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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

ROD

DATE: SEP 30 1985

SUBJECT: Record of Decision
Wide Beach Development Site

FROM: William J. Librizzi, Director
Emergency and Remedial Response Division

TO: Christopher J. Daggett
Regional Administrator

(1) P. Buechi
(2) Wide Beach File
~~(3)~~

Attached, please find the draft Record of Decision (ROD) prepared by my staff for the Wide Beach Development site located in the State of New York.

Under an immediate removal action performed at this site, the PCB-contaminated roadways, drainage ditches, and driveways were paved with asphalt to protect the public from PCB-contaminated roadway dust and surface water runoff. However, based upon an analysis of this action, and of site conditions, it has been determined that the asphaltic paving cannot withstand the severe winter conditions in this area, and would only last from 2-4 years. Accordingly, implementation of a long-term remedial measure is necessary.

The ROD document reflects the recommendations of the Emergency and Remedial Respond Division to address the problems associated with this hazardous waste site. Our recommendations were developed based upon the results of a number of Remedial Investigations and a Feasibility Study prepared by New York State Department of Environmental Conservation consultant EA Engineering, Science, and Technology, which included the evaluation of a number of remedial alternatives.

Specifically, we are proposing to excavate the PCB-contaminated soils from the roadways, drainage ditches, driveways, wetlands, and yards. After chemical treatment, these soils will be used as fill in the excavated areas. The excavated uncontaminated asphaltic material will be reused and the contaminated asphaltic material will be disposed of. The perched water in the sewer trenches will be extracted and treated.

Also, we are proposing to perform a pilot plant treatability study to determine an effective scheme for chemically treating the PCB-contaminated soils.

In addition, sampling for PCBs in soils from the backyards, in sewage from the lift station, and in sediment from the disconnected septic systems will be included to better define the extent of the contamination.

The proposed actions, are consistent with the goals and objectives of the Comprehensive Environmental Response, Compensation and Liability Act, and the National Contingency Plan, to provide adequate protection of public health and the environment.

We have discussed the recommended actions with the State of New York, which concurs with the proposed remedial activities.

Trust Fund monies will be utilized to finance the proposed action.

Should you have any questions regarding the ROD, do not hesitate to contact me.

Attachment

Record of Decision
Remedial Alternative Selection

Site:

Wide Beach Development site, Brant Township, New York

Documents Reviewed:

I am basing my decision on the following documents describing the analysis of the cost-effectiveness of remedial alternatives at the Wide Beach Development site:

- Wide Beach PCB Investigation--Groundwater and Soil Contamination, Erie County Department of Environment and Planning, February 1982.

- Wide Beach PCB Investigation Sampling Report, Erie County Department of Environment and Planning, November 1982.

- Evaluation of Analytical Chemical Data for Wide Beach Community, Brant Township, New York, NUS Corporation, August 12, 1983.

- Remedial Action Master Plan, NUS Corporation, November 1983.

- Presentation of Analytical Chemical Data from Drinking Water Samples Collected from Wide Beach Community, Brant Township, New York, NUS Corporation, February 14, 1984.

- Remedial Investigation Report, EA Engineering, Science and Technology, April 1985.

- Feasibility Study Report, EA Engineering, Science and Technology, August 1985.

- Responsiveness Summary

- Staff summaries, memoranda, letters, and recommendations

- Summary of Remedial Action Alternative Selection--Wide Beach Development site.

Description of Selected Remedy:

- Excavation of the PCB-contaminated soils in the roadways, drainage ditches, driveways, yards, and wetlands.
- Disposal of the contaminated asphaltic material, retaining uncontaminated asphaltic material for reuse in repaving.
- Chemical treatment of the PCB-contaminated soils.
- Use of the treated soils as fill in the excavated areas.
- Repavement of the roadways and driveways.
- Treatment of the perched water in the sewer trench.
- Construction of a hydraulic barrier at the end of the sewer trench.
- Pilot plant treatability study to determine an effective treatment scheme for chemically neutralizing the PCB-contaminated soils.
- Sampling for PCBs in soils from the back yards, sewage from the lift station, and sediments in the disconnected septic systems to better define the extent of the contamination.

Declarations:

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the selected remedial strategy for the Wide Beach Development site is a cost-effective remedy, and that it effectively mitigates and minimizes damage to, and provides adequate protection of public health, welfare, and the environment.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

It is anticipated that the treatment associated with the sewer trench perched water will be a short-term action. The recommended remedial measure, once implemented, will not require any long-term operation and maintenance expenditures, other than monitoring and minimal roadway maintenance. The actions associated with the sewer trench perched water pumping and treatment will be considered part of the approved action and eligible for Trust Fund monies for a period of one year.

The Region has consulted with the State of New York in selecting