	1945	Frank J. Cregg, Jr.
53	1980	Cooling tower pump shed, solvent recovery	Same	1945	National Cellulose Corporation
21 B	1981	Not in use	Distilled water still/ultrafilter pilot	1945	Reconstruction Finance Corporation
54	1981	Electrical equipment building	Same	1945	Reconstruction Finance Corporation
55	1981	Security center	Same	1945	National Cellulose Corporation
56	1981	6APA drying building	Same	1945	Frank J. Cregg, Jr.
59	1982	PCL3 & DDS storage building	Same	1945	Frank J. Cregg, Jr.
58	1983	Fermentation development building	Same		Procul Realty Company, Inc.
57	1985	Corn syrup pump house	Same	1945	Reconstruction Finance Corporation
60	1985	IPA recovery still	Same	1945	Reconstruction Finance Corporation
43 A	1986	Drum storage	Same	1945	Frank J. Cregg, Jr.
61	1986	Fire water pump station	Same	1945	Frank J. Cregg, Jr.

Table 1. Thompson Road Facility Building Identification

Bld No.	Year Building Const	Current Use	Past Use	Year Prop. Purch.	Property Purchased From
32 B	1988	Toxicology	Same	1945	
36 B	1988	Service – chiled cater & compressed air for ferment	Same	1945	
62	1988	Extraction/Filtration and Drying (TITUS)	Same	1945	
63	1988	Tank Farm Service Building	Same	1945	National Cellulose Corporation
64	1988	Tank Storage Building	Same	1945	National Cellulose Corporation
65	1988	Tanker Unloading Building	Same	1945	National Cellulose Corporation
66	1989	Drum Transfer Station Pump House	Same	1945	National Cellulose Corporation
67	1989	Liquid Raw Material and Hazardous Waste Drum Storage	Same	1945	National Cellulose Corporation
68	1990	LPP Drum Storage Building	Same	1945	
69	1992	Waste Water pH Control Building	Same	1945	
70	1992	Fire Protection Equipment	Same	1945	
71	1992	Anhydrous Ammonia Tank Building	Same	1945	
58 A	1993	Biologics Pilot Plant	Same	1945	
58 B	1993	Biologics Pilot Plant	Same	1945	
75	1994	Anti–Cancer Development Laboratories	Same	1945	
25 N	1994	Organic Synthesis Pilot Plant	Same	1945	

Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York*. For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.

Table 2
Facility Manufacturing Summary

	Production		Chemicals used during Manufacturing Processes			Waste Material Generation and Handling		
	Span	Scale	Fermentation/Manufacturing	Extraction (product recovery)	Product Finishing	Mycelia/Broth Solids (high TSS and COD)	Solvents/Recovery Wastes	Finishing Wastes
Thompson Road Facility Penicillin G (Pen G) primary product manufactured during the 1940s and 1960s	1943 - 1950 1950 - 1969	Batch Process 1 quart bottles to 1,000 gal tanks Continuous Flow 1,000 to 30,000 gal tanks	fermentable carbohydrate ammonia salt various agricultural flours buffers	amyl acetate methyl isobutyl ketone (MIBK) sulfuric acid potassium ethyl hexoate	butanol acetone	cellular material unreacted broth constituents (carbohydrates and proteins): discharged to sanitary sewer	amyl acetate MIBK butanol acetone recovered through distillation and reused in the process[1]	Small drum quantities of waste material Solvents: recovered and reused Product dusts: recycled back into process
Streptomycin	early to mid 1950s one year	not provided	fermentable carbohydrate ammonia salt various agricultural flours buffers	ammonia solution hydrocarbon solvent (possibly methanol) sulfuric acid (regenerated ion exchange resin) caustic (regenerated ion exchange resin)	not provided	cellular material unreacted broth constituents (carbohydrates and proteins) diatomaceous earth discharged to sanitary sewer	Hydrocarbon solvent: Recovered through distillation and reused in the process[1] Regeneration products: discharged to sanitary sewer[2]	not provided
Tetracycline primary product manufactured during the 1950s	1954 - 1970s primary product during 1970s	not provided	fermentable carbohydrate ammonia salt various agricultural flours buffers	alkaline butanol solution	magnesium stearate bulking agent	Cellular material unreacted broth constituents (carbohydrates and proteins) diatomaceous earth: discharged to sanitary sewer	Butanol: recovered through distillation and reused in the process[1]	Small drum quantities of waste material Solvents: recovered and reused Product dusts: recycled back into process
Aspirin	mid-1950s several months	not provided	salicylic acid glacial acetic acid hydrocarbon solvent	acetone	none	not applicable	Hydrocarbon solvent: recovered either on or off site[3,5]	not applicable
Sodium Laurel Sulfate	mid-1950s	not provided	not provided	not provided	not provided	not applicable	[5]	[5]
Tartaric Acid	mid-1950s	not provided	not provided	not provided	not provided	not applicable	[5]	[5]
Vitalis Bottling Line	mid-1950s one year	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	Vessel cleaning and bottle washing water: minimal discharges to sanitary sewer system
Penicillin V (Pen V) primary product manufactured during the 1970s, 80s and 90s	late-1960s to present	not provided	fermentable carbohydrate ammonia salt various agricultural flours buffers	MIBK chemical used to create acidic environment	Butanol acetone [7]	Cellular material unreacted broth constituents (carbohydrates and proteins): discharged to sanitary sewer	Waste activated carbon[6]: discharged to sanitary sewer MIBK, Butanol, Acetone: Waste solvents not recovered onsite were transferred to third parties for offsite recovery and disposal[1,4] 1994 to present - retenate: discharged to sanitary sewer	Small drum quantities of waste material[7] Solvents: recovered and reused Product dusts: recycled back into process
6-APA (key Penicillin building blocks)	1960s - present	not provided	fermentable carbohydrate ammonia salt various agricultural flours buffers	1960s: Butanol 1970s: dimethyldichlorosilane (DDS), dimethylanaline (DMA), methylene chloride, methanol, phosphorus pentachloride, liquid nitrogen, ammonia solution, POAC[8] 1980s: MIBK	MIBK acetone	Enzyme recovery solids: discharged to sanitary sewer 1980s: Enzyme recovered and reused	1960s to 1970s - butanol: recovered through distillation and reused in the process[1] 1970s - methylene chloride, methanol, MIBK, acetone: Waste solvents not recovered onsite were transferred to third parties for offsite recovery and disposal[1,4] POAC[8] 1980s - MIBK on-site solvent recovery[9,10]	Caustic solution: discharged to sanitary sewer
Semi-Synthetic Penicillins examples: ampicillin, staphcillin, prostaphlin, syncillin and tegopen	1960s to 1971	not provided "small quantities"	Acid Chloride Crystalline 6-APA	sodium methyl hexoate	acetone bulking agent	Aqueous phase of batch reaction (elevated levels of salts - primarily sodium chloride): discharged to sanitary sewer	MIBK: on and offsite recovery Waste solvents not recovered on-site were transferred to third parties for offsite recovery and disposal[1,4]	Small drum quantities of waste material Solvents: recovered and reused Product dusts: recycled back into process

Table 2 (cont.)
Facility Manufacturing Summary

	Production		Chemicals used during Manufacturing Processes			Waste Material Generation and Handling		
	Span	Scale	Fermentation/Manufacturing	Extraction (product recovery)	Product Finishing	Mycelia/Broth Solids (high TSS and COD)	Solvents/Recovery Wastes	Finishing Wastes
Kanamycin	early 1960s to present	not provided	fermentable carbohydrate ammonia salt various agricultural flours buffers	ammonia solution methanol sulfuric acid (regenerated ion exchange resin) caustic (regenerated ion exchange resin)	none mentioned [11]	cellular material unreacted broth constituents (carbohydrates and proteins) diatomaceous earth discharged to sanitary sewer	Methanol: Recovered through distillation and reused in the process[1] Regeneration products (sodium sulfate), filter aid (until 1980) and ion exchange bed solids (1980 to present): discharged to sanitary sewer[2]	none mentioned [11]
Miscellaneous Fermentation Products	late 1960s one year	not provided	Similar to those used in penicillin production	Similar to those used in penicillin production	Similar to those used in penicillin production	Similar to those generated in penicillin production	Similar to those generated in penicillin production	Similar to those generated in penicillin production
Cephalosporin D (Ceph D)	1970 - present	not provided	fermentable carbohydrate ammonia salt various agricultural flours buffers	isobutyl chloroformate (IBCF) acetone MIBK	none mentioned	cellular material unreacted broth constituents (carbohydrates and proteins) diatomaceous earth discharged to sanitary sewer	MIBK and acetone: Waste solvents not recovered on-site were transferred to third parties for off-site recovery and disposal[1,4] Filter aid (1970s) and retenate (1980s): discharged to sanitary sewer	none mentioned
7-ACA primary product manufactured during the 1990s	1970s - present	not provided	none mentioned	dimethyldichlorosilane (DDS), dimethylanaline (DMA), methylene chloride, methanol, phosphorus pentachloride, ammonia solution, Ceph D	none mentioned	none mentioned	1970s methylene chloride, methanol: Waste solvents not recovered on-site were transferred to third parties for off-site recovery and disposal[1,4] 1980s on-site solvent recovery[9,10]	none mentioned
Amikacin	1970s - present	1970s: 10,000 kg/year "low volume production"	fermentable carbohydrate ammonia salt various agricultural flours buffers	ammonia solution methanol sulfuric acid (regenerated ion exchange resin) caustic (regenerated ion exchange resin) calcium hydroxide	conducted at other BMS facilities locations not mentioned	cellular material unreacted broth constituents (carbohydrates and proteins) diatomaceous earth discharged to sanitary sewer	Methanol: Recovered through distillation and reused in the process[1] Regeneration products: discharged to sanitary sewer[2]	none mentioned
BHBA (5-5-benzyloxycarbonylamino-2-hydroxybutyric acid)	1970s - present	1970s: 10,000 kg/year "low volume production"	monosodium glutamate sodium nitrate ammonium hydroxide sodium hydroxide sulfuric acid	MIBK 1970s: heptane	not provided	not provided	inorganic salts, organic by-products of the reaction, and low levels of MIBK: until 1990: discharged to sanitary sewer 1990 to present: on-site solvent recovery to remove MIBK MIBK distillate: recycled and reused 1970s - MIBK/Heptane mother liquids: collected and sent offsite for incineration 1980s - MIBK mother liquids: collected and sent to on-site solvent recovery	not provided

Table 2 (cont.)
Facility Manufacturing Summary

	Production		Chemicals used during Manufacturing Processes			Waste Material Generation and Handling		
	Span	Scale	Fermentation/Manufacturing	Extraction (product recovery)	Product Finishing	Mycelia/Broth Solids (high TSS and COD)	Solvents/Recovery Wastes	Finishing Wastes
Butorphanol tartrate	1980s	1980s: 100kg/yr "minor production"	thionyl chloride triethylamine peracetic acid sulfuric acid acetone methylene chloride	toluene heptane dimethylsulfide boron complex (DMSB) phosphoric acid propanol methanol hydrobromic acid ammonium hydroxide tartaric acid activated charcoal	conducted at other BMS facilities locations not mentioned	not applicable	acetone/aqueous solution including inorganic salts, organic by-products and toluene: 1980s - neutralized and sent to on-site recovery 1990s - sent off-site for disposal by incineration (location not identified) Distillates and washes containing methylene chloride, acetone, toluene, heptane, isopropyl alcohol: disposed of by off-site incineration Aqueous wash containing inorganic salt, organic by-products, methylene chloride and toluene: neutralized and discharged to sanitary sewer Recovered cake from polish filters and carbon filters: disposed of by off-site incineration Methanol mother liquor and distillate: on-site solvent recovery[10]	not provided
West Taylor Street Penicillin G (Pen G)	1943 - 1944	Batch Process 1 quart bottles to 1,000 gal tanks	fermentable carbohydrate ammonia salt various agricultural flours buffers	amyl acetate methyl isobutyl ketone (MIBK) sulfuric acid potassium ethyl hexoate	butanol acetone	cellular material unreacted broth constituents (carbohydrates and proteins): discharged to sanitary sewer	amyl acetate MIBK butanol acetone recovered through distillation and reused in the process[1]	Small drum quantities of waste material Solvents: recovered and reused Product dusts: recycled back into process
Molloy Road Liquid cold preparation	1980 - 1986	3 x 1,000gal tanks 1 x 1,000gal tanks	not applicable	not provided	not provided	not applicable	not applicable	wastewater (sorbitol and washwater): neutralized then discharged to sanitary sewer
Cold tablet preparation	1980 - 1986	not provided	not applicable	not applicable	alcohol active ingredients	not applicable	not applicable	wastewater (ethanol, isopropanol, washwater): neutralized then discharged to sanitary sewer
Non-penicillin capsule production	1980 - 1986	not provided	not applicable	not applicable	alcohol active ingredients	not applicable	not applicable	wastewater (ethanol, isopropanol, washwater): neutralized then discharged to sanitary sewer
Salutensin	not provided	not provided	not provided	not provided	not provided	not provided	not provided	not provided
Saluron tablets	not provided	not provided	not provided	not provided	not provided	not provided	not provided	not provided

Table 2 (cont.)
Facility Manufacturing Summary

Notes:
All information in this table was obtained from a Bristol-Myers document written in August 1995 titled "Summary of Historical Activities 1943 - Present" and Mailing No. 3. References to "present" throughout the table refer to 1995.
Pilot plant operations occurred during the development of nearly every product listed above. Bristol generally handled wastes generated in a manner consistent with the handling of full-scale waste stream discharges. However, during smaller pilot-scale operations and on other isolated occasions, waste solvents were disposed of off-site, outside of Onondaga County. Waste solvents generated during research and development activities have been sent off-site for disposal.
Wastewaters generated from the washing and rinsing of process equipment between product runs and following product campaigns are typically discharged to the sanitary sewer. Materials in the wastewater include caustic solutions, chelating agents (remove calcium deposits), acetone and sodium hypochlorite (strong oxidant).
Discharges to the sanitary sewer also included "non-contact cooling water blowdown" containing a variety of water conditioning agents including sodium dichromate (biocide) and molybdenum-based biocide agents.
Returned goods (expired pharmaceutical products) disposal resulted in a continuous low-flow, high strength (high COD due to the presence of pharmaceutical product) discharge to the sanitary sewer for three years during the early 1980s. Prior to the 1980s returned goods were landfilled (location not identified). From 1985 to 1986, returned goods were disposed of at a local East Syracuse hammermill. Following 1996, returned goods were disposed of in Evansville, Indiana.
[1]The distilled aqueous residuals from solvent recovery were discharged to the sanitary sewer.
[2]Both regeneration products were combined following use (to form sodium sulfate) and discharged to the sanitary sewer.
[3]Aqueous residuals from solvent distillation were disposed of off-site.
[4]The vast majority were transported outside of the Syracuse, NY area.
[5]The operation resulted in no routine discharges to the sanitary sewer system.
[6]Waste stream eliminated in the 1970s.
[7]Product finishing operations were conducted at other Bristol locations in the early 1970s, returning to Syracuse from 1974 - 75 before being sent back overseas.
[8]The post reaction non-ammonia solution which consisted of POAC (precursor to 6-APA), DMA, and process solvents. The firm recovered the process solvents and returned the DMA and POAC to Bristol for reuse in the project.
[9]In 1980, a solvent recovery facility was constructed to recover methylene chloride, MIBK and methanol form 6-APA and 7-ACA production operations.
[10]The distilled aqueous residuals from solvent recovery were shipped as a liquid waste to an offsite facility for ultimate disposal outside of Onondaga County.
[11]Product finishing facilities were relocated from the Thompson Road facility to other Bristol locations in the early 1970s. This had only a minor impact on the quantity and quality of wastes generated during the production of this material.
The Industrial Wastewater Pretreatment facility was expected to be operational in 1996.

Table 3
Warehouse Activities Summary

		Items Stored at Warehouse			
Warehouses	**Timeframe**	**Raw Materials**	**Packaged/Finished Goods Storage**	**Miscellaneous Storage Items**	**Process Wastewater**
Thruway Building	early 1970s[1]	no	yes	none	routine floor washdowns
Bridge Street 1	1970 - 1980s	rarely[2]	yes	none	routine floor washdowns
Bridge Street 2	1975 - 1980s	yes[2]	occasionally	none	routine floor washdowns
Mobile Warehouse	early to late 1970s	yes[3]	not mentioned	none	routine floor washdowns
PJ's (Midler Avenue)	late 1970s	yes[3]	not mentioned	none	routine floor washdowns
PJ's (Liverpool)	late 1970s to 1982	yes[3]	not mentioned	none	routine floor washdowns
Molloy Road	1980 - 1986	yes[3,7]	not mentioned	none	routine floor washdowns[6]
Boss Road	early to mid 1980s	yes[3]	not mentioned	none	routine floor washdowns
Park Street Freezer	1990 to present	not mentioned	not mentioned	temporary storage of 7-ACA, 31 AcHCL and enzyme	no significant amounts
Thompson Road Facility Building 21A - basement	1986 to present	yes[4]	not mentioned	materials to support kanamycin and amikacin production	not mentioned
Syracuse Cold Storage	1989	not mentioned	not mentioned	storage of 7-ACA	no significant amounts
Gleason Warehouse	1992 to present	yes[5]	not mentioned	materials for use, pickup, and delivery	no significant amounts
Aerofin Warehouse	early 1970's	no	yes	none	no significant amounts

Notes:
Information in this table was obtained from a Bristol-Myers document written in August 1995 titled "Summary of Historical Activities 1943 - Present" and Mailing No. 3 (1997). References to "present" throughout the table refer to 1995, except for the Gleason Warehouse in which the reference to "present" refers to 1997.

1. Start date not provided in Bristol documents.
2. Raw materials consisted mostly of dry powders, but also included some acids stored in 5-10 gallon carboys.
3. Raw materials consisted mainly of dry bulk materials, but also included some phoshoric acid stored in 5-10 gallon carboys.
4. Table 1.1 Building History (from Summary of Historical Activities 1943 - Present) describes the current use of Building 21A as "raw material and product dry storage/labs".
5. Miscellaneous raw materials. The composition of the raw materials was not mentioned.
6. See Table 2 of this Site Summary Report for additional wastewater generated from manufacturing activities.
7. Additionally, the raw materials consisted of the following hazardous materials: ethylene oxide (11,000 kg), glutaraldehyde (208,175 mL), activated carbon (18 kg), sodium hydroxide (1 kg), sulfuric acid [cone] (14,000 mL), sulfuric acid 35% (290,000 mL), sodium hydroxide solution (180 L), opaspray orange (25,000 mL), five electric batteries wet storage, muriatic acid (770 gal), and liquid caustic soda (770 gal) (p. D05231).

Table 4

SUMMARY TABLE
1991 SARA MASS BALANCE NUMBERS
(Six VOC Compounds Potentially Regulated under 6NYCRR233)

Compound Name:	Acetone	Acetonitrile	n-Butyl Alcohol	Methanol	MIBK	Toluene
CAS #:	67-64-1	75-05-08	71-36-3	67-56-1	108-10-1	108-88-3
Starting Inventory:	226,612	10,102	175,482	297,267	497,193	6,361
Ending Inventory:	240,408	9,041	160,070	240,119	320,067	22,180
Purchases:	2,772,219	37,275	278,176	644,246	1,393,757	63,782
Usage:	2,758,423	38,336	293,588	701,394	1,570,883	47,963
Chemically consumed:	0	0	0	132,870	0	0
Chemically generated:	0	0	0	0	0	7,151
In Product:	27	0	359	294	2,044	0
Point losses to air:	125,434	107	4,441	43,858	127,839	404
Non point losses to air:	2,254,424	22,870	162,120	427,448	1,146,996	1,534
Sewer loss (POTW):	292,000	7,800	125,450	81,833	291,200	8,742
Storm sewer:	1,180	0	158	10,283	343	57
Off-Site Energy Recovery:	84,798	5,185	773	2,953	2,461	43,709
Off-Site Incineration:	560	2,374	287	1,855	0	668

Note: Units are pounds per year.

Note: Bristol did not include one high volume VOC (methylene chloride) in the mass balance because methylene chloride is "explicity exempt from 6NYCRR233" (p. D0012900)

Source: Bristol Myers Squibb Company's response to Clean Air Act Section 114 Information Request (Reference No. 114 P92-61)

Table 5

MAJOR SPILLS AND LEAKS
BRISTOL–MYERS SQUIBB
THOMPSON ROAD FACILITY

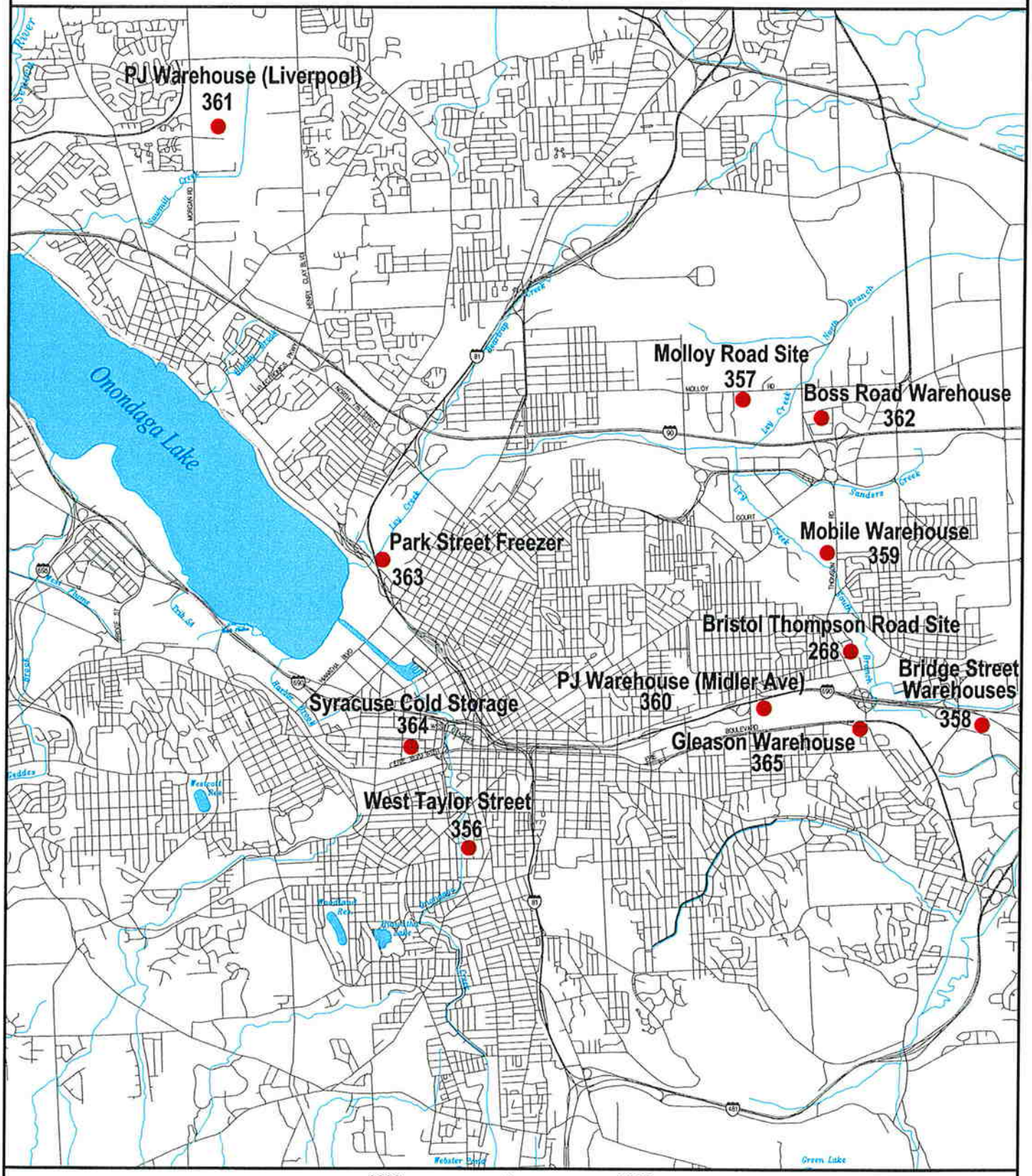
Date of Spill	Location of Spill	Type of Waste	Quantitiy Spilled	Cleanup Action
July 25, 1976	Building 18 Fuel Oil Tanks	No. 6 Fuel Oil	2,276 gallons to Ley Creek *	Oil booms placed in Ley Creek, oil collected pumped into tank trailers, banks of brook manually cut back
November 7, 1984	Tank CHT–5, CHT Tank Farm	Methanol	4,900 gallons	Drained to sanitary sewer
August 12, 1985	Distillation Column	MIBK	1,500 gallons	Drained to sanitary sewer
October 1986	Tank DS–55, Security Center	Diesel Fuel	Unknown	Holes found in bottom of tank, tank was excavated and removed along with all stained soils
January 7, 1986	Tank R–3 near Building 52	MIBK	1,100 gallons	Drained to sanitary sewer
June 6, 1988	Tank CHT–1, CHT Tank Farm	Methanol Methylene Chloride	5,242 gallons	Leaked to soils in CHT vault which drained to the sanitary sewer. Soil and tanks removed, vacuum extraction system installed
October 18, 1988	Tank Oil 2, Boilerhouse	No. 6 Feul Oil	Unknown	During upgrade, oil stained soils encountered, tank and approximately 300 cubic yards of visibly impacted soil was removed
June 30, 1991	Pipe rack near Building 59	Methylene Chloride Methanol DCHA	1,000 gallons	Spill flowed down gravel slope, onto asphalt, into storm sewer and into Ley Creek. Adsorbent matterial placed on asphalt, approximately 40 yards of soil were removed, no visible impacts to Ley Creek observed
July 19, 1991	4B Sump	Butanol MIBK Acetone	Unknown	During an inspection of the sump, a hole was found in the bottom. A new floor was poured in the sump and a soil boringwas conducted just east of the sump. A soil sample was analyzed for TCLP. Results indicated non–detects.
August 16–21, 1991	HEPA Filter Housing, Titus System	Methanol	5,000 gallons	Released to the air. Cracks in the filter housing were repaired and the seal leg was refilled.
July 2, 1992	Building 52, Solvent Recovery	MIBK	2,500 gallons	Drained to sanitary sewer

* This spill was discharged into Headson's Brook at a point 1,000 feet upstream of its confluence with the South Branch of Ley Creek (p. 000602).

Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York*. For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.

FIGURES

Site Locations: Bristol - Myers Squibb Facilities



Site Locations with Site ID

6000 0 6000
Scale in Feet

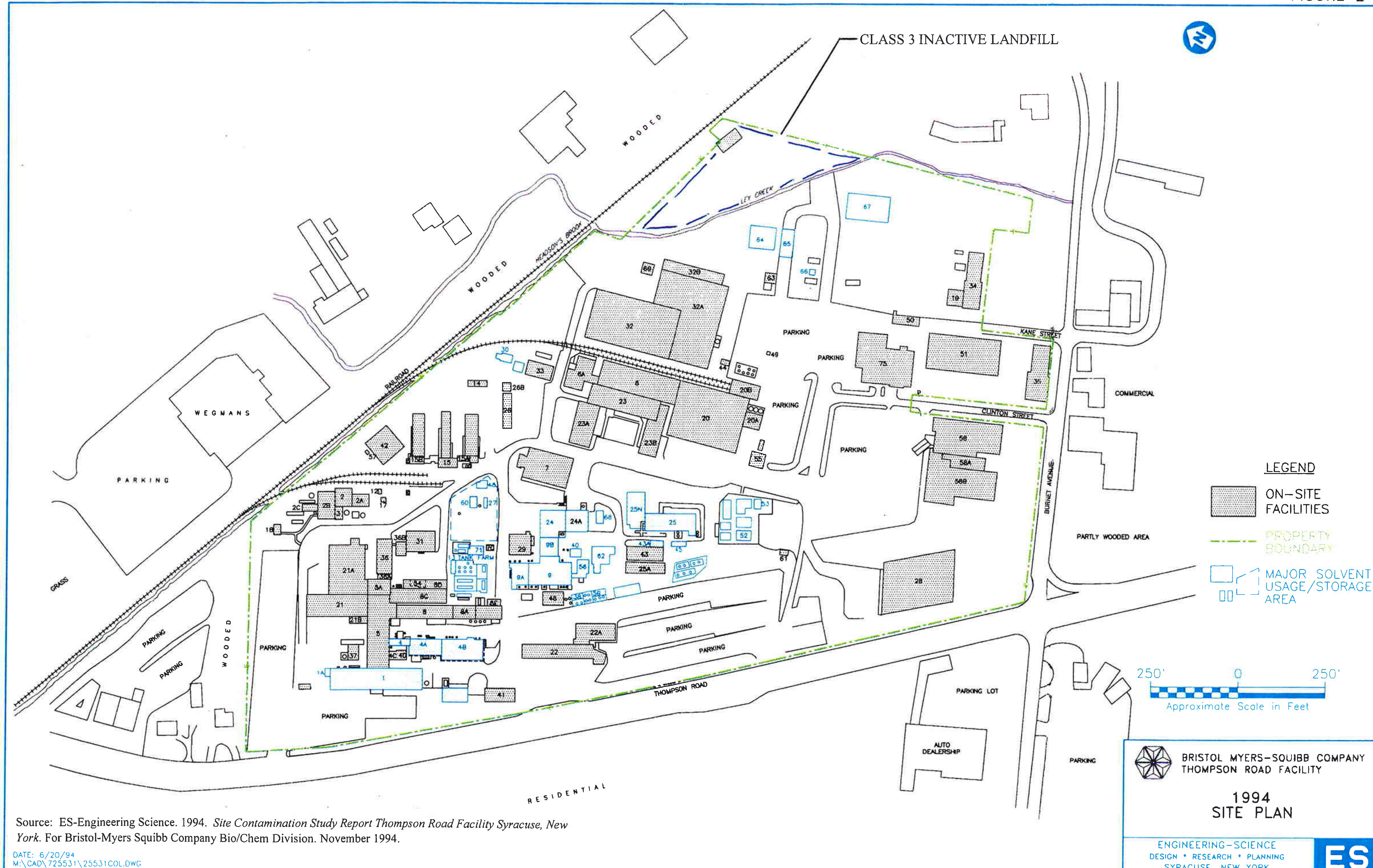
2000 0 2000
Scale in Meters

TAMS

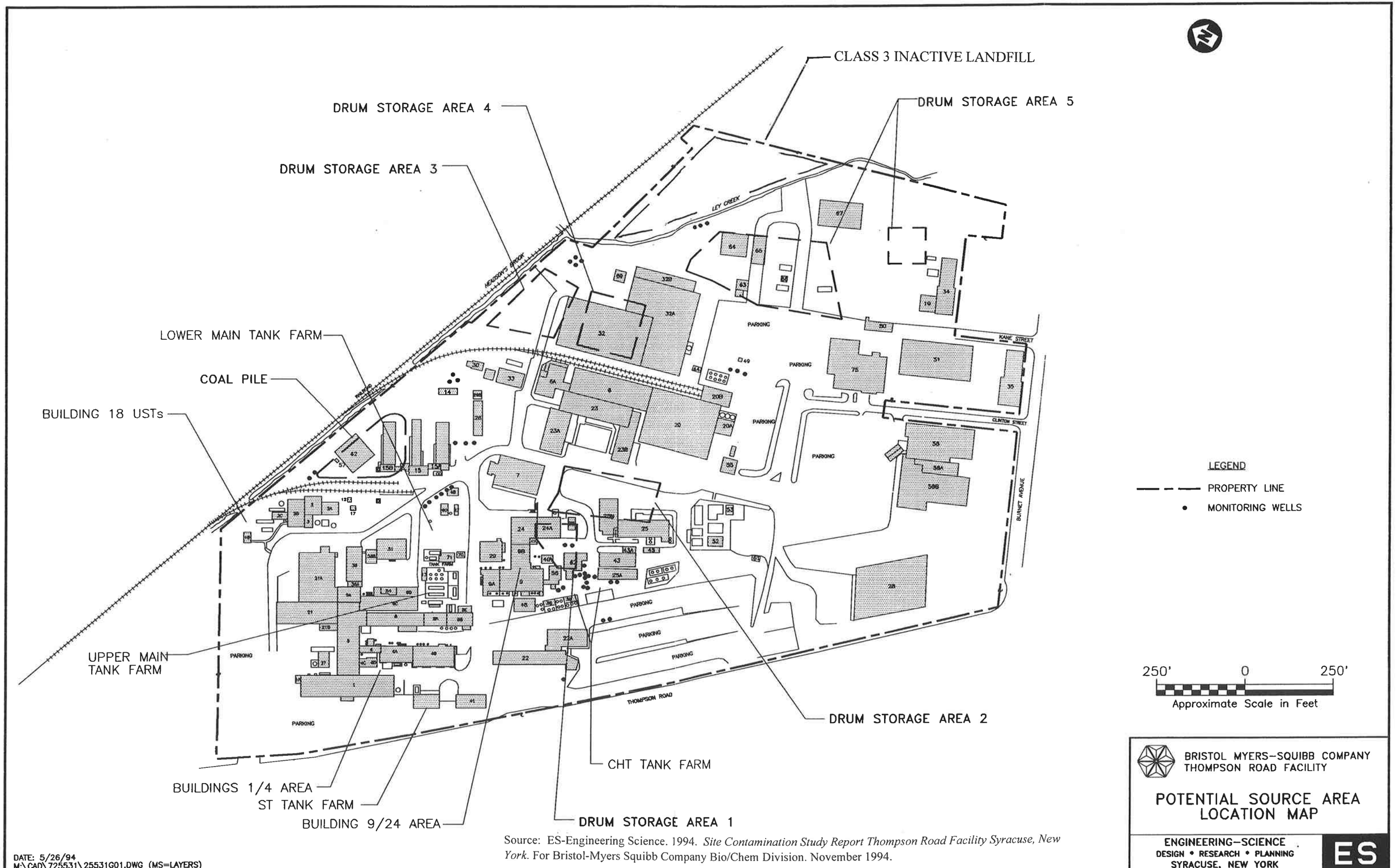
N

Figure 1

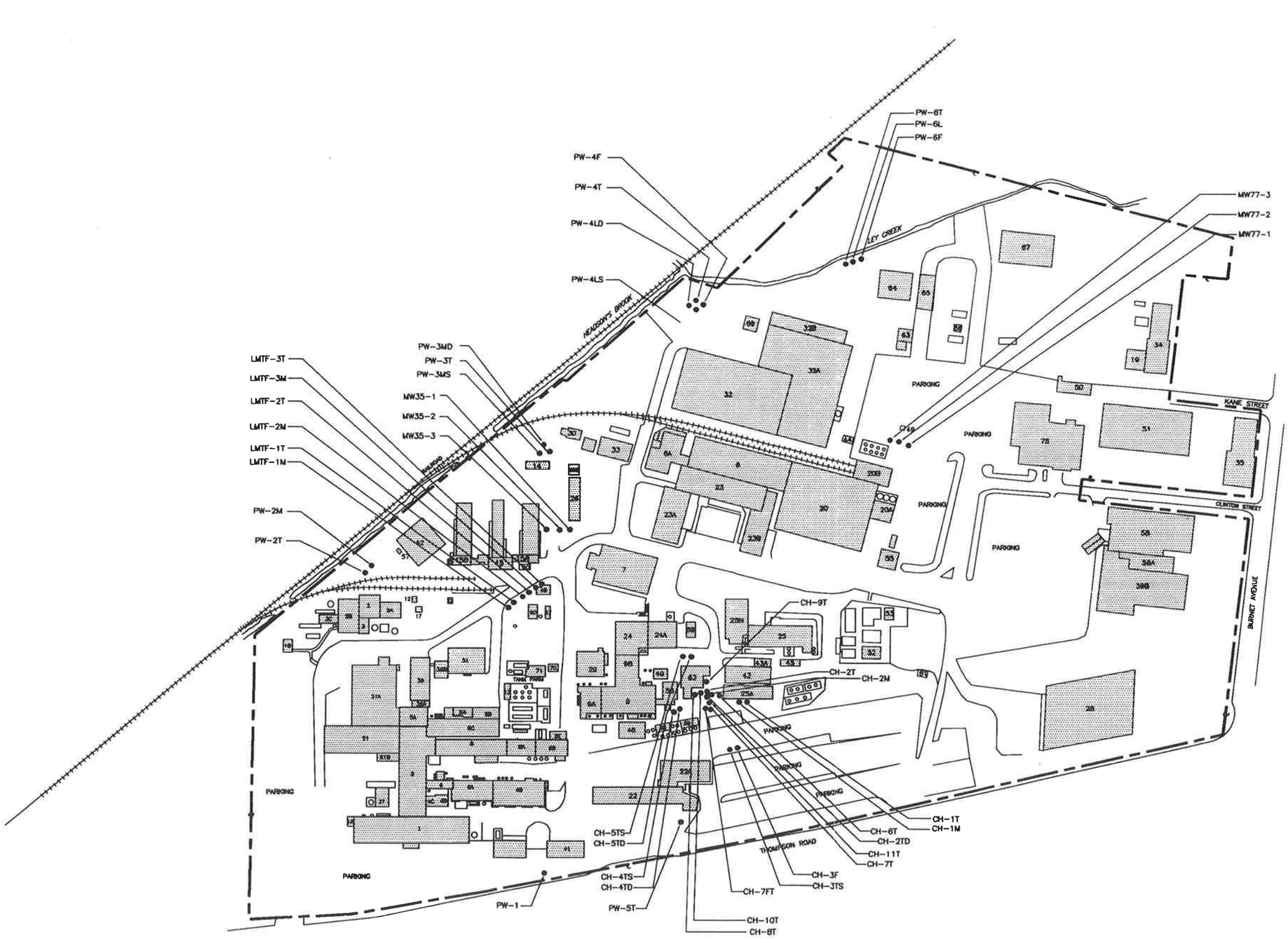
FIGURE 2



Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York*. For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.



Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York.* For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.



LEGEND

PROPERTY LINE

MONITORING WELLS

250' 0 250'

Approximate Scale in Feet

Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York*. For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.

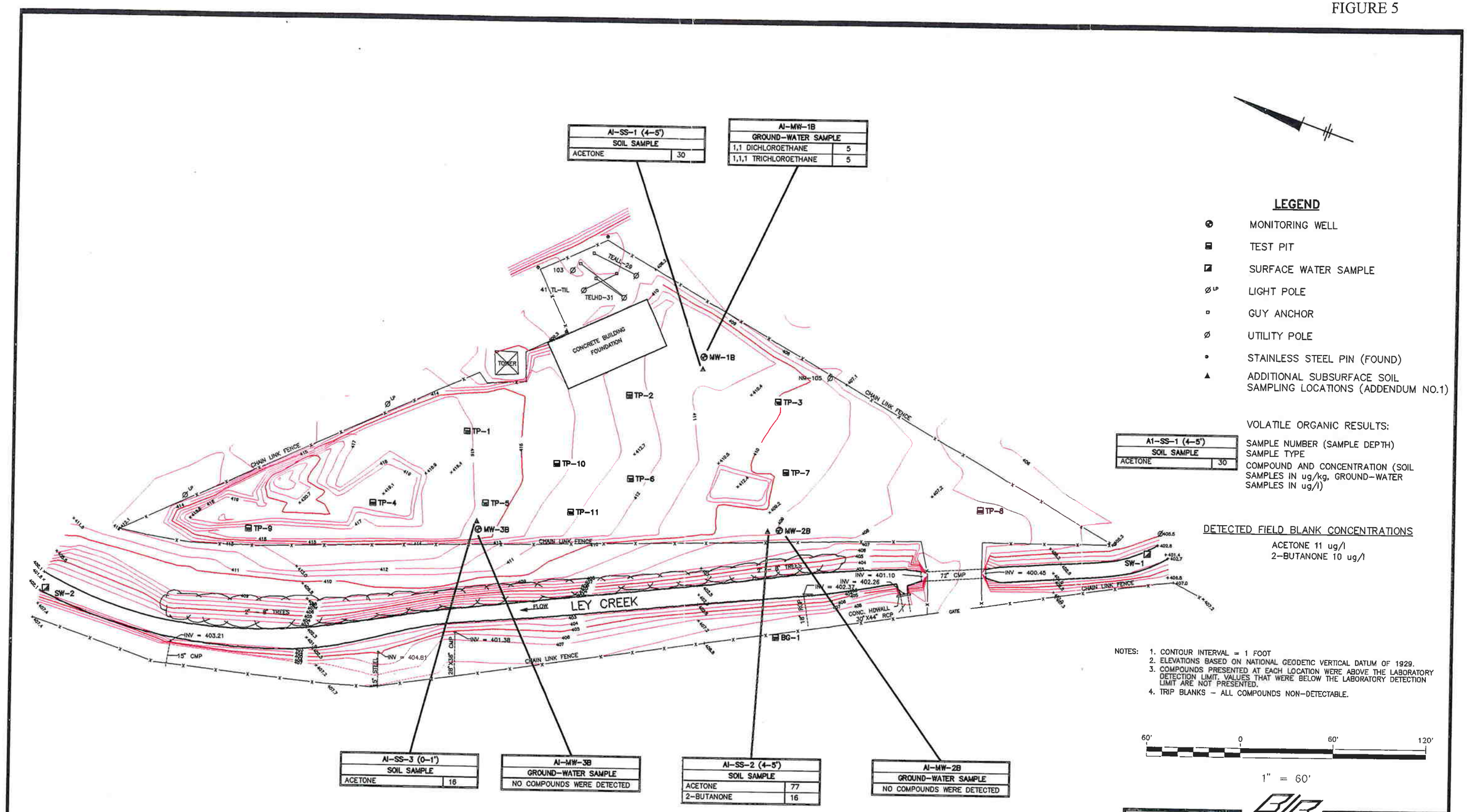
BRISTOL MYERS-SQUIBB COMPANY
THOMPSON ROAD FACILITY

MONITORING WELL LOCATION PLAN

ENGINEERING-SCIENCE
DESIGN • RESEARCH • PLANNING
SYRACUSE, NEW YORK

ES

DATE: 5/26/94
M:\CAD\725531\25531G01.DWG (MS=LAYERS)



NOTES:
1. CONTOUR INTERVAL = 1 FOOT
2. ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929.
3. COMPOUNDS PRESENTED AT EACH LOCATION WERE ABOVE THE LABORATORY DETECTION LIMIT. VALUES THAT WERE BELOW THE LABORATORY DETECTION LIMIT ARE NOT PRESENTED.
4. TRIP BLANKS – ALL COMPOUNDS NON-DETECTABLE.

Source: Blasland, Bouck & Lee, Inc. 1994. *Preliminary Site Assessment Supplemental Report : Bristol Laboratories Site NYSDEC Inactive Hazardous Waste Disposal Site No. 734001.* For Bristol-Myers Squibb Company. March 1994.

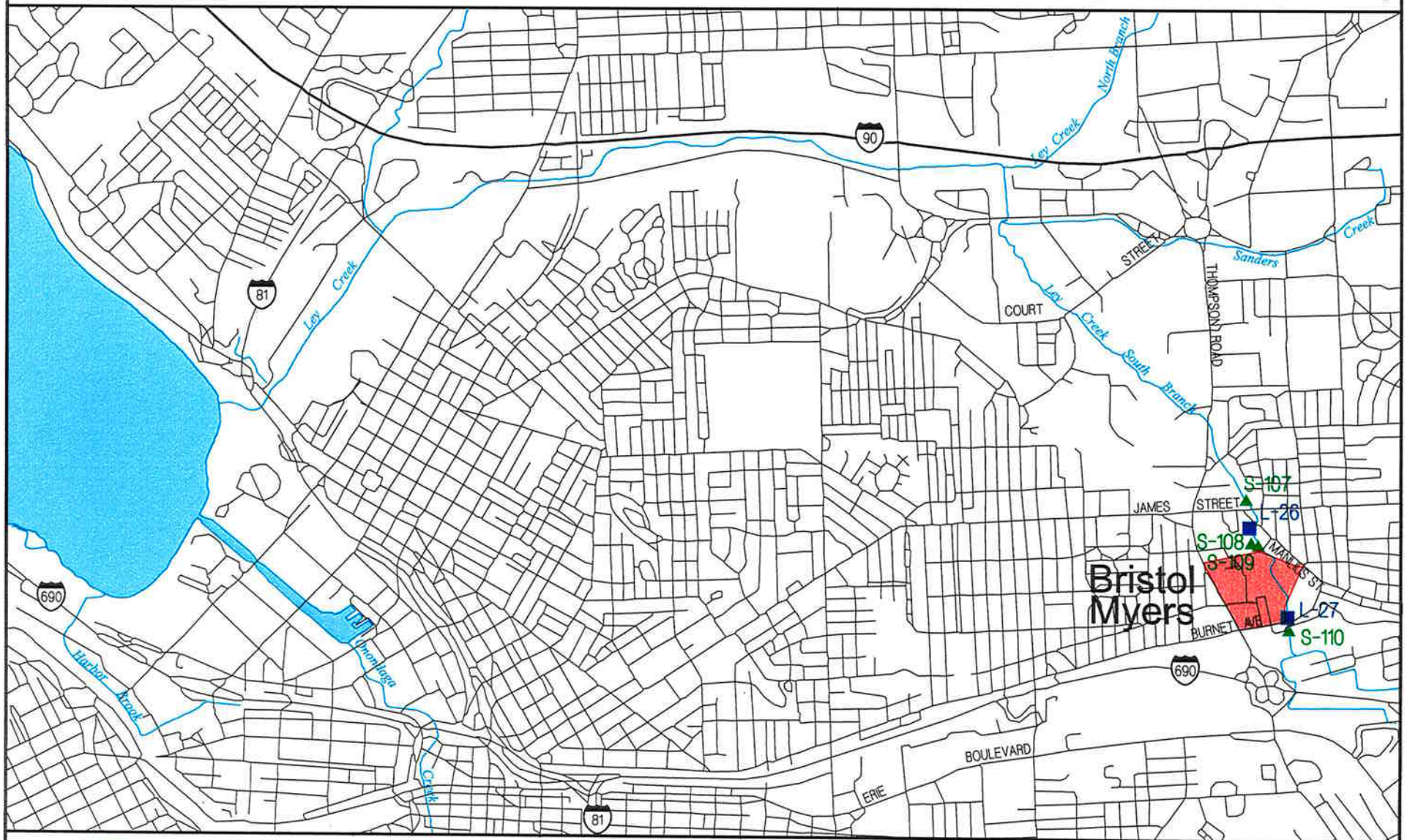
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

BRISTOL-MYERS SQUIBB COMPANY
BRISTOL LABORATORIES SITE
NYSDEC INACTIVE HAZARDOUS WASTE
DISPOSAL SITE NO. 734001

VOLATILE ORGANIC ANALYSES

OPTIONAL L: ON-VOA, OFF-Y
3/94 54-YCC
8700206R\87002BM1.DWG

NYSDEC Sediment Sample Locations Near Bristol Myers Thompson Road Facility



104(e) Site Location

L-28 1996 Sediment Sample

S-108 1997 Sediment Sample

3000 0 3000
Scale in Feet

1000 0 1000
Scale in Meters

N

TAMS

Figure 6

APPENDICES

APPENDIX A

Supplemental Spill Information

Source: Bristol-Myers Squibb, Mailing No.1, August 1995.

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

VI SIGNIFICANT LEAKS OR SPILLS

Date	Location	Volume Released	Material Released	Fate of Spill
11/2/89	Bldg. 24A	79 gal.	Acetone	Sanitary Sewer
1/4/90	Bldg. 4	200-300 gal.	MIBK	Sanitary Sewer
3/7/90	Tank V-79	10-15 gal.	35% Acetone 5% MIBK	Diked Areas and Adjacent Roadway
5/11/90	Transfer Line	2-5 gal.	Methanol	Ground
12/14/90	Bldg. 13	45-60 gal.	20% Acetone	Adjacent Roadway
12/25/90	Bldg. 4B	<800 gal.	MIBK/Water	Sanitary Sewer
1/1/91	N. of Bldg. 9	10-30 gal.	Sulfuric Acid	Ground
1/3/91	Bldg. 9	340-400 gal.	25% $MeCl_2$ 50% MeOH	Sanitary Sewer
1/4/91	POAC Tank	25-30 gal.	15% Sodium Phenoxyacetate	Pavement
4/19/91	Bldg. 27	<2 gal.	n-Butanol	Ground
4/27/91	Bldg. 9	133 gal.	MIBK	Sanitary Sewer
6/30/91	Bldg. 59	1,000 gal.	25% $MeCl_2$ 50% MeOH	Storm Sewer
7/19/91	4-B Sump	Unknown	1,000-5,000 ppm solvents	Subsurface Soils
8/22/91	Transfer Line	850 gal.	Sulfuric Acid	Sanitary Sewer
11/19/91	Building 62	90 gal.	MIBK	Storm Sewer
4/9/92	VE Tank Farm	5-10 gal.	25% $MeCl_2$ 50% MeOH	Ground
7/2/92	Bldg. 52	2,500 gal.	MIBK	Sanitary Sewer

59B-MS(2)

SPILLS/LEAKS 9/10 -- 11/19/86

DATE	SOLVENT	REMARKS
9/10/86	MIBK	Loose Clean-Out Gasket on of Tanker unloading MIBK by Carpenter Shop - 5 Gal.
9/22/86	MIBK	--800 Gal to Sewer.
10/1/86	H_2SO_4 (93%)	Tank unloading Station Leaking Gasket on Top of Tanker - 20 Gal.
10/2/86	M_ECL_2	Overflow of V90 outside 9S. Unknown Amount reported by County.
10/2/86	MIBK	Source unknown reported by County.
10/7/86	BLEOMYCIN	Ruptured glass lab fermenter Bldg 58 - 4 Liters.
10/7/86	DMA	Flow to ground from Vent Line while unloading DMA tanker outside 9S - 10 Gal
10/9/86	H_2SO_4 (66%)	Tipped over 55 Gal Drum in roadway south of Bldg 8 ---- 20 Gal.
10/10/86	H_2SO_4 (35%)	Overflow CHT-12 from Make-up in Bldg 9 Kana Area - 200 Gal+
10/12/86	MIBK	Source unknown reported by County.
10/13/86	H_2SO_4 (93%)	Transfer line break under road. Main Tank Farm -- Boiler House - 200 gal
10/20/86	MEOH	Overflow from K-7 outside Bldg 9 - Kana Area
10/23/86	MIBK	To sewer from Centrico Bldg 9S Splitting - Reported ------ 50 Gal.
10/25/86	Diesel Fuel	Underground Tank Leak. Diesel Tank feeding Bldg 55 Generator - Unknown.

10/27/86	MIBK	Bldg 13 (Main Tank Farm Pumphouse) Blown seal on MIBK Pump. - Unknown.
11/6/86	DCHA	Cleanout Port Gasket Leak. Tank unloading station ------- 5 Gal.
11/10/86	MIBK	To sewer from Centrico Bldg 9S Splitting - Reported ------ 50 Gal.

Attachment B

SEWER SPILLS

1984	Source of Spill	Solvent
2/84	CHT-9	$MeCl_2$
3/84	CHT-9-10-11	$MeCl_2$
3/84	Unknown	MIBK
4/84	Unknown	Unknown
8/84	VE-4 VE-5	Wastewater
11/84	CHT-5	MeOH
12/84	K-27-K-28	MIBK

7 Spills - 5 from Splitting.
6 if unknown source of MIBK is included.

1985	Source of Spill	Solvent
2/85	CHT-8	MIBK
2/85	Unknown	MIBK
8/85	Sewer Column	MIBK
4/85	Unknown	MIBK
5/85	Unknown	MIBK
1/85	Unknown	Unknown
11/85	CHT-2 CHT-8	MIBK
8/85	T-91	MIBK/$MeCl_2$/MeOH
11/85	Unknown	MIBK
12/85	Sewer Column	MIBK

10 Spills - 3 from Splitting.
7 if unknown sources of MIBK is included.

Attachment B continued

1986	Source of Spill	Solvent
1/86	RT-3	MIBK
2/86	Transfer line	
	T-91 CHT-1	MeOH
4/8	Unknown	MeOH
7/86	Bldg. 9S Centrico	Mother Liquor 50% MIBK
7/86	Trench	MIBK
5/86	CHT-12	DMA
9/86	CHT-8	MIBK
10/86	Bldg. 9S	MIBK MeOH $MeCl_2$
10/86	CHT-8	MIBK
10/86	Unknown	MIBK
10/86	CHT-13	DMA
10/86	K-7	MeOH
11/86	Unknown	MIBK
12/86	ATM Centrifuge	MIBK

14 Spills - 9 from Splitting.
11 if unknown sources of MIBK spills are included.

1987	Source of Spill	Solvent
1/87	Centrico	MIBK
5/87	Sewer Column	MIBK
5/87	Unknown	MIBK
5/87	BuOH col	BuOH
5/87	CHT-5-6	MeOH
5/87	V-46	MIBK

6 Spills - 3 from Splitting.
4 if unknown sources of MIBK are included.

APPENDIX B

Thompson Road Facility Site Data

B1a. Inactive Landfill Sampling Data

B1b. Inactive Landfill Sampling Data

B2. Sanitary Sewer Geoprobe Data

B3. Upper Main Tank Farm Data

B4. Lower Main Tank Farm Data

B5a. CHT Tank Farm Data

B5b. CHT Tank Farm Data

B6a. Perimeter Monitoring Well Data

B6b. Perimeter Monitoring Well Data

B6c. Perimeter Monitoring Well Data

APPENDIX B1a

Source: Blasland, Bouck & Lee, Inc. 1992. *Preliminary Site Assessment Engineering Report: Bristol Laboratories NYSDEC Inactive Hazardous Waste Disposal Site No. 734001.* For Bristol-Myers Squibb Company. December 1992.

ROY F. WESTON, INC.
INORGANIC ANALYSES - DATA VALIDATION SUMMARY

CLIENT: BLASLAND & BOUCK ENGINEERS
TASK: 9854, 9879, 9884
SDG: 9854

Client Sample ID:	BG-1	FB-1	MW-1B (10-12')	MW-2B (10-12')	MW-3B (5-7')	TP-1	TP-10	TP-2	TP-3
Matrix:	SOIL	WATER	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units:	mg/kg	ug/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
INORGANIC ELEMENTS									
Aluminium	6130 J	46 J	8580 J	5040 J	4100 J	6230 J	6580 J	6190 J	7230 J
Antimony		1.2 UJ						0.45	
Arsenic	5.2 J	UJ	5.1 J	3.4 J	5 J	2.2 J	7.4 J	6.1 J	3.5 J
Barium	52.7	23	232	259	43.3	50.2	84.8	111	41.7
Beryllium	0.42 J	UJ	0.65 J	0.28 J	0.34 J	0.42 J	0.55 J	0.5 J	0.58 J
Cadmium		6					0.55 U	1.3 U	
Calcium	67900	20700	76600	61300	105000	67300	42000	86700	45100
Chromium	10.6 J	UJ	15.6 J	9.1 J	7.7 J	10.5 J	11.3 J	20.5 J	13.8 J
Cobalt	5.5 U	4 U	7.6 U	6.3 U	3.3 U	5.2 U	6.1 U	5.4 J	6.1 U
Copper	17.1		46.4	13.8	11.6	13	32.8	208	33.8
Iron	12400	16 J	17100	11200	8230	11500	21100	13200	13300
Lead	29.2	4.8	27.6	16	17	14.1	224	86	13.3
Magnesium	25900	10300	21400	25600	43400	28900	19400	18900	18500
Manganese	428	6 U	370	316	246	362	630	228	415
Mercury							0.09	0.39	0.42
Nickel	10.8 J	28 J	19.1 J	10.7 J	8 J	10.8 J	13.4 J	18.4 J	16.8 J
Potassium	1140 J	1120 J	1320 J	736 J	521 J	1050 J	950 J	819 J	1260 J
Selenium	UJ	UJ	UJ	UJ	UJ	UJ	UJ	0.26 J	UJ
Silver								0.92	
Sodium	267	2320	479	326	405	348	656	456	340
Thallium	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Vanadium	11.9		13.4	7.8	10.4	10.4	10.9	13.8	12.9
Zinc	42.3 J	19 J	60.8 J	28 J	27.2 J	31.4 J	93.5 J	279 J	71.3 J
Cyanide									

ROY F. WESTON, INC.
INORGANIC ANALYSES - DATA VALIDATION SUMMARY

CLIENT: BLASLAND & BOUCK ENGINEERS
TASK: 9854, 9879, 9884
SDG: 9854

Client Sample ID:	TP-4	TP-6	TP-7	TP-8	TP-9	WS-1	WS-2	WS-3
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
INORGANIC ELEMENTS								
Aluminium	6560 J	2940 J	3340 J	11800 J	4730 J	7460 J	6970 J	3820 J
Antimony			4.2 J	0.56				4.9
Arsenic	4.2 J	8.4 J	12.6 J	23.9 J	5.2 J	7.2 J	3.6 J	36.5 J
Barium	59.4	75.9	81.1	134	42.8	67.1	50.8	79.1
Beryllium	0.5 J	0.96 J	0.47 J	1.1 J	0.28 J	0.56 J	0.44 J	4 J
Cadmium	0.25 U		0.83 U	1.8 U	0.28 U	0.47 U		30.6
Calcium	59100	11200	96600	22200	77200	58100	61300	4670
Chromium	11.1 J	6.6 J	33.6 J	39.5 J	8.4 J	12.2 J	11.6 J	738 J
Cobalt	5.4 U	5.4 U	3.9 U	10.7 U	4.6 U	7.6 U	6.7 U	9.1 U
Copper	17.4	36.4	101	194	17.7	23.3	17.5	195
Iron	12800	15300	11100	22800	10300	14000	13400	195000
Lead	15.4	8.3	626	116	15	37.4	12.3	131 J
Magnesium	22400	4040	19800	11900	29000	24500	29400	446
Manganese	387	83.5	288	444	367	334	374	573
Mercury			0.23	0.97				0.34
Nickel	11.2 J	11.1 J	17.5 J	26.4 J	8.9 J	15.2 J	11.9 J	55.1 J
Potassium	1150 J	333 J	471 J	1430 J	804 J	823 J	969 J	436 J
Selenium	UJ	0.48 J	UJ	1.7 J	UJ	UJ	UJ	3.8 J
Silver			3.2	2.4				1
Sodium	286	497	612	1090	325	387	296	99.4
Thallium	UJ		UJ	0.44	UJ	UJ	UJ	1.1
Vanadium	13.7	13.6	7.9	22.2	8.4	14.7	11.6	26.2
Zinc	39.4 J	18.4 J	242 J	253 J	27.6 J	103 J	35.2 J	3090 J
Cyanide								3.2

TABLE 1
BRISTOL LABORATORIES SITE
VOLATILE ORGANIC ANALYSIS
WATER DATA SUMMARY

	Sample Location								
Compound	MW-1B	MW-2B	MW-3B	Ground Water Regulatory Limits	SW-1	SW-2	Class D Surface Water Regulatory Limits	FB	TB
Chloromethane	<10	<10	<10	–	<10	2J	–	<10	<10
Bromomethane	<10	<10	<10	5S	<10	<10	–	<10	<10
Vinyl Chloride	<10	<10	<10	2S	<10	<10	–	<10	<10
Chloroethane	<10	<10	<10	5S	<10	<10	–	<10	<10
Methylene Chloride	<5	<5	<5	5S	<5	<5	–	<5	<5
Acetone	<10	<10	5J	–	10	61	–	<10	<10
Carbon Disulfide	<5	<5	<5	–	<5	<5	–	<5	<5
1,1-Dichloroethene	<5	<5	<5	5S	<5	<5	–	<5	<5
1,1-Dichloroethane	7	<5	9	5S	<5	<5	–	<5	<5
1,2-Dichloroethene (total)	<5	<5	<5	5S	<5	<5	–	<5	<5
Chloroform	<5	<5	<5	100S	<5	<5	–	<5	<5
1,2-Dichloroethane	<5	<5	<5	5S	<5	<5	–	<5	<5
2-Butanone	<10	<10	<10	–	<10	<10	–	<10	<10
1,1,1-Trichloroethane	13	<5	2J	5S	<5	<5	–	<5	<5
Carbon Tetrachloride	<5	<5	<5	5S	<5	<5	–	<5	<5
Bromodichloromethane	<5	<5	<5	50S	<5	<5	–	<5	<5
1,2 Dichloropropane	<5	<5	<5	–	<5	<5	–	<5	<5
cis-1,3-Dichloropropene	<5	<5	<5	5S	<5	<5	–	<5	<5
Trichloroethene	<5	<5	<5	5S	<5	<5	–	<5	<5
Dibromochloromethane	<5	<5	<5	50S	<5	<5	–	<5	<5
1,1,2-Trichloroethane	<5	<5	<5	5S	<5	<5	–	<5	<5
Benzene	<5	<5	5J	ND S	<5	<5	6G	<5	<5
trans-1,3 Dichloropropene	<5	<5	<5	–	<5	<5	–	<5	<5
Bromoform	<5	<5	<5	50G	<5	<5	–	<5	<5
4-Methyl-2-Pentanone	<10	<10	<10	–	<10	6J	–	<10	<10
2-Hexanone	<10	<10	<10	50G	<10	<10	–	<10	<10
Tetrachloroethene	<5	<5	<5	5S	<5	<5	1G	<5	<5
1,1,2,2-Tetrachloroethane	<5	<5	1J	5S	<5	<5	–	<5	<5
Toluene	<5	<5	<5	5S	<5	<5	–	<5	<5
Chlorobenzene	<5	<5	<5	5S	<5	<5	50S	<5	<5
Ethylbenzene	<5	<5	1J	5S	<5	<5	–	<5	<5
Styrene	<5	<5	<5	5S	<5	<5	–	<5	<5
Xylene (total)	<5	<5	<5	5S	<5	<5	–	<5	<5

ts = micrograms/liter (ppb)
: Guidance values based on the New York State Ambient Water Quality Standard and Guidance Values.
Standard valued based on the New York State Ambient Water Quality Standard and Guidance Values.
Estimated Value
:ded indicates detectable concentration above laboratory detection limit.

TABLE 2

BRISTOL LABORATORIES SITE
SEMIVOLATILE ORGANIC ANALYSIS
WATER DATA SUMMARY

	Sample Location							
Compound	MW-1B	MW-2B	MW-3B	Ground Water Regulatory Limits	SW-1	SW-2	Class D Surface Water Regulatory Limits	FB
Phenol	<10	<10	<10	1.0S	<10	<10	1.0S	<10
bis(2-Chloroethyl)ether	<10	<10	<10	1.0S	<10	<10	–	<10
2-Chlorophenol	<10	<10	<10	–	<10	<10	–	<10
1,3-Dichlorobenzene	<10	<10	<10	5S	<10	<10	50S	<10
1,4-Dichlorobenzene	<10	<10	<10	4.7S	<10	<10	50S	<10
1,2-Dichlorobenzene	<10	<10	<10	4.7S	<10	<10	50S	<10
2-Methylphenol	<10	<10	<10	–	<10	<10	–	<10
bis(2 chloroisopropyl)ether	<10	<10	<10	–	<10	<10	–	<10
N-Nitroso-Di-n-propylamine	<10	<10	<10	–	<10	<10	–	<10
Hexachloroethane	<10	<10	<10	5S	<10	<10	–	<10
Nitrobenzene	<10	<10	<10	5S	<10	<10	–	<10
Isophorone	<10	<10	<10	50S	<10	<10	–	<10
2-Nitrophenol	<10	<10	<10	–	<10	<10	–	<10
2,4-Dimethylphenol	<10	<10	<10	–	<10	<10	–	<10
bis(2-Chloroethoxy)methane	<10	<10	<10	5S	<10	<10	–	<10
2,4-Dichlorophenol	<10	<10	<10	1.0S	<10	<10	1.0S	<10
1,2,4-Trichlorobenzene	<10	<10	<10	5S	<10	<10	50S	<10
Napthalene	<10	<10	<10	10G	<10	<10	–	<10
4-Chloroaniline	<10	<10	<10	5S	<10	<10	5S	<10
Hexachlorobutadiene	<10	<10	<10	5S	<10	<10	10S	<10
4-Chloro-3-methylphenol	<10	<10	<10	–	<10	<10	–	<10
2-Methylnapthalene	<10	<10	<10	–	<10	<10	–	<10
Hexachlorocyclopentadiene	<10	<10	<10	5S	<10	<10	4.5S	<10
2,4,6-Trichlorophenol	<10	<10	<10	–	<10	<10	–	<10
2,4,5-Trichlorophenol	<25	<24	<25	–	<25	<26	–	<25
2-Chloronaphthalene	<10	<10	<10	5G	<10	<10	–	<10
2-Nitroaniline	<25	<24	<25	–	<25	<26	–	<25
Dimethylphthalate	<10	<10	<10	50S	<10	<10	–	<10
Acenaphthylene	<10	<10	<10	20G	<10	<10	–	<10
3-Nitroaniline	<25	<24	<25	–	<25	<26	–	<25
Acenaphthene	<10	<10	<10	20G	<10	<10	–	<10
2,4-Dinitrophenol	<25	<24	<25	–	<25	<26	–	<25
4-Nitrophenol	<25	<24	<25	–	<25	<26	–	<25

'S = micrograms/liter (ppb)
Guidance values based on the New York State Ambient Water Quality Standard and Guidance Values.
Standard valued based on the New York State Ambient Water Quality Standard and Guidance Values.
ded indicates detectable concentration above laboratory detection limit.

TABLE 3

BRISTOL LABORATORIES SITE
PESTICIDE ORGANICS ANALYSIS
WATER DATA SUMMARY

	Sample Location							
Compound	MW-1B	MW-2B	MW-3B	Ground Water Regulatory Limits	SW-1	SW-2	Class D Surface Water Regulatory Limits	FB
alpha-BHC	<.05	<.05	<.24	–	<.05	<.05	–	<.05
beta-BHC	<.05	<.05	<.24	–	<.05	<.05	–	<.05
delta-BHC	<.05	<.05	<.24	–	<.05	<.05	–	<.05
gamma-BHC (Lindane)	<.05	<.05	<.24	–	<.05	<.05	–	<.05
Heptachlor	<.05	<.05	<.24	ND S	<.05	<.05	.001S	<.05
Aldrin	<.05	<.05	<.24	–	<.05	<.05	.0001G	<.05
Heptachlor epoxide	<.05	<.05	<.24	ND S	<.05	<.05	.001S	<.05
Endosulfan I	<.05	<.05	<.24	–	<.05	<.05	–	<.05
Dieldrin	<.10	<.10	<.48	ND S	<.10	<.10	.0001S	<.10
4,4'-DDE	<.10	<.10	<.48	ND S	<.10	<.10	.001S	<.10
Endrin	<.10	<.10	<.48	ND S	<.10	<.10	.002S	<.10
Endosulfin II	<.10	<.10	<.48	–	<.10	<.10	–	<.10
4,4'-DDD	<.10	<.10	<.48	ND S	<.10	<.10	.001S	<.10
Endosulfan sulfate	<.10	<.10	<.48	35	<.10	<.10	–	<.10
4,4'-DDT	<.10	<.10	<.48	ND S	<.10	<.10	.001S	<.10
Methoxychlor	<.48	<.48	<2.4	–	<.48	<.48	–	<.51
Endrin ketone	<.10	<.10	<.48	–	<.10	<.10	–	<.10
Endrin aldehyde	<.10	<.10	<.48	–	<.10	<.10	–	<.05
alpha-chlorodane	<.05	<.05	<.24	–	<.05	<.05	–	<.05
gamma-chlorodane	<.05	<.05	<.24	–	<.05	<.05	–	<5.1
Toxaphene	<4.8	<4.8	<24	ND S	<4.8	<4.8	1.6S	<1.0
Aroclor-1016	<.96	<.97	<4.8	.1S	<.97	<.96	.001S	<1.0
Aroclor-1221	<.96	<.97	<4.8	.1S	<.97	<.96	.001S	<1.0
Aroclor-1232	<.96	<.97	<4.8	.1S	<.97	<.96	.001S	<1.0
Aroclor-1242	<.96	<.97	<4.8	.1S	<.97	<.96	.001S	<1.0
Aroclor-1248	<.96	<.97	<4.8	.1S	<.97	<.96	.001S	<1.0
Aroclor-1254	<.96	<.97	<4.8	.1S	<.97	<.96	.001S	<1.0
Aroclor-1260	<.96	<.97	<4.8	.1S	<.97	<.96	.001S	<1.0

; = micrograms/liter (ppb)
uideline values based on the New York State Ambient Water Quality Standard and Guidance Values
uideline values based on the New York State Ambient Water Quality Standard and Guidance Values
d indicates detectable concentration above laboratory detection limit.

TABLE 4

BRISTOL LABORATORIES SITE
INORGANIC ANALYSIS
WATER DATA SUMMARY

	Sample Location							
ompound	MW-1B	MW-2B	MW-3B	Ground Water Regulatory Limits	SW-1	SW-2	Class D Surface Water Regulatory Limits	FB
Aluminum	481	1190	109	–	68	66	–	<25
ntimony	2.2	2.9	2.6	3G	5.1	3.8	–	4.7
Arsenic	<1.0	2.7	1.5	25S	2.8	1.4	–	<1.0
arium	41.0	127	106	1000S	85.0	85	–	<2.0
Beryllium	<1.0	<1.0	<1.0	3G	<1.0	<1.0	–	<1.0
Cadmium	<3.0	<3.0	<3.0	10S	<3.0	<3.0	–	<3.0
Calcium	87,000	221,000	265,000	–	185,000	182,000	–	<27.0
Chromium	<3.0	5.0	5.0	50S	4.0	<3.0	–	<3.0
Cobalt	<4.0	6.0	8.0	–	<4.0	<4.0	110G	<4.0
Copper	50	114	65.0	200S	102	84.0	–	69
on	534	5850	<10	300S	32.0	11.0	300S	253
Lead	<1.0	1.0	<1.0	25S	1.3	1.5	–	<1.0
Magnesium	15,500	64,300	58,000	35,000G	30,100	29,400	–	56.0
Manganese	535	1090	7630	300S	136	123	–	3.0
Mercury	<.10	<.10	<.10	2S	<.10	<.10	.2G	<.10
Nickel	44	47.0	26.0	–	43.0	20	–	10
Potassium	3350	2630	1040	–	4940	4780	–	<211
Selenium	<2.0	<2.0	<2.0	10	<2.0	<2.0	–	<2.0
Silver	<5.0	<5.0	<5.0	50S	<5.0	<5.0	–	<5.0
Sodium	156,000	203,000	182,000	20,000G	131,000	135,000	–	195
Thallium	<1.0	<1.0	<1.0	4G	<5.0	<1.0	20S	<1.0
Vanadium	<6.0	<6.0	<6.0	–	<6.0	<6.0	190S	<6.0
Zinc	55	148	53.0	300S	146	102	–	69
Cyanide	<10.0	<10.0	<10.0	100S	<10.0	<10.0	22S free cyanide	<10.0

rS = micrograms/liter (ppb)
= Guidance values based on the New York State Ambient Water Quality Standard and Guidance Values
= Guidance values based on the New York State Ambient Water Quality Standard and Guidance Values
ded indicates detectable concentration above laboratory detection limit.

TABLE 5

BRISTOL LABORATORIES SITE
VOLATILE ORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location							
	BG-1	MW-1B (10-12')	MW-2B (10-12')	MW-3B (5-7')	TP-1	TP-2	TP-3	TP-4
Chloromethane	<11	<13	<12	<11	<58	<11	<11	<11
Bromomethane	<11	<13	<12	<11	<58	<11	<11	<11
Vinyl Chloride	<11	<13	<12	<11	<58	<11	<11	<11
Chloroethane	<11	<13	<12	<11	<58	<11	<11	<11
Methylene Chloride	8	<6	<6	<6	<29	<6	<6	<6
Acetone	<11	<13	<12	<11	150	31	<11	19
Carbon Disulfide	<6	<6	<6	<6	<29	<6	<6	<6
1,1-Dichloroethene	<6	<6	<6	<6	<29	<6	<6	<6
1,1-Dichloroethane	<6	<6	<6	<6	<29	<6	<6	<6
1,2-Dichloroethene (total)	<6	<6	<6	<6	<29	<6	<6	22
Chloroform	<6	<6	<6	<6	<29	<6	<6	<6
1,2-Dichloroethane	<6	<6	<6	<6	<29	<6	<6	<6
2-Butanone	<11	<13	<12	<11	<58	<11	<11	<11
1,1,1-Trichloroethane	<6	<6	<6	<6	<29	<6	<6	<6
Carbon Tetrachloride	<6	<6	<6	<6	<29	<6	<6	<6
Bromodichloromethane	<6	<6	<6	<6	<29	<6	<6	<6
1,2 Dichloropropane	<6	<6	<6	<6	<29	<6	<6	<6
cis-1,3-Dichloropropene	<6	<6	<6	<6	<29	<6	<6	<6
Trichloroethene	<6	<6	<6	<6	<29	<6	<6	<6
Dibromochloromethane	<6	<6	<6	<6	<29	<6	<6	<6
1,1,2-Trichloroethane	<6	<6	<6	<6	<29	<6	<6	<6
Benzene	<6	<6	<6	<6	<29	<6	<6	<6
trans-1,3 Dichloropropene	<6	<6	<6	<6	<29	<6	<6	<6
Bromoform	<6	<6	<6	<6	<29	<6	<6	<6
4-Methyl-2-Pentanone	<11	<13	<12	<11	<58	<11	<11	<11
2-Hexanone	<11	<13	<12	<11	<58	<11	<11	<11
Tetrachloroethene	<6	<6	<6	<6	<29	<6	<6	<6
1,1,2,2-Tetrachloroethane	<6	<6	<6	<6	<29	<6	<6	<6
Toluene	<6	<6	<6	<6	<29	<6	<6	<6
Chlorobenzene	<6	<6	<6	<6	<29	<6	<6	<6
Ethylbenzene	<6	<6	<6	<6	<29	<6	<6	<6
Styrene	<6	<6	<6	<6	<29	<6	<6	<6
Xylene (total)	<6	<6	<6	<6	<29	<6	<6	<6

NITS = micrograms/kilogram (ppb)
aded indicates detectable concentration above laboratory detection limit.

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TABLE 5
(Cont'd)
BRISTOL LABORATORIES SITE
VOLATILE ORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location			
	TB-1	TB-2	FB-1	Recommended Cleanup Guidlines [1]
Chloromethane	<10	<10	<10	–
Bromomethane	<10	<10	<10	–
Vinyl Chloride	<10	<10	<10	200
Chloroethane	<10	<10	<10	1,900
Methylene Chloride	<5	<5	<5	100
Acetone	<10	<10	25	200
Carbon Disulfide	<5	<5	<5	2,700
1,1-Dichloroethene	<5	<5	<5	400
1,1-Dichloroethane	<5	<5	<5	200
1,2-Dichloroethene (total)	<5	<5	<5	300
Chloroform	<5	<5	<5	300
1,2-Dichloroethane	<5	<5	<5	100
2-Butanone	<10	<10	<10	300
1,1,1-Trichloroethane	<5	<5	<5	800
Carbon Tetrachloride	<5	<5	<5	600
Bromodechloromethane	<5	<5	<5	–
1,2 Dichloropropane	<5	<5	<5	–
cis-1,3-Dichloropropene	<5	<5	<5	300
Trichloroethene	<5	<5	<5	700
Dibromochloromethane	<5	<5	<5	–
1,1,2-Trichloroethane	<5	<5	<5	800
Benzene	<5	<5	<5	60
trans-1,3 Dichloropropene	<5	<5	<5	300
Bromoform	<5	<5	<5	–
4-Methyl-2-Pentanone	<10	<10	<10	1,000
2-Hexanone	<10	<10	<5	–
Tetrachloroethene	<5	<5	<5	1,400
1,1,2,2-Tetrachloroethane	<5	<5	<5	600
Toluene	<5	<5	<5	1,500
Chlorobenzene	<5	<5	<5	1,700
Ethylbenzene	<5	<5	<5	5,500
Styrene	<5	<5	<5	–
Xylene (total)	<5	<5	<5	1,200

NITS = micrograms/liter (ppb) Shaded indicates detectable concentration above laboratory detection limit.
B = Trip Blank; FB = Field Blank
' = Technical and Administrative Guidance Memorandum, NYSDEC, November 1992, Determination of Soil Cleanup Objectives and Cleanup Levels.

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TABLE 6

BRISTOL LABORATORIES SITE
SEMIVOLATILE ORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location								
	BG-1	FB-1	MW-1B	MW-2B	MW-3B	TP-1	TP-2	TP-3	TP-4
Phenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
bis(2-Chloroethyl)ether	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2-Chlorophenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
1,3-Dichlorobenzene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
1,4-Dichlorobenzene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
1,2-Dichlorobenzene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2-Methylphenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
bis(2 chloroisopropyl)ether	<3700	<10	<420	<410	<380	<750	<760	<810	<750
N-Nitroso-Di-n-propylamine	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Hexachloroethane	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Nitrobenzene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Isophorone	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2-Nitrophenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2,4-Dimethylphenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
bis(2-Chloroethoxy)methane	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2,4-Dichlorophenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
1,2,4-Trichlorobenzene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Napthalene	<3700	<10	<420	<410	380	<750	42J	<810	<750
4-Chloroaniline	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Hexachlorobutadiene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
4-Chloro-3-methylphenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2-Methylnapthalene	<3700	<10	24J	<410	65	<750	48J	<810	<750
Hexachlorocyclopentadiene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2,4,6-Trichlorophenol	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2,4,5-Trichlorophenol	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800
2-Chloronaphthalene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2-Nitroaniline	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800
Dimethylphthalate	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Acenaphthylene	<3700	<10	<420	<410	36.5J	<750	39J	<810	<750
3-Nitroaniline	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800
Acenaphthene	<245	<10	<420	<410	130J	<750	70J	<810	<750
2,4-Dinitrophenol	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800
4-Nitrophenol	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800

UNITS = micrograms/kilogram (ppb)
FB = Field Blank
aded indicates detectable concentration above laboratory detection limit.

TABLE 6
(Cont'd)
BRISTOL LABORATORIES SITE
SEMIVOLATILE ORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location								
	BG-1	FB-1	MW-1B	MW-2B	MW-3B	TP-1	TP-2	TP-3	TP-4
Dibenzofuran	285J	<10	<420	<410	<380	<750	49.5J	<810	<750
2,4-Dinitrotoluene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
2,6-Dinitrotoluene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Diethylphthalate	<3700	<10	<420	<410	<380	<750	<760	<810	<750
4-Chlorophenyl-phenylether	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Fluorene	650J	<10	34J	35.5J	210	<750	105	<810	<750
4-Nitroaniline	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800
4,6-Dinitro-2-methylphenol	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800
N-Nitrosodiphenylamine	<3700	<10	<420	<410	<380	<750	<760	<810	<750
4-Bromophenyl-phenylether	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Hexachlorobenzene	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Pentachlorophenol	<9500	<26	<1000	<1000	<950	<1900	<1900	<2000	<1800
Phenanthrene	5500	<10	205J	250	1450	<750	1050	260J	225J
Carbazole	215J	<10	<420	<410	85J	<750	95J	<810	<750
Anthracene	1350J	<10	47J	31J	310	<750	155J	<810	47J
Di-n-Butylphthalate	<3700	1J	<420	<410	<380	750	760	810	750
Fluoranthene	11,000	<10	245	420	1850	60J	1750	410	420
Pyrene	13,000	<10	265	485	2050	60J	2000	395J	480
Butylbenzylphthalate	<3700	<10	<420	<410	<380	<750	<760	<810	<750
3,3'-Dichlorobenzidine	<3700	<10	<830	<410	<380	<750	<760	<810	<750
Benzo(a)Anthracene	6500	<10	115J	185J	1100	<750	900	165J	225J
Bis(2-Ethylhexyl)Phthalate	195J	10	26.5J	36.5J	55J	<750	48.5J	<810	60J
Chrysene	5500	<10	125J	225	1050	<750	900	210J	260J
Di-n-octylphthalate	<3700	<10	<420	<410	<380	<750	<760	<810	<750
Benzo(b)Fluoranthene	4400	<10	85J	145J	800	<750	700	130J	[illegible]J
Benzo(k)Fluoranthene	4800	<10	110J	160J	650	<750	900	125J	[illegible]J
Benzo(a)Pyrene	4950	<10	100J	160J	900	<750	750	110J	225J
Indeno(1,2,3,-cd)Pyrene	3650	<10	50J	85J	900	<750	480	<810	160J
Dibenzo(a,h)Anthracene	1700J	<10	<420	<410	380	<750	255J	<810	<750
Benzo(g,h,i)Perylene	3350	<10	55J	95J	1100	<750	500	<810	175J

UNITS = micrograms/kilogram (ppb)
FB = Field Blank
[illegible]aded indicates detectable concentration above laboratory detection limit.

TABLE 6
(Cont'd)
BRISTOL LABORATORIES SITE
SEMIVOLATILE ORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location								
	TP-6	TP-7	TP-8	TP-9	TP-10	WS-1	WS-2	WS-3	Recommended Cleanup Guidelines [1]
Phenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	30 or MDL
bis(2-Chloroethyl)ether	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2-Chlorophenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	800
1,3-Dichlorobenzene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
1,4-Dichlorobenzene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
1,2-Dichlorobenzene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2-Methylphenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	100 or MDL
bis(2 chloroisopropyl)ether	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
N-Nitroso-Di-n-propylamine	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
Hexachloroethane	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
Nitrobenzene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	200 or MDL
Isophorone	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2-Nitrophenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	330 or MDL
2,4-Dimethylphenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
bis(2-Chloroethoxy)methane	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2,4-Dichlorophenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	400
1,2,4-Trichlorobenzene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
Napthalene	<390	19,000	7000	<380	3900	44J	600	460	13,000
4-Chloroaniline	<390	<19,000	<2900	<380	<2100	<770	<380	<680	220 or MDL
Hexachlorobutadiene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
4-Chloro-3-methylphenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	240 or MDL
2-Methylnapthalene	26J	1700J	600J	<380	385J	44J	75J	150J	36,400
Hexachlorocyclopentadiene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2,4,6-Trichlorophenol	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2,4,5-Trichlorophenol	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	100
2-Chloronaphthalene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2-Nitroaniline	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	430 or MDL
Dimethylphthalate	<390	<19,000	<2900	<380	<2100	<770	<380	<680	2,000
Acenaphthylene	<390	2550J	900J	28J	34J	<770	60J	195J	41,000
3-Nitroaniline	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	500 or MDL
Acenaphthene	<390	5500J	195J	47J	340J	210J	50J	44J	50,000
2,4-Dinitrophenol	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	200 or MDL
4-Nitrophenol	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	100 or MDL

ilTS = micrograms/kilogram (ppb)
aded indicates detectable concentration above laboratory detection limit.
DL = Method Detection Limit

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TABLE 6
(Cont'd)
BRISTOL LABORATORIES SITE
SEMIVOLATILE ORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location								
	TP-6	TP-7	TP-8	TP-9	TP-10	WS-1	WS-2	WS-3	Recommended Cleanup Guidelines
Dibenzofuran	<390	3650	<2900	34J	255J	110J	37J	80J	6,200
2,4-Dinitrotoluene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
2,6-Dinitrotoluene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	1,000
Diethylphthalate	<390	<19,000	<2900	33J	<2100	<770	<380	<680	7,100
4-Chlorophenyl-phenylether	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
Fluorene	<390	10,500	220	85J	700J	210J	80J	145J	50,000
4-Nitroaniline	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	–
4,6-Dinitro-2-methylphenol	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	–
N-Nitrosodiphenylamine	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
4-Bromophenyl-phenylether	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
Hexachlorobenzene	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
Pentachlorophenol	<950	<47,000	<7000	<950	<5000	<2000	<950	<1700	1,000 or MDL
Phenanthrene	130J	67,500	4600	900	6000	1350	600	2000	50,000
Carbazole	<390	8000J	460J	110J	650J	140J	65J	150J	–
Anthracene	<390	16,000	495J	155J	1250	335J	6J	350	50,000
Di-n-Butylphthalate	<390	<19,000	<2900	380	<2100	770	<380	<680	8,100
Fluoranthene	370	96,500	8000	1450	10,000	1950	900	3000	50,000
Pyrene	395	105,500	10,000	2400	10,500	2150	1050	3350	50,000
Butylbenzylphthalate	<390	<19,000	<2900	<380	<2100	95J	<380	55J	50,000
3,3'-Dichlorobenzidine	<390	<19,000	<2900	<380	<2100	<770	<380	<680	–
Benzo(a)Anthracene	215	49,000	4150	850	6000	950	450	1400	220 or MDL
Bis(2-ethylhexyl)Phthalate	<390	<19,000	<2900	75J	<2100	50J	120J	250	50,000
Chrysene	230	47,000	5500	900	6000	900	500	1500	400
Di-n-octylphthalate	<390	<19,000	<2900	<380	<2100	<770	<380	<680	50,000
Benzo(b)Fluoranthene	190J	37,500	3800	750	4200	700	355	1150	1,100
Benzo(k)Fluoranthene	230	45,000	3350	800	4050	750	380	1300	1,100
Benzo(a)Pyrene	220	40,500	4300	850	4550	750	415	1300	61 or MDL
Indeno(1,2,3,-cd)Pyrene	160J	25,000	4750	600	4050	500	320	1000	3,200
Dibenzo(a,b)Anthracene	80J	13,000	2000	310	1850	265J	145J	460	14 or MDL
Benzo(g,h,i)Perylene	160J	24,000	4750	650	4700	550	355	1000	50,000

NITS = micrograms/kilogram (ppb)
= Estimated Value
= Technical and Administrative Guidance Memorandum, NYSDEC, November 1992, Determination of Soil Cleanup Objectives and Cleanup Levels.
DL = Method Detection Limit
aded indicates detectable concentration above laboratory detection limit.

TABLE 7

BRISTOL LABORATORIES SITE
PESTICIDE/PCB ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location									
	BG-1	FB-1	MW-1B	MW-2B	MW-3B	TP-1	TP-2	TP-3	TP-4	TP-6
alpha-BHC	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
beta-BHC	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
delta-BHC	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
gamma-BHC (Lindane)	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
Heptachlor	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
Aldrin	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
Heptachlor epoxide	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
Endosulfan I	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
Dieldrin	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<1.9
4,4'-DDE	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<1.9
Endrin	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Endosulfin II	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
4,4'-DDD	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Endosulfan sulfate	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
4,4'-DDT	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Methoxychlor	<110	<.26	<21	<20	<57	<19	<120	<120	<19	<19
Endrin ketone	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Endrin aldehyde	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
alpha-chlorodane	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	<12	<1.9	<1.9
gamma-chlorodane	<11	<.03	<2.1	<2.0	<5.7	<1.9	<12	13	<1.9	<1.9
Toxaphene	<110	<.26	<21	<20	<57	<19	<120	<120	<19	<19
Aroclor-1016	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Aroclor-1221	<44	<.10	<8.3	<8.1	<23	<7.5	<46	<49	<7.6	<7.7
Aroclor-1232	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Aroclor-1242	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Aroclor-1248	<22	<.05	<4.2	<4.0	<11	<3.8	<23	480	<3.8	<3.8
Aroclor-1254	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8
Aroclor-1260	<22	<.05	<4.2	<4.0	<11	<3.8	<23	<24	<3.8	<3.8

UNITS = micrograms/kilogram (ppb)
FB = Field Blank
Shaded indicates detectable concentration above laboratory detection limit.

TABLE 7
(Cont'd)
BRISTOL LABORATORIES SITE
PESTICIDE/PCB ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location							
	TP-7	TP-8	TP-9	TP-10	WS-1	WS-2	WS-3	Recommended Cleanup Guidelines [1]
alpha-BHC	<5.6	<8.6	<1.9	<6.2	<2.0	<1.9	<10	110
beta-BHC	<5.6	<8.6	<1.9	<6.2	<2.0	<1.9	<10	200
delta-BHC	<5.6	<8.6	<1.9	<6.2	<2.0	<1.9	<10	300
gamma-BHC (Lindane)	<5.6	<8.6	<1.9	<6.2	3.1	<1.9	<10	60
Heptachlor	9.4	<8.6	<1.9	<6.2	6.9	<1.9	<10	100
Aldrin	<5.6	<8.6	<1.9	<6.2	<2.0	<1.9	<10	41
Heptachlor epoxide	30	<8.6	<1.9	18	<2.0	<1.9	<10	20
Endosulfan I	<5.6	<8.6	<1.9	<6.2	<2.0	<1.9	<10	900
Dieldrin	<11	<17	<3.8	<12	<3.9	<3.9	<20	44
4,4'-DDE	<11	<17	<3.8	<12	<3.9	<3.9	<20	2,100
Endrin	<11	<17	<3.8	<12	<3.9	<3.9	<20	100
Endosulfan II	27	<17	<3.8	<12	<3.9	<3.9	<20	900
4,4'-DDD	<11	<17	<3.8	37	<3.9	<3.9	<20	2,900
Endosulfan sulfide	<11	<17	<3.8	<12	<3.9	<3.9	<20	1,000
4,4'-DDT	<11	32	<3.8	52	4.6	<3.9	<20	2,100
Methexychlor	200	100	<19	68	<20	<19	<100	10,000
Endrine ketone	<11	<17	<3.8	<12	<3.9	<3.9	<20	--
Endrin aldehyde	<11	<17	<3.8	<12	<3.9	<3.9	<20	--
alpha-chlorodane	<5.6	<8.6	<1.9	<6.2	<2.0	<1.9	<10	--
gamma-chlorodane	<5.6	<8.6	<1.9	<6.2	2.4	<1.9	<10	54
Toxaphene	<56	<86	<19	<62	<20	<19	<100	--
Aroclor-1016	<11	<17	<3.8	<12	<3.9	<3.9	<20	1,000
Aroclor-1221	<22	<34	<7.5	<25	<7.9	<7.7	<41	1,000
Aroclor-1232	<11	<17	<3.8	<12	<3.9	<3.9	<20	1,000
Aroclor-1242	<11	<17	<3.8	<12	<3.9	<3.9	<20	1,000
Aroclor-1248	<11	<17	<3.8	<12	300	<3.9	<20	1,000
Aroclor-1254	<11	<17	<3.8	<12	<3.9	<3.9	<20	1,000
Aroclor-1260	<11	<17	<3.8	<12	<3.9	<3.9	<20	1,000

ITS = micrograms/kilogram (ppb)
= Estimated Value
plicate analyses performed for TP-7 and WS-1
= Technical and Administrative Guidance Memorandum, NYSDEC, November 1992, Determination of Soil Cleanup Objectives and Cleanup Levels.
aded indicates detectable concentration above laboratory detection limit.

TABLE 8

BRISTOL LABORATORIES SITE
INORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location								
	BG-1	FB-1	MW-1B (10-12')	MW-2B (10-12')	MW-3B (5-7')	TP-1	TP-2	TP-3	TP-4
Aluminum	6130	46	8580	5040	4100	6230	6190	7230	6,560
Antimony	<0.8	1.2	<.09	<.09	<.09	<0.11	.045	<0.10	<0.08
Arsenic	5.2	<1.0	5.1	3.4	5.0	2.2	6.1	3.5	4.2
Barium	52.7	23	232	259	43.3	50.2	111	41.7	59.4
Beryllium	.42	<1.0	0.65	0.28	0.34	0.42	0.50	0.58	0.50
Cadmium	<0.25	6	<0.28	<0.28	<0.26	<0.32	1.3	<0.29	0.25
Calcium	67,900	20,700	76,600	61,300	105,000	67,300	86,700	45,100	59,100
Chromium	10.6	<3.0	15.6	9.1	7.7	10.5	20.5	13.8	11.1
Cobalt	5.5	4.0	7.6	6.3	3.3	5.2	5.4	6.1	5.4
Copper	17.1	<4.0	46.4	13.8	11.6	13.0	208	33.8	17.4
Iron	12,400	16	17,100	11,200	8,230	11,500	13,200	13,300	12,800
Lead	29.2	4.8	27.6	16	17	14.1	86	13.3	15.4
Magnesium	25,900	10,300	21,400	25,600	43,400	28,900	18,900	18,500	22,400
Manganese	428	6.0	370	316	246	362	228	415	387
Mercury	<0.5	<0.10	<0.05	<0.06	<0.05	<0.05	0.39	0.42	<0.05
Nickel	10.8	28	19.1	10.7	8.0	10.8	18.4	16.8	11.2
Potassium	1,140	1,120	1,320	736	521	1,050	819	1,260	1,150
Selenium	<0.18	<2.0	<0.25	<0.17	<0.16	<0.18	0.26	<0.17	<0.17
Silver	<0.42	<5.0	<0.47	<0.47	<0.43	<0.53	0.92	<0.48	<0.42
Sodium	267	2,320	479	326	405	348	456	340	286
Thallium	<0.18	<2.0	<0.25	<0.17	<0.16	<0.18	<0.19	<0.17	<0.17
Vanadium	11.9	<6.0	13.4	7.8	10.4	10.4	13.8	12.9	13.7
Zinc	42.3	19	60.8	28.0	27.2	31.4	279	71.3	39.4
Cyanide	<1.1	<10	<1.2	<1.2	<1.1	<1.3	<1.2	<1.2	<1.1

Units = micrograms/kg (ppb)
FB = Field Blank
Shaded indicates detectable concentration above laboratory detection limit.

TABLE 8
(Cont'd)
BRISTOL LABORATORIES SITE
INORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location								
	TP-6	TP-7	TP-8	TP-9	TP-10	WS-1	WS-2	WS-3	Recommended Cleanup Guidelines [1]
Aluminum	2,940	3,340	11,800	4,730	6,580	7,460	6,970	3,820	30,000
Antimony	<0.12	4.2	0.56	<0.09	<0.11	<0.09	<0.09	4.9	30,000
Arsenic	8.4	12.6	23.9	5.2	7.4	7.2	3.6	36.5	7,500
Barium	75.9	81.1	134	42.8	84.8	67.1	50.8	79.1	300,000
Beryllium	0.96	0.47	1.1	0.28	0.55	0.56	0.44	4.0	140
Cadmium	<0.36	0.83	1.8	0.28	0.55	0.47	<0.26	30.6	100
Calcium	11,200	96,000	22,200	77,200	42,200	58,100	61,300	4,670	BG
Chromium	6.6	33.6	39.5	8.4	11.3	12.2	11.6	738	10,000
Cobalt	5.4	3.9	10.7	4.6	6.1	7.6	6.7	9.1	30,000
Copper	36.4	101	194	17.7	32.8	23.3	17.5	19.5	25,000
Iron	15,300	11,100	22,800	10,300	21,100	14,000	13,400	195,000	2,000,000
Lead	8.3	626	116	15.0	224	37.4	12.3	131	30,000
Magnesium	4,040	19,800	11,900	29,000	19,400	24,500	29,400	446	BG
Manganese	83.5	288	444	367	630	334	374	573	BG
Mercury	<0.06	0.23	0.97	<0.05	0.09	<0.05	<0.05	0.34	100
Nickel	11.1	17.5	26.4	8.9	13.4	15.2	11.9	55.1	13,000
Potassium	333	471	1,430	804	950	823	969	436	4,000,000
Selenium	0.48	<0.21	1.7	<0.22	<0.20	<0.23	<0.20	3.8	2,000
Silver	<0.60	3.2	2.4	<0.47	<0.55	<0.47	<0.44	1.0	200,000
Sodium	497	612	1,090	325	656	387	296	99.4	3,000,000
Thallium	<0.19	<0.21	0.44	<0.22	<0.20	<0.23	<0.20	1.1	20,000
Vanadium	13.6	7.9	22.2	8.4	10.9	14.7	11.6	26.7	150,000
Zinc	18.4	242	253	27.6	93.5	103	35.2	3,090	20,000
Cyanide	<1.2	<1.2	<1.7	<1.1	<1.2	<1.1	<1.1	3.2	–

Notes
UNITS = micrograms/kg (ppb)
[1] = Technical and Administrative Guidance Memorandum, NYSDEC, November 1992, Determination of Soil Cleanup Objectives and Cleanup Levels.
Shaded indicates detectable concentration above laboratory detection limit.
BG = Site background

TABLE 9

BRISTOL LABORATORIES SITE
HAZARDOUS WASTE CHARACTERISTICS
EP TOXICITY-METALS
LEACHATE DATA SUMMARY

Compound	Sample Location							
	BG-1	MW-1B (10-12')	MW-2B (10-12')	MW-3B (5-7')	TP-1	TP-2	TP-3	TP-4
Arsenic	<200	<200	<200	271	255	<200	296	<200
Barium	736	998	638	504	1140	638	527	796
Cadmium	<3	6	<3	4	<3	17	3	3
Chromium	4	<3	<3	<3	<3	<3	<3	5
Lead	<23	<23	<23	<23	<23	77	<23	<23
Mercury	<0.10	<0.10	<0.10	<0.10	<0.10	<0.12	<0.10	<0.10
Selenium	<40	<40	<40	<40	<40	<40	<40	<40
Silver	12	7	7	7	17	12	11	17

JNITS = mircograms/liter (ppb)
haded indicates detectable concentration above laboratory detection limit.

BRISTOL LABORATORIES SITE
HAZARDOUS WASTE CHARACTERISTICS
EP TOXICITY-METALS
LEACHATE DATA SUMMARY

Compound	Sample Location								6 NYCRR Part 371 Regulatory Limits
	TP-6 (4-6')	TP-7 (2-4')	TP-8 (2-4')	TP-9 (6-8')	TP-10 (6-8')	WS-1	WS-2	WS-3	
Arsenic	499	215	<200	<200	<200	<200	312	<200	5,000
Barium	233	393	178	365	243	660	416	41	100,000
Cadmium	<3	7	<3	3	4	3	4	12	1,000
Chromium	3	3	<3	3	<3	<3	<3	5	5,000
Lead	<23	62	<23	<23	<23	34	<23	39	5,000
Mercury	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	200
Selenium	<40	<40	<40	<40	<40	<40	<40	<40	1,000
Silver	14	13	11	12	9	16	7	9	5,000

JNITS = micrograms/liter (ppb)
haded indicates detectable concentration above laboratory detection limit.

TABLE 10

BRISTOL LABORATORIES SITE
HAZARDOUS WASTE CHARACTERISTICS
EP TOXICITY-PESTICIDES
LEACHATE DATA SUMMARY

Compound	Sample Location					
	BG-1	MW-1B (10-12')	MW-2B (10-12')	MW-3B (5-7')	TP-1	TP-2
gamma-BHC (Lindane)	<10	<10	<10	<10	<10	<10
Endrin	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methoxychlor	<100	<100	<100	<100	<100	<100
Toxaphene	<10	<10	<10	<10	<10	<10

Compound	Sample Location					
	TP-3	TP-4	TP-6 (4-6')	TP-7 (2-4')	TP-8 (2-4')	TP-9 (6-8')
gamma-BHC (Lindane)	<10	<10	<10	<10	<10	<10
Endrin	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methoxychlor	<100	<100	<100	<100	<100	<100
Toxaphene	<10	<10	<10	<10	<10	<10

Compound	Sample Location				6 NYCRR Part 371 Regulatory Limits
	TP-10 (6-8')	WS-1	WS-2	WS-3	
gamma-BHC (Lindane)	<10	<10	<10	<10	400
Endrin	<0.50	<0.50	<0.50	<0.50	20
Methoxychlor	<100	<100	<100	<100	10,000
Toxaphene	<10	<10	<10	<10	500

NITS = micrograms/liter (ppb)
aded indicates detectable concentration above laboratory detection limit.

TABLE 11

BRISTOL LABORATORIES SITE
HAZARDOUS WASTE CHARACTERISTICS
EP TOXICITY-HERBICIDES
LEACHATE DATA SUMMARY

Compound	Sample Location							
	BG-1	MW-1B (10-12')	MW-2B (10-12')	MW-3B (5-7')	TP-1	TP-2	TP-3	TP-4
2, 4, 5-T	<1.6	<2.0	<2.0	<2.0	<1.6	<1.6	<1.6	<1.6
2, 4-D	<3.2	5.2	6.1	<4.0	<3.2	<3.2	<3.2	<3.2
2, 4, 5-TP (Silvex)	<1.6	<2.0	<2.0	<2.0	<1.6	<1.6	<1.6	<1.6

Compound	Sample Location								6 NYCRR Part 371 Regulatory Limits
	TP-6 (4-6')	TP-7 (2-4')	TP-8 (2-4')	TP-9 (6-8')	TP-10 (6-8')	WS-1	WS-2	WS-3	
2, 4, 5-T	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	—
2, 4-D	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	10,000
2, 4, 5-TP (Silvex)	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	1000

UNITS = micrograms/liter (ppb)
Shaded indicates detectable concentration above laboratory detection limit.

TABLE 12

BRISTOL LABORATORIES SITE
HAZARDOUS WASTE CHARACTERISTICS

Analyte	Sample Location				
	BG-1	TP-1	TP-2	TP-3	TP-4
Corrosivity	7.2 Not Corrosive	7.7 Not Corrosive	8.06 Not Corrosive	7.87 Not Corrosive	7.93 Not Corrosive
Ignitability	Not Ignitable	Not Ignitable	Not Ignitable	Not Ignitable	Not Ignitable
Reactivity-CN	<250	<250	<250	<250	<250
Reactivity-S	<500	<500	<500	<500	<500

Analyte	Sample Location								6 NYCRR Part 371 Regulatory Limits
	TP-6	TP-7	TP-8	TP-9	TP-10	WS-1	WS-2	WS-3	
Corrosivity	7.80 Not Corrosive	7.50 Not Corrosive	8.20 Not Corrosive	8.00 Not Corrosive	7.80 Not Corrosive	7.94 Not Corrosive	8.20 Not Corrosive	7.00 Not Corrosive	Non-Corrosive
Ignitability	Not Ignitable	Not Ignitable	Not Ignitable	Not Ignitable	Not Ignitable	Not Ignitable	Not Ignitable	Not Ignitable	Non-Ignitable
Reactivity-CN	*	*	*	*	*	<250	*	<250	Non-Reactive
Reactivity-S	<500	<500	<500	<500	<500	<500	<500	<500	Non-Reactive

UNITS = miligrams/liter (ppm)
Shaded indicates detectable concentration above laboratory detection limit.
* = Total cyanide was not detected, therefore there is no reactive cyanide.

TABLE 13

BRISTOL LABORATORIES SITE
GROUND WATER AND SOIL SUMMARY

GROUND WATER IMPACTS

Compound	Sample Location	Concentration (ug/L)	Ground Water Standard (ug/L)
1,1 Dichloroethane	MW-1B	7	5
1,1,1 Trichloroethane	MW-1B	13	5
1,1 Dichloroethane	MW-3B	9	5

SOIL IMPACTS

Compound	Sample Location	Concentration (ug/kg)	Recommended Cleanup Guidelines [1] (ug/kg)
Methylene Chloride	TP-8	110	100
1,2 Dichloroethene	TP-8	680	300
Trichloroethene	TP-8	760	700

NOTE:

[1] = Technical and Administrative Guidance Memorandum, NYSDEC, November 1992, Determination of Soil Cleanup Objectives and Cleanup Levels.

APPENDIX B1b

Source: Blasland, Bouck & Lee, Inc. 1994. *Preliminary Site Assessment Supplemental Report: Bristol Laboratories Site NYSDEC Inactive Hazardous Waste Disposal Site No. 734001*. For Bristol-Myers Squibb Company. March 1994.

TABLE 1

BRISTOL LABORATORIES SITE

PSA ADDENDUM NO. 1
VOLATILE ORGANIC ANALYSIS
WATER DATA SUMMARY

Compound	Sample Location					
	AI-MW-1B	AI-MW-2B	AI-MW-3B	TB	FB	Ground Water Regulatory Limits
Chloromethane	10U	10U	10U	10U	10U	--
Bromomethane	10U	10U	10U	10U	10U	5S
Vinyl Chloride	10U	10U	10U	10U	10U	2S
Chloroethane	10U	10U	10U	10U	10U	5S
Methylene Chloride	5U	5U	5U	5U	5U	5S
Acetone	10U	10U	10U	10U	11	--
Carbon Disulfide	5U	5U	5U	5U	4J	--
1,1-Dichloroethene	5U	5U	5U	5U	5U	5S
1,1-Dichloroethane	5	5U	3J	5U	5U	5S
1,2-Dichloroethene (total)	5U	5U	5U	5U	5U	5S
Chloroform	5U	5U	5U	5U	4J	100S
1,2-Dichloroethane	5U	5U	5U	5U	5U	5S
2-Butanone	10U	7J	10U	10U	10	--
1,1,1-Trichloroethane	5	5U	5U	5U	5U	5S
Carbon Tetrachloride	5U	5U	5U	5U	5U	5S
Bromodichloromethane	5U	5U	5U	5U	1J	50S
1,2 Dichloropropane	5U	5U	5U	5U	5U	--
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5S
Trichloroethene	5U	5U	5U	5U	5U	5S
Dibromochloromethane	5U	5U	5U	5U	5U	50S
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5S
Benzene	5U	5U	2J	5U	5U	ND S
trans-1,3 Dichloropropene	5U	5U	5U	5U	5U	--
Bromoform	5U	5U	5U	5U	5U	50G
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	--
2-Hexanone	10U	10U	10U	10U	10U	50G
Tetrachloroethene	5U	5U	5U	5U	5U	5S
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5S
Toluene	5U	5U	5U	5U	5U	5S
Chlorobenzene	5U	5U	5U	5U	5U	5S
Ethylbenzene	5U	5U	5U	5U	5U	5S
Styrene	5U	5U	5U	5U	5U	5S

TABLE 1

BRISTOL LABORATORIES SITE

PSA ADDENDUM NO. 1
VOLATILE ORGANIC ANALYSIS
WATER DATA SUMMARY

Compound	Sample Location					
	AI-MW-1B	AI-MW-2B	AI-MW-3B	TB	FB	Ground Water Regulatory Limits
Xylene (total)	5U	5U	5U	5U	5U	5S

Notes:

Units = micrograms/liter (ppb)
G = Guidance values based on the New York State Ambient Water Quality Standard and Guidance Values.
S = Standard valued based on the New York State Ambient Water Quality Standard and Guidance Values.
J = Indicates an estimated value
U = Indicates the compound was analyzed for but not detected
TB = Trip blank
FB = Field blank
Shaded indicates detectable concentration above laboratory detection limit.

TABLE 2
BRISTOL LABORATORIES SITE
PSA ADDENDUM NO. 1
VOLATILE ORGANIC ANALYSIS
SOIL DATA SUMMARY

Compound	Sample Location			
	AI-SS-1	AI-SS-2	AI-SS-3	Recommended Cleanup Guidelines [1]
Chloromethane	12U	12U	12U	--
Bromomethane	12U	12U	12U	--
Vinyl Chloride	12U	12U	12U	200
Chloroethane	12U	12U	12U	1,900
Methylene Chloride	6U	6U	6U	100
Acetone	30	77	16	200
Carbon Disulfide	6U	6U	1J	2,700
1,1-Dichloroethene	6U	6U	6U	400
1,1-Dichloroethane	6U	6U	6U	200
1,2-Dichloroethene (total)	2J	3J	5J	300
Chloroform	6U	6U	6U	300
1,2-Dichloroethane	6U	6U	6U	100
2-Butanone	10J	16	12U	300
1,1,1-Trichloroethane	6U	6U	6U	800
Carbon Tetrachloride	6U	6U	6U	600
Bromodichloromethane	6U	6U	6U	--
1,2 Dichloropropane	6U	6U	6U	--
cis-1,3-Dichloropropene	6U	6U	6U	300
Trichloroethene	2J	2J	3J	700
Dibromochloromethane	6U	6U	6U	--
1,1,2-Trichloroethane	6U	6U	6U	800
Benzene	6U	6U	1J	60
trans-1,3 Dichloropropene	6U	6U	6U	300
Bromoform	6U	6U	6U	--
4-Methyl-2-Pentanone	12U	12U	12U	1,000
2-Hexanone	12U	12U	12U	--
Tetrachloroethene	6U	6U	2J	1,400
1,1,2,2-Tetrachloroethane	6U	6U	6U	600
Toluene	6U	2J	2J	1,500
Chlorobenzene	6U	6U	6U	1,700
Ethylbenzene	6U	6U	6U	5,500
Styrene	6U	6U	6U	--
Xylene (total)	6U	2J	4J	1,200

UNITS = micrograms/liter (ppb)
I = Indicates an estimated value
J = Indicates the compound was analyzed for but not detected
[1] = Technical and Administrative Guidance Memorandum, NYSDEC, November 1992, Determination of Soil Cleanup Objectives and Cleanup Levels.
Shaded indicates detectable concentration above laboratory detection limit.

TABLE 3

BRISTOL LABORATORIES SITE
PSA ADDENDUM NO. 1

HEADSPACE READINGS (PPM)

Depth Interval (feet)	Soil Samples		
	A1-SS-1	A1-SS-2	A1-SS-3
0-1	2.3	4.6	0.7
1-2	2.7	1.9	0
2-3	1.2	1.0	0.9
3-4	2.2	0	0
4-5	0.6	1.9	0

NOTES:

1. Headspace readings obtained using calibrated photoionization detector used in accordance with the PSA Work Plan.
2. Shaded indicates depth interval selected for laboratory analysis.
3. Background reading: 1.5 ppm.

APPENDIX B2

Source: Parsons Engineering Science, Inc. 1995. *Site Investigation and Remediation Study Report*. For Bristol-Myers Squibb Company. October 1995.

TABLE 4.1

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
GEOPROBE GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	UNITS:	GP01	GP02	GP03	GP04 (MAX)	GP05	GP06	GP07	GP08	GP09
	SAMPLE ID:		GP01	GP02	GP03	GP04 (MAX)	GP05	GP06	GP07	GP08	GP09
	DEPTH:		13-15'	10-12'	14-16'	08.5-13.5'	05.9-15.9'	09.9-14.9'	05-10'	10-15'	04.6-09.6'
	LAB ID:		L23532-1	L23532-2	L23571-2	L23571-6	L23578-3/L23597-5 L23631-2	L23578-4	L23571-1	L23597-1	L23597-2
	SOURCE:		GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
	SDG:		L23532	L23532	L23532	L23532	L23532	L23532	L23532	L23532	L23532
	MATRIX:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	SAMPLED:		05/22/95	05/22/95	05/24/95	05/24/95	05/25/95-5/30/95	05/25/95	05/24/95	05/26/95	05/26/95
	VALIDATED:		8/09/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95
	VOLATILES - METHOD 8010/8020										
67-64-1	Acetone	UG/L									
108-90-7	Chlorobenzene	UG/L									
108-10-1	4-Methyl-2-pentanone	UG/L									
75-09-2	Methylene chloride	UG/L									
108-88-3	Toluene	UG/L									
	VOLATILES - METHOD 8240										
67-64-1	Acetone	UG/L	3 J	3 J	12	10	11 J	110 JD	7 J	-	36
108-10-1	4-Methyl-2-pentanone	UG/L	3 J	-	-	-	-	680 D	-	-	-
75-09-2	Methylene chloride	UG/L	-	-	-	-	10 J	-	-	270000	62
108-88-3	Toluene	UG/L	1 J	1 J	4 J	-	-	-	7	-	4 J
	VOLATILES - METHOD 8015										
67-63-0	Isopropanol	MG/L	-	-	-	-	-	-	-	-	
67-56-1	Methanol	MG/L	-	-	-	-	-	-	-	-	1.5
75-65-1	tert-Butanol	MG/L	-	-	-	-	-	9.2	-	-	-
	SEMIVOLATILES										
83-32-9	Acenaphthene	UG/L									
132-64-9	Dibenzofuran	UG/L									
101-83-7	Dicyclohexylamine	UG/L					-	10 J		8 J	42
86-73-7	Fluorene	UG/L									
91-57-6	2-Methylnaphthalene	UG/L									
85-01-8	Phenanthrene	UG/L									
117-81-7	bis(2-ethylhexyl)phthalate	UG/L									
	INORGANICS										
12027-67-7	Molybdenum	UG/L	23.8 J	44.6 J	3 J	16.3 J	11.5 J	-	155 J	-	6130 J
	OTHERS										
7727-37-9	Ammonia (as N)	MG/L	6.7	17.9	0.22	0.81 J	1.2	2.6	0.26	2.5	2.9
ES-5002	Chemical Oxygen Demand	MG/L	136	211	4.57	13.2	53.8	76.9	8.97	128	138
7757-82-6	Sulfate	MG/L	60.2	-	91.1	178	352	244	60.6	264	544
108-95-2	Total Phenolics	MG/L	0.059	0.059	0.066	0.073	0.066	0.059	0.059	0.081	0.059
7664-38-2	Total Phosphorus	MG/L	-	-	0.08	-	9.8	-	-	0.056	0.43
10-29-7	pH	SU	6.7	6.8	6.8	7.8	7	7.1	8.1	7.5	8.7

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.1

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
GEOPROBE GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	UNITS:	GP10	GP11	GP12	GP13	GP14	GP15	GP16 (MAX)	GP17	GP18
	SAMPLE ID:		GP10	GP11	GP12	GP13	GP14	GP15	GP16 (MAX)	GP17	GP18
	DEPTH:		03.7-08.7'	05-11'	04-09'	02.5-12.5'	06.4-16'	05-15'	08-13'	06.5-16.5'	09-19'
	LAB ID:		L23571-3	L23571-6	L23571-7	L23597-3/L23631-1	L23597-4	L23714-1	L23799-1/L23831-3	L23578-1	L23578-2
	SOURCE:		GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
	SDG:		L23532	L23532	L23532	L23532	L23532	L23636	L23765	L23532	L23532
	MATRIX:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	SAMPLED:		05/24/95	05/24/95	05/24/95	05/26/95-5/30/95	05/26/95	06/05/95	06/09/95-6/12/95	05/25/95	05/25/95
	VALIDATED:		8/09/95	8/09/95	8/09/95	8/09/95	8/09/95	8/07/95	8/09/95	8/09/95	8/09/95
	VOLATILES - METHOD 8010/8020										
67-64-1	Acetone	UG/L						-	9.4		
108-90-7	Chlorobenzene	UG/L						-	-		
108-10-1	4-Methyl-2-pentanone	UG/L						-	-		
75-09-2	Methylene chloride	UG/L						-	-		
108-88-3	Toluene	UG/L						-	0.6		
	VOLATILES - METHOD 8240										
67-64-1	Acetone	UG/L	43	56	46 J	10	6 J			260	5 J
108-10-1	4-Methyl-2-pentanone	UG/L	4 J	4 J	-	-	-			-	-
75-09-2	Methylene chloride	UG/L	-	-	-	11	38			-	-
108-88-3	Toluene	UG/L	8	-	-	-	-			330	-
	VOLATILES - METHOD 8015										
67-63-0	Isopropanol	MG/L	-	-	-	-	-	-	-	-	-
67-56-1	Methanol	MG/L	-	-	-	-	-	-	-	-	-
75-65-1	tert-Butanol	MG/L	-	-	-	-	-	-	-	-	-
	SEMIVOLATILES										
83-32-9	Acenaphthene	UG/L									
132-64-9	Dibenzofuran	UG/L									
101-83-7	Dicyclohexylamine	UG/L				-	-	-	-	-	-
86-73-7	Fluorene	UG/L									
91-57-6	2-Methylnaphthalene	UG/L									
85-01-8	Phenanthrene	UG/L									
117-81-7	bis(2-ethylhexyl)phthalate	UG/L									
	INORGANICS										
12027-67-7	Molybdenum	UG/L	464 J	270 J	1290 J	4.1 J	14 J	8.4 J	5.7 J	12.1 J	-
	OTHERS										
7727-37-9	Ammonia (as N)	MG/L	33	129	113	0.48	0.42	0.42	12.4	1.5	0.35
ES-5002	Chemical Oxygen Demand	MG/L	82.1	394	431	25.7	33.9	28.3	35.2	31.2	-
7757-82-6	Sulfate	MG/L	418	918	1680	286	127	354	33.6	-	70.5
108-95-2	Total Phenolics	MG/L	0.15	0.095	0.28	0.059	0.066	0.059	0.051	0.1	0.059
7664-38-2	Total Phosphorus	MG/L	10.1	7	0.37	0.14	-	0.37	19.2	-	0.17
10-29-7	pH	SU	7.6	7.6	7.5	7.6	7.5	7.4	6.9	7.4	7.3

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.1

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
GEOPROBE GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	SAMPLE ID:	GP19	GP20	GP21	GP22	GP23	GP24	GP26	GP27	GP28
		DEPTH:	08-16'	06-11'	08.3-13.3'	10-15'	10-15'	10-15'	02.7-12.7'	02.5-12.5	3.0-12.5
		LAB ID:	L23631-3	L23842-3/L23872-3 L23885-1/L23905-2	L23672-9	L23726-1	L23726-3	L23726-2	L23631-4	L23636-1/L23677-3	L23636-2
		SOURCE:	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
		SDG:	L23532	L23765	L23636	L23636	L23636	L23636	L23532	L23636	L23636
		MATRIX:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		SAMPLED:	05/30/95	06/13/95-6/16/95	06/01/95	06/06/95	06/06/95	06/06/95	05/30/95	05/31/95-6/02/95	05/31/95
		VALIDATED:	8/09/95	8/09/95	8/07/95	8/07/95	8/07/95	8/07/95	8/09/95	8/07/95	8/07/95
		UNITS:									
	VOLATILES - METHOD 8010/8020										
67-64-1	Acetone	UG/L	14 J	-	-	-	-	-	7.6 J	93	13
108-90-7	Chlorobenzene	UG/L	-	-	-	-	-	-	-	-	-
108-10-1	4-Methyl-2-pentanone	UG/L	-	-	-	-	-	-	-	-	-
75-09-2	Methylene chloride	UG/L	1.8 J	33	-	-	20	-	2.5 J	39	-
108-88-3	Toluene	UG/L	0.4 J	-	1.8	-	1.2	-	2.8 J	4	2.6
	VOLATILES - METHOD 8240										
67-64-1	Acetone	UG/L									
108-10-1	4-Methyl-2-pentanone	UG/L									
75-09-2	Methylene chloride	UG/L									
108-88-3	Toluene	UG/L									
	VOLATILES - METHOD 8015										
67-63-0	Isopropanol	MG/L	-	-	-	-	-	-	-	-	-
67-56-1	Methanol	MG/L	-	-	-	-	-	-	-	-	-
75-65-1	tert-Butanol	MG/L	-	-	-	-	-	-	-	-	-
	SEMIVOLATILES										
83-32-9	Acenaphthene	UG/L									
132-64-9	Dibenzofuran	UG/L									
101-83-7	Dicyclohexylamine	UG/L	-	-	-	-	-	-	-	R	R
86-73-7	Fluorene	UG/L									
91-57-6	2-Methylnaphthalene	UG/L									
85-01-8	Phenanthrene	UG/L									
117-81-7	bis(2-ethylhexyl)phthalate	UG/L									
	INORGANICS										
12027-67-7	Molybdenum	UG/L	-	4.7 J	11.4	-	-	-	11.2 J	71.7	57.2
	OTHERS										
7727-37-9	Ammonia (as N)	MG/L	0.32	0.21	0.26	0.3	0.18	0.25	1.2	1.1	1.3
ES-5002	Chemical Oxygen Demand	MG/L	15.3	17.2	7.3	-	4.5	16.5	44.7	31.1	27.5
7757-82-6	Sulfate	MG/L	110	91.8	97	242	370	114	61.9	158	80.7
108-95-2	Total Phenolics	MG/L	0.059	0.066	0.059	-	0.059	0.073	0.066	0.051	0.073
7664-38-2	Total Phosphorus	MG/L	0.44	14	-	4.2	0.3	-	0.47	11.6	11.5
10-29-7	pH	SU	7.4	7.2	7.1	7.7	7.1	7.1	7.8	7.8	7.4

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.1

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
GEOPROBE GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	UNITS:	GP29	GP30	GP31	GP32	GP33	GP34	GP35	GP36	GP37 (MAX)
	SAMPLE ID:		GP29	GP30	GP31	GP32	GP33	GP34	GP35	GP36	GP37 (MAX)
	DEPTH:		2.9-12.9'	10.3-20.3'	04-14'	03.8-13.8'	05-15'	08.5-18.5	06-21'	05-15'	07-17'
	LAB ID:		L23831-7/L23872-2 L23885-2/L23905-1	L23789-1	L23672-7	L23672-6	L23672-1	L23672-8	L23672-3	L23672-2	L23677-1/L23714-2
	SOURCE:		GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
	SDG:		L23765	L23765	L23636	L23636	L23636	L23636	L23636	L23636	L23636
	MATRIX:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	SAMPLED:		06/12/95-6/16/95	06/08/95	06/01/95	06/01/95	06/01/95	06/01/95	06/01/95	06/01/95	06/02/95-6/05/95
	VALIDATED:		8/09/95	8/09/95	8/07/95	8/07/95	8/07/95	8/07/95	8/07/95	8/07/95	8/07/95
	VOLATILES - METHOD 8010/8020										
67-64-1	Acetone	UG/L	14	7.1	-	11	-	-	37	1200	16 J
108-90-7	Chlorobenzene	UG/L	-	-	-	-	-	-	-	-	-
108-10-1	4-Methyl-2-pentanone	UG/L	-	-	-	-	-	-	12 J	250	-
75-09-2	Methylene chloride	UG/L	-	-	-	-	-	-	-	-	-
108-88-3	Toluene	UG/L	0.6	0.4 J	1.7	0.6	2.6	3	0.9	-	0.8
	VOLATILES - METHOD 8240										
67-64-1	Acetone	UG/L									
108-10-1	4-Methyl-2-pentanone	UG/L									
75-09-2	Methylene chloride	UG/L									
108-88-3	Toluene	UG/L									
	VOLATILES - METHOD 8015										
67-63-0	Isopropanol	MG/L	-	-	-	-	-	-	-	1.1	-
67-56-1	Methanol	MG/L	-	-	-	-	-	-	-	-	-
75-65-1	tert-Butanol	MG/L	-	-	-	-	-	-	-	-	
	SEMIVOLATILES										
83-32-9	Acenaphthene	UG/L									
132-64-9	Dibenzofuran	UG/L									
101-83-7	Dicyclohexylamine	UG/L	-	-	-	-	-	-	-	-	-
86-73-7	Fluorene	UG/L									
91-57-6	2-Methylnaphthalene	UG/L									
85-01-8	Phenanthrene	UG/L									
117-81-7	bis(2-ethylhexyl)phthalate	UG/L									
	INORGANICS										
12027-67-7	Molybdenum	UG/L	25.1	50	17.1	14	16.7	25.6	19.4	87.2	36.1 J
	OTHERS										
7727-37-9	Ammonia (as N)	MG/L	6.5	0.77	2.8	3.4	0.24	1	16.9	20.9	0.62
ES-5002	Chemical Oxygen Demand	MG/L	111	410	35.6	35.9	9.55	10.8	106	915	36.9
7757-82-6	Sulfate	MG/L	133	501	115	157	54.5	48.6	36.2	73.4	493
108-95-2	Total Phenolics	MG/L	0.059	0.059	0.081	0.073	0.066	0.066	0.59	3.7	0.059
7664-38-2	Total Phosphorus	MG/L	13.2	-	0.055	0.056	9.9	0.017	8.6	11.9	22.4 J
10-29-7	pH	SU	7.6	7.8	7.3	8	7.5	7.5	7.4	7.3	7.5

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.1

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
GEOPROBE GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	UNITS:	GP38	GP39	GP40	GP41	GP42	GP43	GP44	GP45	GP46
	SAMPLE ID:		GP38	GP39	GP40	GP41	GP42	GP43	GP44	GP45	GP46
	DEPTH:		02-12'	01-11'	04.5-14.5'	12.5-22.5'	05-15'	05.8-15.8'	05-15'	06.5-16.5'	05-15'
	LAB ID:		L23714-4	L23714-5	L23714-6	L23769-5/L23799-2 L23831-2	L23766-1	L23765-1	L23765-2	L23765-3	L23766-2
	SOURCE:		GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
	SDG:		L23636	L23636	L23636	L23765	L23765	L23765	L23765	L23765	L23765
	MATRIX:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	SAMPLED:		06/05/95	06/05/95	06/05/95	06/06/95-6/12/95	06/07/95	06/07/95	06/07/95	06/07/95	06/07/95
	VALIDATED:		8/07/95	8/07/95	8/07/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95
	VOLATILES - METHOD 8010/8020										
67-64-1	Acetone	UG/L	38	-	67	42		7.9	-	-	
108-90-7	Chlorobenzene	UG/L	-	-	-	-		-	-	0.3 J	
108-10-1	4-Methyl-2-pentanone	UG/L	-	-	260 J	8.5		-	-	-	
75-09-2	Methylene chloride	UG/L	-	-	-	-		-	-	-	
108-88-3	Toluene	UG/L	1.6	1.2	1.7	1.9		1.8	1.6	0.5	
	VOLATILES - METHOD 8240										
67-64-1	Acetone	UG/L									
108-10-1	4-Methyl-2-pentanone	UG/L									
75-09-2	Methylene chloride	UG/L									
108-88-3	Toluene	UG/L					-				0.9 J
	VOLATILES - METHOD 8015										
67-63-0	Isopropanol	MG/L	-	-	-	-		-	-	-	
67-56-1	Methanol	MG/L	-	-	-	-		-	-	-	
75-65-1	tert-Butanol	MG/L	-	-	-	-		-	-	-	
	SEMIVOLATILES										
83-32-9	Acenaphthene	UG/L					5 J				-
132-64-9	Dibenzofuran	UG/L					5 J				-
101-83-7	Dicyclohexylamine	UG/L	-	61	27	-		730	1100	710	
86-73-7	Fluorene	UG/L					8 J				-
91-57-6	2-Methylnaphthalene	UG/L					4 J				-
85-01-8	Phenanthrene	UG/L					11				-
117-81-7	bis(2-ethylhexyl)phthalate	UG/L					22				-
	INORGANICS										
12027-67-7	Molybdenum	UG/L	51.3	34.4	12.9	17.9		244	82.3	26.6	
	OTHERS										
7727-37-9	Ammonia (as N)	MG/L	0.25	1.2	0.76	0.41		1.1	1.1	0.69	
ES-5002	Chemical Oxygen Demand	MG/L	22.4	28.1	23.4	83.1		21.8	11.9	20.2	
7757-82-6	Sulfate	MG/L	253		133	185		288	313	175	
108-95-2	Total Phenolics	MG/L	0.059	0.066	0.059	-		-	-	-	
7664-38-2	Total Phosphorus	MG/L	-	0.18	-	16.8		0.074	7.4	0.15	
10-29-7	pH	SU	7.6	7.3	7	7.3		7	6.9	7	

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.1

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
GEOPROBE GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	SAMPLE ID:	GP47	GP48	GP49	GP50	GP51	GP52	REGP52	GP53	GP54
		DEPTH:	03.5-13.5'	03.9-13.9'	03.4-13.4'	10.9-20.9'	06-16'	05-15'	05-15'	05-15'	04-14'
		LAB ID:	L23766-3	L23766-4	L23831-1/L23872-4 L24976-1	L23769-3	L23769-4	L23842-2/L23872-1	L23905-3	L23842-1	L23769-2
		SOURCE:	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
		SDG:	L23765	L23765	L23765/L24880	L23765	L23765	L23765	L23765	L23765	L23765
		MATRIX:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		SAMPLED:	06/07/95	06/07/95	06/12/95-6/07/95	06/08/95	06/08/95	06/13/95-6/14/95	06/16/95	06/13/95	06/08/95
		VALIDATED:	8/09/95	8/09/95	8/09/95-8/21/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95	8/09/95
		UNITS:									
	VOLATILES - METHOD 8010/8020										
67-64-1	Acetone	UG/L			-	1500	-	-	-	53	-
108-90-7	Chlorobenzene	UG/L			-	-	-	-	-	-	-
108-10-1	4-Methyl-2-pentanone	UG/L			-	140	19000 J	-	-	45	-
75-09-2	Methylene chloride	UG/L			-	-	7700 J	18000000	19000000	100	-
108-88-3	Toluene	UG/L			-	1	-	-	-	0.5	0.7
	VOLATILES - METHOD 8240										
67-64-1	Acetone	UG/L									
108-10-1	4-Methyl-2-pentanone	UG/L									
75-09-2	Methylene chloride	UG/L									
108-88-3	Toluene	UG/L	-	-							
	VOLATILES - METHOD 8015										
67-63-0	Isopropanol	MG/L			-	-	-	-	-	-	-
67-56-1	Methanol	MG/L			-	-	-	-	-	-	-
75-65-1	tert-Butanol	MG/L			-	2.5	-	-	-	-	-
	SEMIVOLATILES										
83-32-9	Acenaphthene	UG/L	-	-							
132-64-9	Dibenzofuran	UG/L	-	-							
101-83-7	Dicyclohexylamine	UG/L				540	1500	80 J		-	510
86-73-7	Fluorene	UG/L	-	-							
91-57-6	2-Methylnaphthalene	UG/L	-	-							
85-01-8	Phenanthrene	UG/L	-	-							
117-81-7	bis(2-ethylhexyl)phthalate	UG/L	-	-							
	INORGANICS										
12027-67-7	Molybdenum	UG/L				38.9	89.7	105		36.2	12.4
	OTHERS										
7727-37-9	Ammonia (as N)	MG/L				2.5	12.4	2.9		0.86	3
ES-5002	Chemical Oxygen Demand	MG/L			75.1	143	195	4650		30.5	13.7
7757-82-6	Sulfate	MG/L			411	278	987	7850		267	33.3
108-95-2	Total Phenolics	MG/L			0.051	0.059	0.051	2.4		0.066	0.066
7664-38-2	Total Phosphorus	MG/L				0.3	-	0.055		18.8	11
10-29-7	pH	SU			7.2	7.4	8.4	7.5		7.9	7.7

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.1

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
GEOPROBE GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	UNITS:	GP55	GP56	GP57	GP58	GP59 (MAX)	GP60	GP61
	SAMPLE ID:		GP55	GP56	GP57	GP58	GP59 (MAX)	GP60	GP61
	DEPTH:		08-23'	08-23'	04-19'	04-19'	04-19'	04-19'	05-25'
	LAB ID:		L24911-2	L24911-1	L24978-7	L24978-2	L24978-5	L24978-8	L25011-1
	SOURCE:		GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
	SDG:		L24880	L24880	L24880	L24880	L24880	L24880	L24880
	MATRIX:		WATER	WATER	WATER	WATER	WATER	WATER	WATER
	SAMPLED:		08/04/95	08/04/95	08/07/95	08/07/95	08/07/95	08/07/95	08/08/95
	VALIDATED:		8/21/95	8/21/95	8/21/95	8/21/95	8/21/95	8/21/95	8/21/95
	VOLATILES - METHOD 8010/8020								
67-64-1	Acetone	UG/L	710 J	52 J	12	25	68	25	-
108-90-7	Chlorobenzene	UG/L	-	-	-	-	-	-	-
108-10-1	4-Methyl-2-pentanone	UG/L	3900 J	-	-	-	-	-	-
75-09-2	Methylene chloride	UG/L	-	-	-	-	-	-	-
108-88-3	Toluene	UG/L	5.7 J	-	0.5	1	0.8	0.9	0.7
	VOLATILES - METHOD 8240								
67-64-1	Acetone	UG/L							
108-10-1	4-Methyl-2-pentanone	UG/L							
75-09-2	Methylene chloride	UG/L							
108-88-3	Toluene	UG/L							
	VOLATILES - METHOD 8015								
67-63-0	Isopropanol	MG/L	-	-	-	-	-	-	-
67-56-1	Methanol	MG/L	-	-	-	-	-	-	-
75-65-1	tert-Butanol	MG/L	-	-	-	-	-	-	-
	SEMIVOLATILES								
83-32-9	Acenaphthene	UG/L							
132-64-9	Dibenzofuran	UG/L							
101-83-7	Dicyclohexylamine	UG/L	-	-	1600	-	-	-	-
86-73-7	Fluorene	UG/L							
91-57-6	2-Methylnaphthalene	UG/L							
85-01-8	Phenanthrene	UG/L							
117-81-7	bis(2-ethylhexyl)phthalate	UG/L							
	INORGANICS								
12027-67-7	Molybdenum	UG/L	27.3 J	16.6 J	6.3 J	180	8 J	20.7	6.8 J
	OTHERS								
7727-37-9	Ammonia (as N)	MG/L	1.4	0.9	6.5	4.1	1.1	7.2	0.85
ES-5002	Chemical Oxygen Demand	MG/L	51.9	25.8	40.8	51	28.6	41.9	-
7757-82-6	Sulfate	MG/L	78	420	415	338	466	97.4	890
108-95-2	Total Phenolics	MG/L	-	-	-	-	-	-	-
7664-38-2	Total Phosphorus	MG/L	17.2	25.3	0.08	0.26	0.17	0.23	15.6
10-29-7	pH	SU	7.5	7.5	7.2	7	7.4	7.8	7.1

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

APPENDIX B3

Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York.* For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.

TABLE 2.7
SUMMARY OF SOIL GAS RESULTS
UPPER MAIN TANK FARM

Sample Location	Depth	Peak Reading	Stabilized Reading
SG-1	3.6	4.5	0.6 - 1.0
SG-2	3.0	1.4	.2
SG-3	3.0	2.2	1.4
SG-4	3.0	1.8	1.4
SG-5	3.0	11.8	2.2
SG-6	3.0	21.6	2.6
SG-7	3.0	13.3	5.3
SG-8	3.0	1.4	1.0
SG-9	3.0	11.8	4.1
SG-10	3.0	4.9	3.0
SG-11	3.0	8.4	1.4
SG-12	3.0	0.0	0.0
SG-13	2.0	0.0	0.0
SG-14	2.0	11.8	0.0
SG-15	2.0	7.3	5.7
SG-16	2.0	4.8	2.2
SG-17	1.4	9.6	2.4
SG-18	2.0	5.3	3.0
SG-19	2.0	1249.0	NA
SG-20	1.5	24.6	18.0
SG-21	1.0	21.5	2.2
SG-22	2.0	3.0	3.6
SG-23	1.5	16.0	---
SG-24	2.0	14.6	5.0
SG-25	1.8	---	0.8
SG-26	2.0	14.6	2.9
SG-27	2.0	5.0	0.0
SG-28	2.0	4.0	0.0
SG-29	2.0	14.6 - 10	0.0
SG-30	2.0	10.4	8.7 - 8.0
SG-31	1.8	5.0	0.0
SG-32	2.0	0.0	0.0
SG-33	1.7	0.0	0.0
SG-34	2.0	0.0	0.0
SG-35	2.0	0.0	0.0
SG-36	2.0	0.0	0.0
SG-37	2.0	0.0	0.0
SG-38	2.0	0.0	0.0
SG-39	2.0	0.0	0.0
SG-40	2.0	0.0	0.0
SG-41	2.0	0.0	0.0
SG-42	3.0	0.0	0.0
SG-43	2.0	16.0	0.0
SG-44	2.0	0.0	0.0
SG-45	2.0	11.0	0.0
SG-46	2.0	5.7	4.7
SG-47	2.0	4.5	2.9
SG-48	2.0	4.9	0.9
SG-49	2.0	4.9	0.0
SG-50	2.0	1.7	1.3
SG-51	2.0	0.0	0.0
SG-52	3.0	3.3	2.5
SG-53	3.0	2.1	1.3 - 1.7

NOTES:
SG-19 - Reading peaked at 1249 prior to drawing in water
SG-22 - Residue on Soil Gas Probe
SG-23 - No stabilized reading due to water in flask
SG-25 - No peak reading recorded due to water in flask

APPENDIX B4

Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York*. For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.

TABLE 2.8
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
LOWER MAIN TANK FARM
ROUND 1, ROUND 1 RESAMPLING, ROUND 2, ROUND 3, AND ROUND 4

			tert–BUTANOL (mg/l)				
MONITORING WELL	LABORATORY	USEPA METHOD	ROUND 1 (12/8/89)	ROUND 1 RESAMPLING (1/19/90)	ROUND 2 (4/26/90)	ROUND3 (8/2/90)	ROUND4 (11/7/90)
6 NYCRR Part 703 Class GA Ground Water Standard			0.050	0.050	0.050	0.050	0.050
LMTF–1M	GENERAL	8240 (GCMS)	0.063	0.2 U			
	GALSON	8240 (GCMS)	0.030	0.082 J	0.1 U	0.053 J	0.1 U
	RECRA	8240 (GCMS)	NA	0.1 J	0.1 U	0.1 U	0.1 U
LMTF–1T	GENERAL	8240 (GCMS)	0.704	0.208			
	GALSON	8240 (GCMS)	0.110	0.190	0.170	0.130	0.210
	RECRA	8240 (GCMS)	NA	0.170	0.230	0.250	0.170
LMTF–2M	GENERAL	8240 (GCMS)	0.022	0.2 U			
	GALSON	8240 (GCMS)	0.020	0.1 U	0.1 U	0.1 U	0.1 U
	RECRA	8240 (GCMS)	NA	0.1 U	0.1 U	0.1 U	0.1 U
LMTF–2T	GENERAL	8240 (GCMS)	0.302	0.566			
	GALSON	8240 (GCMS)	0.230	0.600	0.370	0.360	0.500
	RECRA	8240 (GCMS)	NA	0.410	0.460	0.560	0.330
LMTF–3M	GENERAL	8240 (GCMS)	0.05 U	0.2 U			
	GALSON	8240 (GCMS)	0.05 U	0.045 J	0.1 U	0.1 U	0.1 U
	RECRA	8240 (GCMS)	NA	0.1 U	0.1 U	0.1 U	0.1 U
LMTF–3T	GENERAL	8240 (GCMS)	0.376	0.390			
	GALSON	8240 (GCMS)	0.140	0.320	0.220 JD	0.210	0.310
	RECRA	8240 (GCMS)	NA	0.240	0.350	0.300	0.210

NOTE:
J = Estimated value. Value is below the compound quatitation limit.
D = Diluted value.
U = Compound not detected above the compound quantitation limits.

APPENDIX B5a

Source: ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York*. For Bristol-Myers Squibb Company Bio/Chem Division. November 1994.

TABLE 2.1
CHT TANK FARM AREA
SLUG TEST RESULTS

MONITORING WELL	INJECTION/ WITHDRAWAL	HYDRAULIC CONDUCTIVITY (feet/day)	UNIT SCREENED
CH–1T	INJECTION	0.031	Glacial Till
CH–1T	WITHDRAWAL	0.082	
CH–3TS	INJECTION	NA	Glacial Till
CH–3TS	WITHDRAWAL	NA	
CH–4TS	INJECTION	NA	Glacial Till
CH–4TS	WITHDRAWAL	NA	
CH–5TD	INJECTION	0.353	Glacial Till
CH–5TD	WITHDRAWAL	0.24	

Notes:

Slug tests performed by Dames & Moore in August 1990
Slug tests analyzed by Bouwer and Rice method for unconfined aquifers
NA = Not analyzed due to negligible change in head

TABLE 2.4
SUMMARY OF SOIL ANALYTICAL RESULTS
CHT TANK FARM

BORING NO.	SAMPLE NO.	DEPTH (feet)	USEPA METHOD	METHANOL (mg/kg)	METHYLENE CHLORIDE (mg/kg)	MIBK (mg/kg)
CHTF–2T	10	18.0–18.7	8015 (DAI)	ND		
			9240 (GCMS)		1.1	0.010
CHTF–2T	11	20.0–20.7	8015 (DAI)	ND		
			9240 (GCMS)		3.9	ND
CHTF–2T	12	22.0–22.8	8015 (DAI)	ND		
			9240 (GCMS)		108.0	0.042

NOTE:

ND = Not Dectected

TABLE 2.5
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHT TANK FARM WELLS
ROUNDS 1 AND 2

			ROUND 1 FEB.2,1990			ROUND 2 AUG. 2, 1990		
MONITORING WELL	LABORATORY	USEPA METHOD	METHANOL (mg/l)	METHYLENE CHLORIDE (mg/l)	MIBK (mg/l)	METHANOL (mg/l)	METHYLENE CHLORIDE (mg/l)	MIBK (mg/l)
6 NYCRR Part 703 Class GA Ground Water Standards			0.05	0.005	0.05	0.05	0.005	0.05
CH-1M	GALSON	8015 (DAI)	ND			ND		
	GALSON	8240 (GCMS)		ND	ND		ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-1T	GALSON	8015 (DAI)	ND			ND		
	GALSON	8240 (GCMS)		ND	ND		ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-2M	GALSON	8015 (DAI)	ND			ND		
	GALSON	8240 (GCMS)		ND	ND		ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-2T	GALSON	8015 (DAI)	ND			ND		
	GALSON	8240 (GCMS)		13200	ND		13400	ND
	RECRA	8015 (DAI)	1.5			2.8		
	RECRA	8240 (GCMS)		11000	ND		9400	ND
CH-2TD	GALSON	8015 (DAI)				ND		
	GALSON	8240 (GCMS)					16.0	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					16.0	ND
CH-3F	GALSON	8015 (DAI)				ND		
	GALSON	8240 (GCMS)					ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-3TS	GALSON	8015 (DAI)				ND		
	GALSON	8240 (GCMS)					ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-4TS	GALSON	8015 (DAI)				ND		
	GALSON	8240 (GCMS)					ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-4TD	GALSON	8015 (DAI)				ND		
	GALSON	8240 (GCMS)					ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-5TS	GALSON	8015 (DAI)				ND		
	GALSON	8240 (GCMS)					ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND
CH-5TD	GALSON	8015 (DAI)				ND		
	GALSON	8240 (GCMS)					ND	ND
	RECRA	8015 (DAI)				ND		
	RECRA	8240 (GCMS)					ND	ND

NOTE:
ND = Not Detected

TABLE 2.6
GROUNDWATER ANALYTICAL SUMMARY
METHYLENE CHLORIDE CONCENTRATIONS
CHT TANK FARM WELLS

WELL NUMBER	Units	Date Sampled								
		02/02/90	08/02/90	07/22/91	02/18/91	03/18/92	04/30/92	06/02/92	11/13/92	11/04/93
NYSDEC Class GA Groundwater Standard		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Extraction Wells										
CH–2T	mg/l	13,200	13,400		650	1,600	10	54	Dry	1,900
CH–2TD	mg/l		16				2	0.0078	47	5
CH–10T	mg/l					2,470	230	180	440	1,300
Air Inlet Wells										
CH–6T	mg/l			1		1	--	--	--	--
CH–7T	mg/l			0.18		--	0.0013	--	--	--
CH–7F	mg/l								0.054	--
CH–8T	mg/l			243		330	48	0.02	500	53
CH–9T	mg/l			0.17		--	0.0017	--	--	--
CH–11T	mg/l					44	20	12	--	0.036
Monitoring Wells										
CH–1M	mg/l	--	--						--	--
CH–1T	mg/l	--	--						--	--
CH–2M	mg/l	--	--						0.007	0.001
CH–3F	mg/l		--						--	--
CH–3TS	mg/l		--						--	--
CH–4TS	mg/l		--						--	--
CH–4TD	mg/l		--						0.009	--
CH–5TS	mg/l		--						0.006	--
CH–5TD	mg/l		--						--	--

Notes:

-- Not Detected

APPENDIX B5b

Source: Parsons Engineering Science, Inc. 1997. *Closure Report For The Vacuum Extraction System Thompson Road Facility*. For Bristol-Myers Squibb Company. June 1997.

TA[illegible] 3.1

VES GROUNDWATER ANALYTICAL SUMMARY [1]
METHYLENE CHLORIDE CONCENTRATIONS

WELL NUMBER	Units	Date Sampled											
		2/2/90	8/2/90	7/22/91	2/18/92	3/18/92	4/30/92	6/2/92	11/13/92	11/4/93	1/17/95	8/23/95	4/16-24/96
NYSDEC Class GA Groundwater Standard		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Extraction Wells													
CH-2T	mg/l	13,200	13,400		650	1,600	10	54	Dry	1,900	410	160	95
CH-2TD	mg/l		16				2	0.0078	47	5		3.3	21
CH-10T	mg/l					2,470	230	180	440	1,300	4.7	12	610
Air Inlet Wells													
CH-6T	mg/l			1		1	ND	ND	ND	ND			ND
CH-7T	mg/l			0.18		ND	0.0013	ND	ND	ND			ND
CH-7F	mg/l								0.054	ND			
CH-8T	mg/l			243		330	48	0.02	500	53			0.032
CH-9T	mg/l			0.17		ND	0.0017	ND	ND	ND			ND
CH-11T	mg/l					44	20	12	ND	0.036			2
Monitoring Wells													
CH-1M	mg/l	ND	ND						ND	ND			
CH-1T	mg/l	ND	ND						ND	ND			
CH-2M	mg/l	ND	ND						0.007	0.001			ND
CH-3F	mg/l		ND						ND	ND			
CH-3TS	mg/l		ND						ND	ND			
CH-4TS	mg/l		ND						ND	ND			
CH-4TD	mg/l		ND						0.009	ND			
CH-5TS	mg/l		ND						0.006	ND			
CH-5TD	mg/l		ND						ND	ND			

Notes:
(1) Data provided by Bristol-Myers Squibb
ND = Not Detected
Blank = Not Analyzed

APPENDIX B6a

Source: Parsons Engineering Science, Inc. 1995. *Site Investigation and Remediation Study Report.* For Bristol-Myers Squibb Company. October 1995.

TABLE 4.2

BRISTOL-MYERS SQUIBB COMPANY THOMPSON ROAD FACILITY SIRS MONITORING WELL SOIL BORING DATA DETECTED COMPOUND SUMMARY		SAMPLE ID:	MW4-1A	MW4-1B	MW4-1C	MW4-2A	MW4-2B	MW4-2C	MW4-3A	MW4-3C (MAX)
		DEPTH:	08-10'	04-06.25'	20-22'	04-06'	06-08'	20-22'	02-04'	20-21 2'
		LAB ID:	L24836-1	L24836-2	L24836-3	L24836-4	L24836-5	L24852-4	L24852-1	L24852-3
		SOURCE:	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON	GALSON
		SDG:	L24836	L24836	L24836	L24836	L24836	L24852	L24852	L24852
		MATRIX:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		SAMPLED:	08/01/95	08/01/95	08/01/95	08/01/95	08/01/95	08/02/95	08/02/95	08/02/95
		VALIDATED:	8/21/95	8/21/95	8/21/95	8/21/95	8/21/95	8/21/95	8/21/95	8/21/95
CAS NO.	COMPOUND	UNITS:								
	VOLATILES - METHOD 8010/20									
67-64-1	Acetone	UG/KG	110	160	110	93	220	200	110	220 J
108-10-1	4-Methyl-2-pentanone	UG/KG	21	24 J	12	54	13	9.7 J	14	13 J
75-09-2	Methylene chloride	UG/KG	-	-	-	-	-	-	-	-
	SEMIVOLATILES									
101-83-7	Dicyclohexylamine	UG/KG	-	-	-	1500 J	-	-	-	-

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.3

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY SIRS
MONITORING WELL GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

CAS NO.	COMPOUND	SAMPLE ID:	PW-2T	PW-5T	MW4-1	MW4-2	MW4-3
		DEPTH:			11-21'	11-21'	11-21'
		LAB ID:	L23843-2	L23843-1	L24880-1	L24911-3	L24911-4
		SOURCE:	GALSON	GALSON	GALSON	GALSON	GALSON
		SDG:	L23843	L23843	L24880	L24880	L24880
		MATRIX:	WATER	WATER	WATER	WATER	WATER
		SAMPLED:	6/13/95	6/13/95	8/03/95	8/04/95	8/04/95
		VALIDATED:	8/07/95	8/07/95	8/21/95	8/21/95	8/21/95
		UNITS:					
	VOLATILES - METHOD 8010/20						
67-64-1	Acetone	UG/L			140	140 J	100 J
108-10-1	4-Methyl-2-pentanone	UG/L			160	86 J	95 J
	SEMIVOLATILES						
95-50-1	1,2-Dichlorobenzene	UG/L	120	-			
101-83-7	Dicyclohexylamine	UG/L			7	-	-
117-81-7	bis(2-ethylhexyl)phthalate	UG/L	5 J	-			
	INORGANICS						
7429-90-5	Aluminum	UG/L		304			
7440-38-2	Arsenic	UG/L		5.8 J			
7440-39-3	Barium	UG/L		26.9 J			
7440-70-2	Calcium	UG/L		395000			
7439-89-6	Iron	UG/L		1610 J			
7439-95-4	Magnesium	UG/L		93200			
7439-96-5	Manganese	UG/L		82			
7440-09-7	Potassium	UG/L		4270 J			
7440-23-5	Sodium	UG/L		443000			
7440-66-6	Zinc	UG/L		3.5 J			

- Not detected.
J = Estimated value.
(MAX) - Indicates a duplicate sample was taken and the higher concentration was reported.

TABLE 4.5
PERIMETER WELL GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

PARAMETER	NYSDEC WQS (1)	PW-2T								PW-3T								PW-3MD							
		10/89	8/92	8/93	10/93	5/94	8/94	11/94	5/95	10/89	8/92	8/93	10/93	5/94	8/94	11/94	5/95	10/89	8/92	8/93	10/93	5/94	8/94	11/94	5/95
VOLATILE ORGANICS (ug/l)																									
Chloroform	7	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
1,2-Dichlorobenzene	4.7	***	28	19	--	--	--	19	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
1,1-Dichloroethane	5	***	1	1	--	--	--	--	**	***	--	--	--	--	--	--	**	***	2	2	1	--	1	1	**
1,2-Dichloroethane	5	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
Tetrachloroethylene	5	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
1,1,1-Trichloroethane	5	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
ALCOHOLS (ug/l)																									
Methanol	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WET CHEMISTRY (mg/l)																									
Chemical Oxygen Demand	NS	***	110	18	54	120	36	40	12	***	360	11	64	*	19	15	20	***	27	13	18	22	--	25	--
Total Phenols	0.001	***	--	--	--	--	--	--	0.003	***	--	--	--	--	--	--	NA	***	--	--	--	--	--	--	--
Sulfate	250	***	820	800	400	1000	380	1100	410	***	1800	1800	1800	*	1400	1800	2200	***	110	120	130	150	150	140	--
Ammonia, Nitrogen	2	***	--	0.37	0.22	--	--	--	0.17	***	0.14	0.24	0.41	*	--	--	0.47	***	--	0.34	0.59	2.2	--	0.06	0.4
Total Phosphorus	NS	***	0.86	--	0.06	0.86	0.24	0.24	--	***	3.4	--	0.43	*	0.18	0.1	0.31	***	0.19	--	0.08	0.08	0.05	0.11	--

-- Not Detected
* Monitoring well dry during sampling
** Dropped from parameter list due to previous non-detections
*** Parameters not analyzed
NS No Standard
(1) Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 10/22/93
PW-2M and PW-4F were dry during all sampling rounds

TABLE 4.5 cont
PERIMETER WELL GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

PARAMETER	NYSDEC WQS (1)	PW-6L						PW-6F					
		8/93	10/93	5/94	8/94	11/94	5/95	8/93	10/93	5/94	8/94	11/94	5/95
VOLATILE ORGANICS (ug/l)													
Chloroform	7	3	--	--	--	--	**	--	--	--	*	*	*
1,2-Dichlorobenzene	4.7	--	--	--	--	--	**	--	--	--	*	*	*
1,1-Dichloroethane	5	2	--	--	--	--	**	--	--	--	*	*	*
1,2-Dichloroethane	5	6	--	--	--	--	**	--	--	--	*	*	*
Tetrachloroethylene	5	2	--	--	--	--	**	--	--	--	*	*	*
1,1,1-Trichloroethane	5	11	--	--	--	--	**	--	--	--	*	*	*
ALCOHOLS (ug/l)													
Methanol	NS	--	--	--	--	--	--	--	--	--	*	*	*
WET CHEMISTRY (mg/l)													
Chemical Oxygen Demand	NS	78	120	220	21	29	110	110	*	*	*	*	*
Total Phenols	0.001	--	--	--	--	--	0.003	--	*	*	*	*	*
Sulfate	250	470	800	790	850	850	930	62	*	*	*	*	*
Ammonia, Nitrogen	2	2.1	1.1	0.32	0.29	0.19	1	24	*	*	*	*	*
Total Phosphorus	NS	1.4	1.9	2.3	0.36	0.18	0.14	2.5	*	*	*	*	*

-- Not Detected
* Monitoring well dry during sampling
** Dropped from parameter list due to previous non-detections
*** Parameters not analyzed
NS No Standard
(1) Ambient Water Quality Standards and Guidance Values, T.O G.S. 1.1.1, 10/22/93
PW-2M and PW-4F were dry during all sampling rounds

TABLE 4.5 cont
PERIMETER WELL GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

PARAMETER	NYSDEC	PW-4LD								PW-5T						PW-6T					
	WQS (1)	10/89	8/92	8/93	10/93	5/94	8/94	11/94	5/95	8/93	10/93	5/94	8/94	11/94	5/95	8/93	10/93	5/94	8/94	11/94	5/95
VOLATILE ORGANICS (ug/l)																					
Chloroform	7	***	--	--	--	--	--	--	**	--	--	--	--	--	**	--	--	--	--	--	**
1,2-Dichlorobenzene	4.7	***	--	--	--	--	--	--	**	--	--	--	--	--	**	--	--	--	--	--	**
1,1-Dichloroethane	5	***	--	--	--	--	--	--	**	--	--	--	--	--	**	--	--	--	--	--	**
1,2-Dichloroethane	5	***	--	--	--	--	--	--	**	--	--	--	--	--	**	--	--	--	--	--	**
Tetrachloroethylene	5	***	--	--	--	--	--	--	**	--	--	--	--	--	**	--	--	--	--	--	**
1,1,1-Trichloroethane	5	***	--	--	--	--	--	--	**	--	--	--	--	--	**	--	--	--	--	--	**
ALCOHOLS (ug/l)																					
Methanol	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WET CHEMISTRY (mg/l)																					
Chemical Oxygen Demand	NS	***	32	--	130	14	--	17	17	510	540	440	23	330	15	47	150	380	43	130	59
Total Phenols	0.001	***	--	--	--	--	--	--	--	0.005	--	--	--	--	0.006	--	--	--	--	--	--
Sulfate	250	***	200	210	0	220	220	200	160	1500	1200	740	840	930	520	1800	1900	1900	1900	1900	2000
Ammonia, Nitrogen	2	***	0.05	0.3	--	--	--	--	0.09	1.1	0.84	3	0.58	0.2	0.17	2.8	1.6	0.85	0.43	0.3	1.5
Total Phosphorus	NS	***	0.36	--	1.9	0.09	0.33	0.14	0.18	--	11	2.5	1.5	3.2	0.18	29	4	2.5	0.34	1.5	0.16

-- Not Detected
* Monitoring well dry during sampling
** Dropped from parameter list due to previous non-detections
*** Parameters not analyzed
NS No Standard
(1) Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 10/22/93
PW-2M and PW-4F were dry during all sampling rounds

TABLE 4.5 cont
PERIMETER WELL GROUNDWATER DATA
DETECTED COMPOUND SUMMARY

PARAMETER	NYSDEC WQS (1)	PW-3MS								PW-4T								PW-4LS							
		10/89	8/92	8/93	10/93	5/94	8/94	11/94	5/95	10/89	8/92	8/93	10/93	5/94	8/94	11/94	5/95	10/89	8/92	8/93	10/93	5/94	8/94	11/94	5/95
VOLATILE ORGANICS (ug/l)																									
Chloroform	7	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
1,2-Dichlorobenzene	4.7	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
1,1-Dichloroethane	5	***	2	2	--	--	1	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
1,2-Dichloroethane	5	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
Tetrachloroethylene	5	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
1,1,1-Trichloroethane	5	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**	***	--	--	--	--	--	--	**
ALCOHOLS (ug/l)																									
Methanol	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	990	--	--	--	--
WET CHEMISTRY (mg/l)																									
Chemical Oxygen Demand	NS	***	46	18	25	24	12	25	--	***	30	13	130	46	17	29	15	***	62	29	82	90	15	23	15
Total Phenols	0.001	***	--	0.01	--	--	--	--	0.002	***	--	--	--	--	--	--	0.003	***	--	--	--	--	--	--	--
Sulfate	250	***	130	130	160	170	190	180	380	***	590	610	620	570	560	580	610	***	62	51	47	35	40	98	84
Ammonia, Nitrogen	2	***	0.15	0.63	0.41	0.24	--	0.08	0.79	***	--	0.26	0.2	0.13	0.31	--	0.25	***	0.81	1	1.6	0.23	0.11	0.12	1.1
Total Phosphorus	NS	***	0.95	--	0.21	0.47	0.29	0.25	--	***	0.32	--	1.5	0.31	0.22	0.29	0.15	***	0.84	--	1.1	0.13	0.25	0.11	0.21

-- Not Detected
* Monitoring well dry during sampling
** Dropped from parameter list due to previous non-detections
*** Parameters not analyzed
NS No Standard
(1) Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 10/22/93
PW-2M and PW-4F were dry during all sampling rounds

APPENDIX B6b

ES-Engineering Science. 1994. *Site Contamination Study Report Thompson Road Facility Syracuse, New York*. For Bristol-Myers Squibb Company Bio/Chem Division. June 1994.

TABLE 2.10
NOTCH WELLS
GROUNDWATER ANALYTICAL SUMMARY

PARAMETER	NYSDEC WQS (1)	MW35-1		MW35-2		MW35-3		MW77-1		MW77-2		MW77-3	
		Aug-93	Oct-93	Aug-93	Oct-93	Aug-93	Oct-93	Aug-93	Oct-93	Aug-93	Oct-93	Aug-93	Oct-93
VOLATILE ORGANICS (ug/l)													
Chlorobenzene	5	9	10	*	*	*	*	--	--	*	--	--	--
Acetone	50 (G)	--	--	*	*	*	*	--	--	*	190	--	--
Methyl Isobutyl Ketone	NS	--	--	*	*	*	*	--	16	*	--	--	--
ALCOHOLS (ug/l)													
Methanol	NS	--	--	*	*	*	*	--	--	*	--	--	--
WET CHEMISTRY (mg/l)													
Chemical Oxygen Demand	NS	190	*	*	*	*	*	250	140	*	*	260	91
Total Phenols	0.001	--	*	*	*	*	*	--	--	*	*	--	--
Sulfate	250	200	*	*	*	*	*	38	420	*	*	22	29
Ammonia, Nitrogen	2	2.7	*	*	*	*	*	0.62	1.1	*	*	0.71	0.39
Total Phosphorus	NS	--	*	*	*	*	*	--	0.84	*	*	--	0.66

-- Not Detected

* Monitoring well dry during sampling

NA Not Analyzed

NS No Standard

(1) Ambient Water Quality Standards and Guidance Values, T.O.G.S. 1.1.1, 10/22/93

(G) Guidance value

[ ] = Exceeds groundwater quality standard

APPENDIX B6c

Source: O'Brien and Gere Engineers, Inc. 1994. *Storm Sewer Contaminant Source Investigation.* For Bristol-Myers Squibb Company Thompson Road Facility. January 1994.

TABLE 4

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER SOURCE CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
VOLATILE ORGANIC COMPOUNDS
AUGUST 1992

DESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD
Benzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Benzyl Chloride	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bis (2-chloroethoxy) methane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bromobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bromodichloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bromoform	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Bromomethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Carbon Tetrachloride	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2-Chloroethylvinyl Ether	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroform	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1-Chlorohexane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloromethylmethyl Ether	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2-Chlorotoluene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
4-Chlorotoluene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromochloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromomethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2-Dichlorobenzene	28	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,3-Dichlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,4-Dichlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dichlorodifluoromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethane	1	N.D.	2	2	N.D.	N.D.	N.D.
1,2-Dichloroethene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1-Dichloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloroethylene (total)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dichloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2-Dichloropropane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
cis-1,3-Dichloropropylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
trans-1,3-Dichloropropylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethylbenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1,2,2-Tetrachloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1,1,2-Tetrachloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tetrachloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1,1-Trichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,1,2-Trichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Trichloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Trichlorofluoromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1,2,3-Trichloropropane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Vinyl Chloride	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Xylene (total)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Acetone	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MIBK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

H:\SR\B-MS\BMSEPA3

Notes:

1. Results are expressed in $\mu g/l$ (ppb).
2. N.D.= Not Detected

TABLE 4

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER SOURCE CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
EPA METHOD 8015
AUGUST 1992
(cont.)

DESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD
Methanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Isopropanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Butanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dicyclohexylamine (DCHA)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dimethylaniline	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

Notes:

1. Results are expressed in μg/l (ppb).
2. N.D.= Not Detected

TABLE 4

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
WET CHEMISTRY
AUGUST 1992
(cont.)

)ESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD
ield Filtered Molybdenum	N.D.	-	N.D.	N.D.	N.D.	N.D.	N.D.
H (Laboratory Standard Units)	7.7	7.8	7.3	7.2	7.5	7.2	7.6
hemical Oxygen Demand	110.	360.	27.	46.	30.	62.	32.
otal Phenol	N.D.	-	N.D.	N.D.	N.D.	N.D.	N.D.
ulfate	820.	1800.	110.	130.	590.	62.	200.
mmonia Nitrogen	N.D.	0.14	N.D.	0.15	N.D.	0.81	0.05
otal Phosphorus	0.86	3.4	0.19	0.95	0.32	0.84	.36

otes:

1. Results expressed in mg/l (ppm) unless otherwise noted.
2. N.D. = Not Detected

TABLE 5

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
VOLATILE ORGANIC COMPOUNDS
AUGUST 1993

ESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD	PW-5T	PW-6T	PW-6L	PW-6F
nzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
omodichloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
omoform	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
omomethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
rbon Tetrachloride	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
lorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
loroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroethylvinyl Ether	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
loroform	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	3	N.D.
loromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
romochloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-Dichlorobenzene	19	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-Dichlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-Dichlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
hlorodifluoromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-Dichloroethane	1	N.D.	2	2	N.D.	N.D.	N.D.	N.D.	N.D.	2	N.D.
-Dichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-Dichloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-Dichloroethylene (total)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	6	N.D.
hloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-Dichloropropane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-1,3-Dichloropropylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
ns-1,3-Dichloropropylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
ylbenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
,2,2-Tetrachloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
,1,2-Tetrachloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
rachloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	2	N.D.
uene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
,1-Trichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	11	N.D.
,2-Trichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
chloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
chlorofluoromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
yl Chloride	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
ene (total)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
etone	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

tes:

1. Results expressed in $\mu g/l$ (ppb)
2. N.D.= Not Detected

TABLE 5

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
VOLATILE ORGANIC COMPOUNDS
AUGUST 1993
(cont.)

DESCRIPTION	MW35-1	MW35-2	MW35-3	MW77-1	MW77-2	MW77-3
Benzene	N.D.	*	*	N.D.	*	N.D.
Bromodichloromethane	N.D.	*	*	N.D.	*	N.D.
Bromoform	N.D.	*	*	N.D.	*	N.D.
Bromomethane	N.D.	*	*	N.D.	*	N.D.
Carbon Tetrachloride	N.D.	*	*	N.D.	*	N.D.
Chlorobenzene	9	*	*	N.D.	*	N.D.
Chloroethane	N.D.	*	*	N.D.	*	N.D.
2-Chloroethylvinyl Ether	N.D.	*	*	N.D.	*	N.D.
Chloroform	N.D.	*	*	N.D.	*	N.D.
Chloromethane	N.D.	*	*	N.D.	*	N.D.
Dibromochloromethane	N.D.	*	*	N.D.	*	N.D.
1,2-Dichlorobenzene	N.D.	*	*	N.D.	*	N.D.
1,3-Dichlorobenzene	N.D.	*	*	N.D.	*	N.D.
1,4-Dichlorobenzene	N.D.	*	*	N.D.	*	N.D.
Dichlorodifluoromethane	N.D.	*	*	N.D.	*	N.D.
1,1-Dichloroethane	N.D.	*	*	N.D.	*	N.D.
1,2-Dichloroethane	N.D.	*	*	N.D.	*	N.D.
1,1-Dichloroethylene	N.D.	*	*	N.D.	*	N.D.
1,2-Dichloroethylene (total)	N.D.	*	*	N.D.	*	N.D.
Dichloromethane	N.D.	*	*	N.D.	*	N.D.
1,2-Dichloropropane	N.D.	*	*	N.D.	*	N.D.
cis-1,3-Dichloropropylene	N.D.	*	*	N.D.	*	N.D.
trans-1,3-Dichloropropylene	N.D.	*	*	N.D.	*	N.D.
Ethylbenzene	N.D.	*	*	N.D.	*	N.D.
1,1,2,2-Tetrachloroethane	N.D.	*	*	N.D.	*	N.D.
1,1,1,2-Tetrachloroethane	N.D.	*	*	N.D.	*	N.D.
Tetrachloroethylene	N.D.	*	*	N.D.	*	N.D.
Toluene	N.D.	*	*	N.D.	*	N.D.
1,1,1-Trichloroethane	N.D.	*	*	N.D.	*	N.D.
1,1,2-Trichloroethane	N.D.	*	*	N.D.	*	N.D.
Trichloroethylene	N.D.	*	*	N.D.	*	N.D.
Trichlorofluoromethane	N.D.	*	*	N.D.	*	N.D.
Vinyl Chloride	N.D.	*	*	N.D.	*	N.D.
Xylene (total)	N.D.	*	*	N.D.	*	N.D.
Acetone	N.D.	*	*	N.D.	*	N.D.
MIBK	N.D.	*	*	N.D.	*	N.D.

Notes:

1. Results expressed in μg/l (ppb)
2. N.D.= Not Detected
3. * = Monitoring well was dry during sampling period

H:\SR\B-MS\SSVOC-4

TABLE 5

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
EPA METHOD 8015
AUGUST 1993
(cont.)

DESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD	PW-5T	PW-6T	PW-6L	PW-6F
Methanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Isopropanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Butanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Isobutanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dicyclohexylamine (DCHA)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dimethylaniline (DMA)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

Notes:

1. Results are expressed in $\mu g/l$ (ppb)
2. N.D. = Not Detected

TABLE 5

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
EPA METHOD 8015
AUGUST 1993
(cont.)

DESCRIPTION	MW35-1	MW35-2	MW35-3	MW77-1	MW77-2	MW77-3
Methanol	N.D.	*	*	N.D.	*	N.D.
Isopropanol	N.D.	*	*	N.D.	*	N.D.
Butanol	N.D.	*	*	N.D.	*	N.D.
Isobutanol	N.D.	*	*	N.D.	*	N.D.
Dicyclohexylamine (DCHA)	N.D.	*	*	N.D.	*	N.D.
Dimethylaniline (DMA)	N.D.	*	*	N.D.	*	N.D.

Notes:

1. Results are expressed in μg/l (ppb)
2. N.D. = Not Detected
3. * = Monitoring well was dry during sampling period

H:\SR\B-MS\ss8015-4

TABLE 5

BRISTOL – MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
WET CHEMISTRY
AUGUST 1993
(cont.)

DESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD	PW-5T	PW-6T	PW-6L	PW-6F
Field Filtered Molybdenum	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
pH (Laboratory Standard Units)	7.7	7.7	7.3	7.3	7.6	7.1	7.6	7.1	7.4	8.0	7.5
Chemical Oxygen Demand	18	11	13	18	13	29	N.D.	510	47	78	110
Total Phenol	N.D.	N.D.	N.D.	0.005	N.D.	N.D.	N.D.	0.005	N.D.	N.D.	N.D.
Sulfate	800	1800	120	130	610	51	210	1500	1800	470	62
Ammonia Nitrogen	0.37	0.24	0.34	0.63	0.26	1.0	0.30	1.1	2.8	2.1	24
Total Phosphorus	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	29	1.4	2.5

Notes:

1. Results are expressed in mg/l (ppm)
2. N.D. = Not Detected

TABLE 5

BRISTOL – MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
WET CHEMISTRY
AUGUST 1993
(cont.)

DESCRIPTION	MW35-1	MW35-2	MW35-3	MW77-1	MW77-2	MW77-3
Field Filtered Molybdenum	N.D.	*	*	N.D.	*	N.D.
pH (Laboratory Standard Units)	7.1	*	*	7.0	*	7.0
Chemical Oxygen Demand	190	*	*	250	*	260
Total Phenol	N.D.	*	*	N.D.	*	N.D.
Sulfate	200	*	*	38	*	22
Ammonia Nitrogen	2.7	*	*	0.62	*	0.71
Total Phosphorus	N.D.	*	*	N.D.	*	N.D.

Notes:

1. Results are expresed in mg/l(ppm)
2. N.D. = Not Detected
3. * = Monitoring well was dry during sampling period

H:\SR\B-MS\SSwet-4

TABLE 6
BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
VOLATILE ORGANIC COMPOUNDS
OCTOBER 1993

ESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD	PW-5T	PW-6T	PW-6L	PW-6F
nzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
omodichloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
omoform	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
omomethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
rbon Tetrachloride	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
lorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
loroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chloroethylvinyl Ether	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
loroform	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
loromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
romochloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2-Dichlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
3-Dichlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
4-Dichlorobenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
chlorodifluoromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1-Dichloroethane	N.D.	N.D.	1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2-Dichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1-Dichloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2-Dichloroethylene (total)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
chloromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2-Dichloropropane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
-1,3-Dichloropropylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
ns-1,3-Dichloropropylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
ylbenzene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
,2,2-Tetrachloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
trachloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
luene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
,1-Trichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
,2-Trichloroethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
chloroethylene	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
chlorofluoromethane	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
yl Chloride	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
lene (total)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
etone	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

tes:

1. Results expressed in $\mu g/l$ (ppb)
2. N.D.= Not Detected

H:\MM\VOC5

TABLE 6
BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
VOLATILE ORGANIC COMPOUNDS
OCTOBER 1993
(cont.)

DESCRIPTION	MW35-1	MW35-2	MW35-3	MW77-1	MW77-2	MW77-3
Benzene	N.D.	*	*	N.D.	N.D.	N.D.
Bromodichloromethane	N.D.	*	*	N.D.	N.D.	N.D.
Bromoform	N.D.	*	*	N.D.	N.D.	N.D.
Bromomethane	N.D.	*	*	N.D.	N.D.	N.D.
Carbon Tetrachloride	N.D.	*	*	N.D.	N.D.	N.D.
Chlorobenzene	10	*	*	N.D.	N.D.	N.D.
Chloroethane	N.D.	*	*	N.D.	N.D.	N.D.
2-Chloroethylvinyl Ether	N.D.	*	*	N.D.	N.D.	N.D.
Chloroform	N.D.	*	*	N.D.	N.D.	N.D.
Chloromethane	N.D.	*	*	N.D.	N.D.	N.D.
Dibromochloromethane	N.D.	*	*	N.D.	N.D.	N.D.
1,2-Dichlorobenzene	N.D.	*	*	N.D.	N.D.	N.D.
1,3-Dichlorobenzene	N.D.	*	*	N.D.	N.D.	N.D.
1,4-Dichlorobenzene	N.D.	*	*	N.D.	N.D.	N.D.
Dichlorodifluoromethane	N.D.	*	*	N.D.	N.D.	N.D.
1,1-Dichloroethane	N.D.	*	*	N.D.	N.D.	N.D.
1,2-Dichloroethane	N.D.	*	*	N.D.	N.D.	N.D.
1,1-Dichloroethylene	N.D.	*	*	N.D.	N.D.	N.D.
1,2-Dichloroethylene (total)	N.D.	*	*	N.D.	N.D.	N.D.
Dichloromethane	N.D.	*	*	N.D.	N.D.	N.D.
1,2-Dichloropropane	N.D.	*	*	N.D.	N.D.	N.D.
cis-1,3-Dichloropropylene	N.D.	*	*	N.D.	N.D.	N.D.
trans-1,3-Dichloropropylene	N.D.	*	*	N.D.	N.D.	N.D.
Ethylbenzene	N.D.	*	*	N.D.	N.D.	N.D.
1,1,2,2-Tetrachloroethane	N.D.	*	*	N.D.	N.D.	N.D.
Tetrachloroethylene	N.D.	*	*	N.D.	N.D.	N.D.
Toluene	N.D.	*	*	N.D.	N.D.	N.D.
1,1,1-Trichloroethane	N.D.	*	*	N.D.	N.D.	N.D.
1,1,2-Trichloroethane	N.D.	*	*	N.D.	N.D.	N.D.
Trichloroethylene	N.D.	*	*	N.D.	N.D.	N.D.
Trichlorofluoromethane	N.D.	*	*	N.D.	N.D.	N.D.
Vinyl Chloride	N.D.	*	*	N.D.	N.D.	N.D.
Xylene (total)	N.D.	*	*	N.D.	N.D.	N.D.
Acetone	N.D.	*	*	N.D.	190	N.D.
MIBK	N.D.	*	*	16	N.D.	N.D.

Notes:

1. Results expressed in μg/l (ppb)
2. N.D.= Not Detected
3. * = Monitoring well was dry during sampling period

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TABLE 6
BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
EPA METHOD 8015
OCTOBER 1993

DESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD	PW-5T	PW-6T	PW-6L	PW-6F
Methanol	N.D.	N.D.	N.D.	N.D.	N.D.	990 (4)	N.D.	N.D.	N.D.	N.D.	*
Isopropanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	*
Butanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	*
Isobutanol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	*
Dicyclohexylamine (DCHA)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	*
Dimethylaniline (DMA)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	*

Notes:

1. Results are expressed in $\mu g/l$ (ppb)
2. N.D. = Not Detected
3. * = Monitoring well was dry during sampling period
4. A subsequent sampling event on December 19, 1993 indicated that methanol was not present above the detection limit of 500 ppb.

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TABLE 6
BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
EPA METHOD 8015
OCTOBER 1993
(cont.)

DESCRIPTION	MW35-1	MW35-2	MW35-3	MW77-1	MW77-2	MW77-3
Methanol	*	*	*	N.D.	N.D.	N.D.
Isopropanol	*	*	*	N.D.	N.D.	N.D.
Butanol	*	*	*	N.D.	N.D.	N.D.
Isobutanol	*	*	*	N.D.	N.D.	N.D.
Dicyclohexylamine (DCHA)	*	*	*	N.D.	N.D.	N.D.
Dimethylaniline (DMA)	*	*	*	N.D.	N.D.	N.D.

Notes:

1. Results are expressed in μg/l (ppb)
2. N.D. = Not Detected
3. * = Monitoring well was dry during sampling period

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TABLE 6
BRISTOL – MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
WET CHEMISTRY
OCTOBER 1993
(cont.)

DESCRIPTION	PW-2T	PW-3T	PW-3MD	PW-3MS	PW-4T	PW-4LS	PW-4LD	PW-5T	PW-6T	PW-6L	PW-6F
Field Filtered Molybdenum	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	.07	N.D.	N.D.	*
pH (Laboratory Standard Units)	7.5	7.5	7.2	7.1	7.4	7.0	7.5	7.1	7.5	7.2	*
Chemical Oxygen Demand	54	64	18	25	130	82	130	540	150	120	*
Total Phenol	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	*
Sulfate	400	1800	130	160	620	47	210	1200	1900	800	*
Ammonia Nitrogen	0.22	0.41	0.59	0.41	0.20	1.6	N.D.	0.84	1.6	1.1	*
Total Phosphorus	0.06	0.43	0.08	0.21	1.5	1.1	1.9	11	4.0	1.9	*

Notes:

1. Results are expressed in mg/l (ppm)
2. N.D. = Not Detected
3. * = Monitoring well was dry during sampling period

TABLE 6
BRISTOL – MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY

STORM SEWER CONTAMINANT SOURCE INVESTIGATION
GROUND WATER MONITORING
WET CHEMISTRY
OCTOBER 1993
(cont.)

DESCRIPTION	MW35-1	MW35-2	MW35-3	MW77-1	MW77-2	MW77-3
Field Filtered Molybdenum	*	*	*	N.D.	*	N.D.
pH (Laboratory Standard Units)	*	*	*	7.0	*	7.1
Chemical Oxygen Demand	*	*	*	140	*	91
Total Phenol	*	*	*	N.D.	*	N.D.
Sulfate	*	*	*	420	*	29
Ammonia Nitrogen	*	*	*	1.1	*	0.39
Total Phosphorus	*	*	*	0.84	*	0.66

Notes:

1. Results are expresed in mg/l(ppm)
2. N.D. = Not Detected
3. * = Monitoring well was dry during sampling period

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TABLE 7

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY
GROUND WATER ANALYTICAL SUMMARY

PARAMETER	EPA METHOD	PERIMETER WELLS															GROUND WATER QUALITY STANDARDS
		PW-2T			PW-3T			PW-3MD			PW-3MS			PW-4T			
		8/92	8/93	10/93	8/92	8/93	10/93	8/92	8/93	10/93	8/92	8/93	10/93	8/92	8/93	10/93	
VOLATILE ORGANIC COMPOUNDS (ppb)																	
Chlorobenzene	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	5
Chloroform	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	7
1,2-Dichlorobenzene	8010/8020	28	19	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	4.7
1,1-Dichloroethane	8010/8020	1	1	N.D.	N.D.	N.D.	N.D.	2	2	1	2	2	N.D.	N.D.	N.D.	N.D.	5
1,2-Dichloroethane	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	5
Tetrachloroethylene	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	5
1,1,1-Trichloroethane	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	5
Acetone	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	50**
Methyl Isobutyl Ketone	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	-
ALCOHOLS (ppb)																	
Methanol	8015	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	-
WET CHEMISTRY (ppm)																	
Chemical Oxygen Demand	410.4	110	18	54	360	11	64	27	13	18	46	18	25	30	13	130	-
Total Phenols	420.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	.005	N.D.	N.D.	N.D.	N.D.	.001
Sulfate	375.2	820	800	400	1800	1800	1800	110	120	130	130	130	160	590	610	620	250
Ammonia, Nitrogen	350.1	N.D.	0.37	0.22	0.14	0.24	0.41	N.D.	0.34	0.59	0.15	0.63	0.41	N.D.	0.26	0.20	2
Total Phosphorus	365.4	0.86	N.D.	0.06	3.4	N.D.	0.43	0.19	N.D.	0.08	0.95	N.D.	0.21	0.32	N.D.	1.5	-

Notes:

1. N.D. = Not Detected
2. * = Monitoring well dry during sampling period.
3. ** = Ground water guidance value per 6 NYCRR Part 703.
4. - = No current ground water standard per 6 NYCRR Part 703.

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TABLE 7

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY
GROUND WATER ANALYTICAL SUMMARY
(cont.)

PARAMETER	EPA METHOD	PERIMETER WELLS														GROUND WATER QUALITY STANDARDS
		PW-4LS			PW-4LD			PW-5T		PW-6T		PW-6L		PW-6F		
		8/92	8/93	10/93	8/92	8/93	10/93	8/93	10/93	8/93	10/93	8/93	10/93	8/93	10/93	
VOLATILE ORGANIC COMPOUNDS (ppb)																
Chlorobenzene	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	5
Chloroform	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	3	N.D.	N.D.	N.D.	7
1,2-Dichlorobenzene	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	4.7
1,1-Dichloroethane	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	2	N.D.	N.D.	N.D.	5
1,2-Dichloroethane	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	6	N.D.	N.D.	N.D.	5
Tetrachloroethylene	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	2	N.D.	N.D.	N.D.	5
1,1,1-Trichloroethane	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	11	N.D.	N.D.	N.D.	5
Acetone	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	50**
Methyl Isobutyl Ketone	8010/8020	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	-
ALCOHOLS (ppb)																
Methanol	8015	N.D.	N.D.	990	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	-
WET CHEMISTRY (ppm)																
Chemical Oxygen Demand	410.4	62	29	82	32	N.D.	130	510	540	47	150	78	120	110	*	-
Total Phenols	420.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	*	.001
Sulfate	375.2	62	51	47	200	210	210	1500	1200	1800	1900	470	800	62	*	250
Ammonia, Nitrogen	350.1	0.81	1.0	1.6	0.05	0.30	N.D.	1.1	0.84	2.8	1.6	2.1	1.1	24	*	2
Total Phosphorus	365.4	0.84	N.D.	1.1	0.36	N.D.	1.9	N.D.	11	29	4.0	1.4	1.9	2.5	*	-

Notes:

1. N.D. = Not Detected
2. * = Monitoring well dry during sampling period.
3. ** = Ground water guidance value per 6 NYCRR Part 703.
4. - = No current ground water standard per 6 NYCRR Part 703.

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TABLE 7

BRISTOL-MYERS SQUIBB COMPANY
THOMPSON ROAD FACILITY
GROUND WATER ANALYTICAL SUMMARY
(cont.)

PARAMETER	EPA METHOD	NOTCH WELLS												GROUND WATER QUALITY STANDARDS
		MW35-1		MW35-2		MW35-3		MW77-1		MW77-2		MW77-3		
		8/93	10/93	8/93	10/93	8/93	10/93	8/93	10/93	8/93	10/93	8/93	10/93	
VOLATILE ORGANIC COMPOUNDS (ppb)														
Chlorobenzene	8010/8020	9	10	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	5
Chloroform	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	7
1,2-Dichlorobenzene	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	4.7
1,1-Dichloroethane	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	5
1,2-Dichloroethane	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	5
Tetrachloroethylene	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	5
1,1,1-Trichloroethane	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	5
Acetone	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	190	N.D.	N.D.	50**
Methyl Isobutyl Ketone	8010/8020	N.D.	N.D.	*	*	*	*	N.D.	16	*	N.D.	N.D.	N.D.	-
ALCOHOLS (ppb)														
Methanol	8015	N.D.	N.D.	*	*	*	*	N.D.	N.D.	*	N.D.	N.D.	N.D.	-
WET CHEMISTRY (ppm)														
Chemical Oxygen Demand	410.4	190	*	*	*	*	*	250	140	*	*	260	91	-
Total Phenols	420.1	N.D.	*	*	*	*	*	N.D.	N.D.	*	*	N.D.	N.D.	.001
Sulfate	375.2	200	*	*	*	*	*	38	420	*	*	22	29	250
Ammonia, Nitrogen	350.1	2.7	*	*	*	*	*	0.62	1.1	*	*	0.71	0.39	2
Total Phosphorus	365.4	N.D.	*	*	*	*	*	N.D.	0.84	*	*	N.D.	0.66	-

Notes:

1. N.D. = Not Detected
2. * = Monitoring well dry during sampling period.
3. ** = Ground water guidance value per 6 NYCRR Part 703.
4. - = No current ground water standard per 6 NYCRR Part 703.

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APPENDIX C

NYSDEC 1996 and 1997 Sediment Sampling Data

South Branch of Ley Creek

Source: NYSDEC/TAMS Onondaga Lake Data Management System

Table C-1
Concentrations of Metals in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

	Units	LEL[1]	SEL[1]	S110	L27	S109	S108	L26	S107
DATE				10/28/97	11/14/96	10/28/97	10/28/97	11/14/96	10/28/97
Approximate location in relation to Bristol Myers Thompson Road site				400 feet upstream; behind East Syracuse Cogeneration Facility	Near the southern (upstream) limit of the Bristol property; 200' downstream of Burnet Ave.	Near the northern (downstream) limit of the site; upstream of Headson's Brook	Located within Headson's Brook; downstream along the northern perimeter of the Bristol Property	Downstream of Bristol site; near SE corner of Wegmans parking lot	Downstream of Bristol site; north of James Street near Wegmans
Aluminum	mg/kg			**8800**	**3530**	**9840**	**5760**	**5270**	**3520**
Antimony	mg/kg	2	25	1.2 UJ	0.82 UJ	0.94 UJ	0.83 UJ	0.85 UJ	0.92 UJ
Arsenic	mg/kg	6	33	**4.9**	**3.6**	**4.7**	**6.6**	**3.8**	**2.9**
Barium	mg/kg			**106**	**196**	**78.5**	**109**	**316**	**35.5**
Beryllium	mg/kg			**0.47**	**0.24**	**0.48**	**0.36**	**0.32**	**0.27**
Cadmium	mg/kg	0.60	9	**9**	**1.5**	**1.20**	**0.17**	**1.2**	**1.50**
Calcium	mg/kg			**130000**	**193000**	**37200**	**40800**	**143000**	**147000**
Chromium	mg/kg	26	110	**39.9**	**20.5**	**26.6**	**10.6**	**27.2**	**24**
Cobalt	mg/kg			**7.9**	**3.8**	**7.7**	**5.8**	**6.1**	**3.6**
Copper	mg/kg	16	110	**69.8 J**	**52.4 J**	**38.4 J**	**23.2 J**	**42 J**	**73.8 J**
Iron	mg/kg	2%	4%	**19500**	**10100**	**18500**	**14400**	**11300**	**14400**
Lead	mg/kg	31	110	**201**	**134 J**	**74**	**20.7**	**77.3 J**	**61**
Magnesium	mg/kg			**27100**	**18600**	**9720**	**8720**	**18600**	**16200**
Manganese	mg/kg	460	1100	**493**	**254**	**239**	**334**	**307**	**239**
Mercury	mg/kg	0.15	1.3	**1.1**	**0.10**	**0.16**	0.06 U	**0.12**	0.07 U
Nickel	mg/kg	16	50	**31.6**	**14.8**	**20.60**	**12.9**	**18.2**	**20.50**
Potassium	mg/kg			**1640**	**1380**	**1850**	**1240**	**1470**	**730**
Selenium	mg/kg			1.1 U	**0.44**	0.88 U	0.77 U	**0.60**	0.85 U
Silver	mg/kg	1	2.2	0.35 U	**0.17**	0.28 U	0.25 U	**0.13**	**0.61**
Sodium	mg/kg			**1420**	**495**	**226**	**180**	**409**	**308**
Thallium	mg/kg			1 U	0.58 U	0.81 U	0.72 U	0.60 U	0.79 U
Vanadium	mg/kg			**24.6**	**18**	**35.2**	**16.8**	**28.20**	**14.70**
Zinc	mg/kg	120	270	**303**	**206 J**	**141**	**54.8**	**811 J**	**146**
Cyanide	mg/kg			0.98 U	0.76 U	0.78 U	0.69 U	0.79 U	0.76 U

Notes:
1) Sediment screening criteria for inorganics based on the Lowest Effect or Severe Effect Level. Source: NYSDEC Division of Fish, Wildlife and Marine Resources.Technical Guidance for Screening Contaminated Sediments, Jan. 1999.
2) Location descriptions based on NYSDEC's field notes.
3) Bold type represents detections. Light shading indicates concentrations exceed the LEL (Lowest Effect Level). Darker shading indicates concentrations also exceed the SEL (Severe Effect Level).

Table C-2
Concentrations of VOCs in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

SAMPLE ID DATE	Units	NYSDEC Sediment Criteria[1]	S110 10/28/97	NYSDEC Sediment Criteria[1]	L27 11/14/96	NYSDEC Sediment Criteria[1]	S109 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		400 feet upstream; behind East Syracuse Cogeneration Facility		Near the southern (upstream) limit of the Bristol property; 200' downstream of Burnet Ave.		Near the northern (downstream) limit of the site; upstream of Headson's Brook	
Total Organic Carbon (TOC)	mg/kg		70,900		44,000 [1]		45,900
VOCs							
Chloromethane	ug/kg		20 UJ		15 U		16 UJ
Bromomethane	ug/kg		20 U		15 U		16 U
Vinyl chloride[2]	ug/kg	4.96	20 U	3.08	15 U	3.21	16 U
Chloroethane	ug/kg		20 U		15 U		16 U
Methylene chloride	ug/kg		20 U		15 U		16 U
Acetone	ug/kg		**67 J**		**37**		**81 J**
Carbon disulfide	ug/kg		20 U		**11 J**		16 U
1,1-Dichloroethene	ug/kg		20 U		15 U		16 U
1,1-Dichloroethane	ug/kg		20 U		15 U		16 U
1,2-Dichloroethene (Total)	ug/kg		20 U		15 U		16 U
Chloroform	ug/kg		20 U		15 U		16 U
1,2-Dichloroethane	ug/kg		20 U		15 U		16 U
2-Butanone (MEK)	ug/kg		**26**		**12 J**		**28**
1,1,1-Trichloroethane	ug/kg		20 U		15 U		16 U
Carbon Tetrachloride[2]	ug/kg	42.54	20 U	26.4	15 U	28	16 U
Bromodichloromethane	ug/kg		20 U		15 U		16 U
1,2-Dichloropropane	ug/kg		20 U		15 U		16 U
Cis-1,3-dichloropropene	ug/kg		20 U		15 U		16 U
Trichloroethene[2]	ug/kg	141.8	20 U	88	15 U	92	16 U
Dibromochloromethane	ug/kg		20 U		15 U		16 U
1,1,2-Trichloroethane[2]	ug/kg	42.54	20 U	26.4	15 U	27.54	16 U
Benzene	ug/kg	1985.2	20 U	1232	15 U	1285.2	16 U
Trans-1,3-dichloropropene	ug/kg		20 U		15 U		16 U
Bromoform	ug/kg		20 U		15 U		16 U
4-Methyl-2-pentanone (MIBK)	ug/kg		20 UJ		15 U		16 UJ
2-Hexanone	ug/kg		20 U		15 UJ		16 U
Tetrachloroethene	ug/kg		20 U		15 UJ		16 U
1,1,2,2-Tetrachloroethane	ug/kg		20 UJ		15 UJ		16 UJ
Toluene	ug/kg	3474	20 U	2156	15 UJ	2249	16 U
Chlorobenzene	ug/kg	248.15	**12 J**	154	15 UJ	160.65	16 U
Ethylbenzene	ug/kg	1701.6	20 U	1056	15 UJ	1101.6	16 U
Styrene	ug/kg		20 U		15 UJ		16 U
Xylene (Total)	ug/kg	6522.8	20 U	4048	15 UJ	4222.8	16 U

Table C-2
Concentrations of VOCs in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

SAMPLE ID DATE	Units	NYSDEC Sediment Criteria[1]	S108 10/28/97	NYSDEC Sediment Criteria[1]	L26 11/14/96	NYSDEC Sediment Criteria[1]	S107 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		Located within Headson's Brook; downstream along the northern perimeter of the Bristol Property		Downstream of Bristol site; near SE corner of Wegmans parking lot		Downstream of Bristol site; north of James Street near Wegmans	
Total Organic Carbon (TOC)	mg/kg		64,000		44,000 [1]		44,000
VOCs							
Chloromethane	ug/kg		**9 J**		14 U		15 UJ
Bromomethane	ug/kg		14 U		14 U		15 U
Vinyl chloride[2]	ug/kg	4.48	14 U	3.08	14 U	3.08	15 U
Chloroethane	ug/kg		14 U		14 U		15 U
Methylene chloride	ug/kg		14 U		14 U		15 U
Acetone	ug/kg		14 UJ		14 U		**13 J**
Carbon disulfide	ug/kg		14 U		**2 J**		**2 J**
1,1-Dichloroethene	ug/kg		14 U		14 U		15 U
1,1-Dichloroethane	ug/kg		14 U		14 U		15 U
1,2-Dichloroethene (Total)	ug/kg		14 U		14 U		15 U
Chloroform	ug/kg		14 U		14 U		15 U
1,2-Dichloroethane	ug/kg		14 U		14 U		15 U
2-Butanone (MEK)	ug/kg		14 U		14 U		15 U
1,1,1-Trichloroethane	ug/kg		14 U		14 U		15 U
Carbon Tetrachloride[2]	ug/kg	38.4	14 U	26.4	14 U	26.4	15 U
Bromodichloromethane	ug/kg		14 U		14 U		15 U
1,2-Dichloropropane	ug/kg		14 U		14 U		15 U
Cis-1,3-dichloropropene	ug/kg		14 U		14 U		15 U
Trichloroethene[2]	ug/kg	142	14 U	88	14 U	88	15 U
Dibromochloromethane	ug/kg		14 U		14 U		15 U
1,1,2-Trichloroethane[2]	ug/kg	38.4	14 U	26.4	14 U	26.4	15 U
Benzene	ug/kg	1792	14 U	1232	14 U	1232	15 U
Trans-1,3-dichloropropene	ug/kg		14 U		14 U		15 U
Bromoform	ug/kg		14 U		14 U		15 U
4-Methyl-2-pentanone (MIBK)	ug/kg		14 UJ		14 U		15 UJ
2-Hexanone	ug/kg		14 U		14 U		15 U
Tetrachloroethene	ug/kg		14 U		14 U		15 U
1,1,2,2-Tetrachloroethane	ug/kg		14 UJ		14 U		15 UJ
Toluene	ug/kg	3136	14 U	2156	14 U	2156	15 U
Chlorobenzene	ug/kg	224	14 U	154	14 U	154	15 U
Ethylbenzene	ug/kg	1536	14 U	1056	14 U	1056	15 U
Styrene	ug/kg		14 U		14 U		15 U
Xylene (Total)	ug/kg	5888	14 U	4048	14 U	4048	15 U

Notes:
1) Sediment screening criteria for VOCs based on either the Benthic Aquatic Life Chronic Toxicity or Wildlife Bioaccumulation values. Source: NYSDEC, Division of Fish, Wildlife, and Marine Resources. Technical Guidance for Screening Contaminated Sediments, Jan. 1999. Criteria adjusted for sample - specific TOC. TOC was not analyzed in samples L-26 and L-27; criteria for these two locations are based on the lowest TOC from the four 1997 samples (44,000 mg/kg).
2) Values for sediment screening criteria are based on Human Health Bioaccumulation.
3) Bold type represents detections.

Table C-3
Concentrations of SVOCs in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

SAMPLE ID DATE	Units	NYSDEC Sediment Criteria[1]	S110 10/28/97	NYSDEC Sediment Criteria[1]	L27 11/14/96	NYSDEC Sediment Criteria[1]	S109 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		400 feet upstream; behind East Syracuse Cogeneration Facility		Near the southern (upstream) limit of the Bristol property; 200' downstream of Burnet Ave.		Near the northern (downstream) limit of the site; upstream of Headson's Brook	
Total Organic Carbon (TOC)	mg/kg		70,900		44,000 [1]		45,900
SVOCs							
Phenol	ug/kg	42.54	1300 U	26.4	510 U	27.54	1000 U
Bis(2-chloroethyl)ether[2]	ug/kg	2.127	1300 U	1.32	510 U	1.38	1000 U
2-Chlorophenol	ug/kg		1300 U		510 U		1000 U
1,3-Dichlorobenzene	ug/kg	850.8	1300 U	528	510 U	550.8	1000 U
1,4-Dichlorobenzene	ug/kg	850.8	1300 U	528	510 U	550.8	1000 U
1,2-Dichlorobenzene	ug/kg	850.8	**160 JD**	528	510 U	550.8	1000 U
2-Methylphenol	ug/kg		1300 U		510 U		1000 U
2,2'-Oxybis(1-chloropropane)	ug/kg		1300 U		510 U		1000 U
4-Methylphenol	ug/kg		1300 U		**130 J**		1000 U
N-nitroso-di-n-propylamine	ug/kg		1300 U		510 U		1000 U
Hexachloroethane	ug/kg		1300 U		510 U		1000 U
Nitrobenzene	ug/kg		1300 U		510 U		1000 U
Isophorone	ug/kg		1300 U		510 U		1000 U
2-Nitrophenol	ug/kg		1300 U		510 U		1000 U
2,4-Dimethylphenol	ug/kg		1300 U		510 U		1000 U
Bis(2-chloroethoxy)methane	ug/kg		1300 U		510 U		1000 U
2,4-Dichlorophenol	ug/kg		1300 U		510 U		1000 U
1,2,4-Trichlorobenzene	ug/kg	6451.9	1300 U	4004	510 U	4176.9	1000 U
Naphthalene	ug/kg	2127	1300 U	1320	**550**	1377	**220 JD**
4-Chloroaniline	ug/kg		R		510 UJ		1000 UJ
Hexachlorobutadiene	ug/kg	283.6	1300 U	176	510 U	183.6	1000 U
4-Chloro-3-methylphenol	ug/kg		1300 U		510 U		1000 U
2-Methylnaphthalene	ug/kg	2410.6	1300 U	1496	**440 J**	1560.6	**200 JD**
Hexachlorocyclopentadiene	ug/kg	311.96	1300 U	193.6	510 U	201.96	1000 UJ
2,4,6-Trichlorophenol	ug/kg		1300 U		510 U		1000 U
2,4,5-Trichlorophenol	ug/kg		3300 U		1300 U		2600 U
2-Chloronaphthalene	ug/kg		1300 U		510 U		1000 U
2-Nitroaniline	ug/kg		3300 U		1300 U		2600 U
Dimethylphthalate	ug/kg		1300 U		510 U		1000 U
Acenaphthylene	ug/kg		**440 JD**		**1500**		**910 JD**
2,6-Dinitrotoluene	ug/kg		1300 U		510 U		1000 U
3-Nitroaniline	ug/kg		3300 UJ		1300 U		2600 U
Acenaphthene	ug/kg		**170 JD**		**2200**		**550 JD**

Table C-3
Concentrations of SVOCs in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

SAMPLE ID DATE	Units	NYSDEC Sediment Criteria[1]	S110 10/28/97	NYSDEC Sediment Criteria[1]	L27 11/14/96	NYSDEC Sediment Criteria[1]	S109 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		400 feet upstream; behind East Syracuse Cogeneration Facility		Near the southern (upstream) limit of the Bristol property; 200' downstream of Burnet Ave.		Near the northern (downstream) limit of the site; upstream of Headson's Brook	
Total Organic Carbon (TOC)	mg/kg		70,900		44,000 [1]		45,900
SVOCs (continued)							
2,4-Dinitrophenol	ug/kg		3300 UJ		1300 UJ		2600 UJ
4-Nitrophenol	ug/kg		3300 UJ		1300 U		2600 UJ
Dibenzofuran	ug/kg		**140 JD**		**1200**		**290 JD**
2,4-Dinitrotoluene	ug/kg		1300 U		510 U		1000 U
Diethylphthalate	ug/kg		1300 U		510 U		1000 U
4-Chlorophenyl-phenyl ether	ug/kg		1300 U		510 U		1000 U
Fluorene	ug/kg	567.2	**180 JD**	352	**2700**	367	**690 JD**
4-Nitroaniline	ug/kg		R		1300 U		2600 UJ
4,6-Dinitro-2-methylphenol	ug/kg		3300 U		1300 UJ		2600 UJ
N-Nitrosodiphenylamine(1)	ug/kg		1300 UJ		510 U		1000 UJ
4-Bromophenyl-phenyl ether	ug/kg		1300 U		510 U		1000 U
Hexachlorobenzene	ug/kg	850.8	1300 U	528	510 U	550.8	1000 U
Pentachlorophenol	ug/kg	2836	3300 UJ	1760	1300 U	1836	2600 U
Phenanthrene	ug/kg	8508	**1300 D**	5280	**27000 E**	5508	**5700 D**
Anthracene	ug/kg	7586.3	**710 JD**	4708	**7600 JD**	4911.3	**2000 D**
Carbazole	ug/kg		**190 JD**		510 U		**1200 D**
Di-n-butylphthalate	ug/kg		1300 U		510 U		1000 U
Fluoranthene	ug/kg	72318	**4000 D**	44880	**45000 D**	46818	**11000 D**
Pyrene	ug/kg	68134.9	**4000 D**	42284	**40000 D**	44109.9	**9300 D**
Butylbenzylphthalate	ug/kg		**180 JD**		**34000 D**		**340 JD**
3,3-Dichlorobenzidine	ug/kg		1300 UJ		510 U		1000 U
Benzo(a)anthracene[2]	ug/kg	92.17	**1900 D**	57.2	**22000 D**	59.67	**5500 D**
Chrysene[2]	ug/kg	92.17	**2700 D**	57.2	**22000 D**	59.67	**6700 D**
Bis(2-ethylhexyl)phthalate	ug/kg		**1900 D**		**3300**		**2300 D**
Di-n-octylphthalate	ug/kg		1300 UJ		510 U		**170 JD**
Benzo(b)fluoranthene[2]	ug/kg	92.17	**2600 D**	57.2	**17000 D**	59.67	**6600 JD**
Benzo(k)fluoranthene[2]	ug/kg	92.17	**2600 D**	57.2	510 U	59.67	**5500 JD**
Benzo(a)pyrene[2]	ug/kg	92.17	**2500 D**	57.2	**20000 D**	59.67	**6000 JD**
Indeno(1,2,3-cd)pyrene[2]	ug/kg	92.17	**1200 JD**	57.2	**700**	59.67	**2200 JD**
Dibenz(a,h)anthracene	ug/kg		1300 U		510 U		1000 UJ
Benzo(g,h,i)perylene	ug/kg		**1200 JD**		**2900**		**1800 JD**

Table C-3
Concentrations of SVOCs in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

SAMPLE ID DATE	Units	NYSDEC Sediment Criteria[1]	S108 10/28/97	NYSDEC Sediment Criteria[1]	L26 11/14/96	NYSDEC Sediment Criteria[1]	S107 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		Located within Headson's Brook; downstream along the northern perimeter of the Bristol Property		Downstream of Bristol site; near SE corner of Wegmans parking lot		Downstream of Bristol site; north of James Street near Wegmans	
Total Organic Carbon (TOC)	mg/kg		64,000		44,000 [1]		44,000
SVOCs							
Phenol	ug/kg	38.4	460 U	26.4	530 U	26.4	1000 U
Bis(2-chloroethyl)ether[2]	ug/kg	1.92	460 U	1.32	530 U	1.32	1000 U
2-Chlorophenol	ug/kg		460 U		530 U		1000 U
1,3-Dichlorobenzene	ug/kg	768	460 U	528	530 U	528	1000 U
1,4-Dichlorobenzene	ug/kg	768	460 U	528	530 U	528	1000 U
1,2-Dichlorobenzene	ug/kg	768	460 U	528	**120 J**	528	1000 U
2-Methylphenol	ug/kg		460 U		530 U		1000 U
2,2'-Oxybis(1-chloropropane)	ug/kg		460 U		530 U		1000 U
4-Methylphenol	ug/kg		460 U		**71 J**		1000 U
N-nitroso-di-n-propylamine	ug/kg		460 U		530 U		1000 U
Hexachloroethane	ug/kg		460 U		530 U		1000 U
Nitrobenzene	ug/kg		460 U		530 U		1000 U
Isophorone	ug/kg		460 U		530 U		1000 U
2-Nitrophenol	ug/kg		460 U		530 U		1000 U
2,4-Dimethylphenol	ug/kg		460 U		530 U		1000 U
Bis(2-chloroethoxy)methane	ug/kg		460 U		530 U		1000 U
2,4-Dichlorophenol	ug/kg		460 U		530 U		1000 U
1,2,4-Trichlorobenzene	ug/kg	5824	460 U	4004	530 U	4004	1000 U
Naphthalene	ug/kg	1920	**260 J**	1320	**420 J**	1320	**170 JD**
4-Chloroaniline	ug/kg		460 UJ		530 UJ		1000 UJ
Hexachlorobutadiene	ug/kg	256	460 U	176	530 U	176	1000 U
4-Chloro-3-methylphenol	ug/kg		460 U		530 U		1000 U
2-Methylnaphthalene	ug/kg	2176	**260 J**	1496	**270 J**	1496	**190 JD**
Hexachlorocyclopentadiene	ug/kg	281.6	460 UJ	193.6	530 U	193.6	1000 UJ
2,4,6-Trichlorophenol	ug/kg		460 U		530 U		1000 U
2,4,5-Trichlorophenol	ug/kg		1100 U		1300 U		2500 U
2-Chloronaphthalene	ug/kg		460 U		530 U		1000 U
2-Nitroaniline	ug/kg		1100 U		1300 U		2500 U
Dimethylphthalate	ug/kg		460 U		530 U		1000 U
Acenaphthylene	ug/kg		**520**		**740**		**620 JD**
2,6-Dinitrotoluene	ug/kg		460 U		530 U		1000 U
3-Nitroaniline	ug/kg		1100 U		1300 U		2500 U
Acenaphthene	ug/kg		**130 J**		**1000**		**790 JD**

Table C-3
Concentrations of SVOCs in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

SAMPLE ID DATE LOCATION	Units	NYSDEC Sediment Criteria[1]	S108 10/28/97	NYSDEC Sediment Criteria[1]	L26 11/14/96	NYSDEC Sediment Criteria[1]	S107 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		Located within Headson's Brook; downstream along the northern perimeter of the Bristol Property		Downstream of Bristol site; near SE corner of Wegmans parking lot		Downstream of Bristol site; north of James Street near Wegmans	
Total Organic Carbon (TOC)	mg/kg		64,000		44,000 [1]		44,000
SVOCs (continued)							
2,4-Dinitrophenol	ug/kg		1100 UJ		1300 UJ		2500 UJ
4-Nitrophenol	ug/kg		1100 UJ		1300 U		2500 UJ
Dibenzofuran	ug/kg		**250 J**		**730**		**450 JD**
2,4-Dinitrotoluene	ug/kg		460 U		530 U		1000 U
Diethylphthalate	ug/kg		460 U		530 U		1000 U
4-Chlorophenyl-phenyl ether	ug/kg		460 U		530 U		1000 U
Fluorene	ug/kg	512	**160 J**	352	**1500**	352	**1100 D**
4-Nitroaniline	ug/kg		1100 UJ		1300 U		2500 UJ
4,6-Dinitro-2-methylphenol	ug/kg		1100 UJ		1300 UJ		2500 UJ
N-Nitrosodiphenylamine(1)	ug/kg		460 UJ		530 U		1000 UJ
4-Bromophenyl-phenyl ether	ug/kg		460 U		530 U		1000 U
Hexachlorobenzene	ug/kg	768	460 U	528	530 U	528	1000 U
Pentachlorophenol	ug/kg	2560	1100 U	1760	1300 U	1760	2500 U
Phenanthrene	ug/kg	7680	**720**	5280	**16000 D**	5280	**7000 D**
Anthracene	ug/kg	6848	**450 J**	4708	**2800**	4708	**2300 D**
Carbazole	ug/kg		**120 J**		**1200**		**1400 D**
Di-n-butylphthalate	ug/kg		460 U		530 U		1000 U
Fluoranthene	ug/kg	65280	**2000**	44880	**23000 D**	44880	**11000 D**
Pyrene	ug/kg	61504	**1600**	42284	**23000 D**	42284	**9000 D**
Butylbenzylphthalate	ug/kg		460 U		530 U		1000 U
3,3-Dichlorobenzidine	ug/kg		460 U		530 U		1000 U
Benzo(a)anthracene[2]	ug/kg	83.2	**1300**	57.2	**12000 D**	57.2	**5600 D**
Chrysene[2]	ug/kg	83.2	**1400**	57.2	**14000 D**	57.2	**6400 D**
Bis(2-ethylhexyl)phthalate	ug/kg		**51 J**		**12000 D**		**920 JD**
Di-n-octylphthalate	ug/kg		460 U		530 UJ		**170 JD**
Benzo(b)fluoranthene[2]	ug/kg	83.2	**1700**	57.2	**11000 DJ**	57.2	**6600 JD**
Benzo(k)fluoranthene[2]	ug/kg	83.2	**1300**	57.2	**9100 DJ**	57.2	**7500 JD**
Benzo(a)pyrene[2]	ug/kg	83.2	**1300**	57.2	**12000 DJ**	57.2	**5800 JD**
Indeno(1,2,3-cd)pyrene[2]	ug/kg	83.2	**490**	57.2	**500 J**	57.2	**2000 JD**
Dibenz(a,h)anthracene	ug/kg		460 U		530 UJ		**1000 JD**
Benzo(g,h,i)perylene	ug/kg		**380 J**		**2300 J**		**1700 JD**

Notes:
1) Sediment screening criteria for SVOCs based on either the Benthic Aquatic Life Chronic Toxicity or Wildlife Bioaccumulation values. Source: NYSDEC Division of Fish, Wildlife, and Marine Resources. Technical Guidance for Screening Contaminated Sediments, Jan. 1999. Criteria adjusted for sample - specific TOC. TOC was not analyzed in samples L-26 and L-27; criteria for these two locations are based on the lowest TOC from the four 1997 samples (44,000 mg/kg).
2) Values for sediment screening criteria were based on Human Health Bioaccumulation.
3) Bold type represents detections. Shading indicates detected concentration exceeds the screening criteria.

Table C-4
Concentrations of PCBs in Sediment of the South Branch of Ley Creek Adjacent to the Bristol Myers Thompson Road Site

SAMPLE ID DATE	Units	NYSDEC Sediment Criteria[1,2]	S110 10/28/97	NYSDEC Sediment Criteria[1,2]	L27 11/14/96	NYSDEC Sediment Criteria[1,2]	S109 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		400 feet upstream; behind East Syracuse Cogeneration Facility		Near the southern (upstream) limit of the Bristol property; 200' downstream of Burnet Ave.		Near the northern (downstream) limit of the site; upstream of Headson's Brook	
Total Organic Carbon (TOC)	mg/kg		70,900		44,000 [1]		45,900
Polychlorinated Biphenyl (PCBs)							
Aroclor-1016	ug/kg	99.26	65 U	61.6	50 UJ	64.26	52 U
Aroclor-1221	ug/kg	99.26	130 U	61.6	100 UJ	64.26	100 U
Aroclor-1232	ug/kg	99.26	65 U	61.6	50 UJ	64.26	52 U
Aroclor-1242	ug/kg	99.26	65 U	61.6	50 UJ	64.26	52 U
Aroclor-1248	ug/kg	99.26	**47 J**	61.6	50 UJ	64.26	**66**
Aroclor-1254	ug/kg	99.26	**120 JPN**	61.6	**100 J**	64.26	**74**
Aroclor-1260	ug/kg	99.26	**71 PJ**	61.6	**38 J**	64.26	**64 PJ**

SAMPLE ID DATE	Units	NYSDEC Sediment Criteria[1,2]	S108 10/28/97	NYSDEC Sediment Criteria[1,2]	L26 11/14/96	NYSDEC Sediment Criteria[1,2]	S107 10/28/97
Approximate location in relation to Bristol Myers Thompson Road site		Located within Headson's Brook; downstream along the northern perimeter of the Bristol Property		Downstream of Bristol site; near SE corner of Wegmans parking lot		Downstream of Bristol site; north of James Street near Wegmans	
Total Organic Carbon (TOC)	mg/kg		64,000		44,000 [1]		44,000
Polychlorinated Biphenyl (PCBs)							
Aroclor-1016	ug/kg	90.16	46 U	61.6	**52 X**	61.6	50 U
Aroclor-1221	ug/kg	90.16	92 U	61.6	100 U	61.6	100 U
Aroclor-1232	ug/kg	90.16	46 U	61.6	52 U	61.6	50 U
Aroclor-1242	ug/kg	90.16	46 U	61.6	**66**	61.6	50 U
Aroclor-1248	ug/kg	90.16	46 U	61.6	52 U	61.6	50 U
Aroclor-1254	ug/kg	90.16	46 U	61.6	**96**	61.6	**42 JPN**
Aroclor-1260	ug/kg	90.16	**31 J**	61.6	**41 J**	61.6	**38 JP**

Notes:
1) Sediment screening criteria for PCBs based on Wildlife Biaccumulation values. Source: NYSDEC, Division of Fish, Wildlife and Marine Resources. Technical Guidance for Screening Contaminated Sediments, Jan. 1999. Criteria adjusted for sample - specific TOC. TOC was not analyzed in samples L-26 and L-27; criteria for these two locations are based on the lowest TOC from the four 1997 samples (44,000 mg/kg).
2) Sediment screening criteria based on total PCBs, not the individual type of Aroclor.
3) Bold type indicates detections. Shading indicates detected concentration exceeds the screening criteria.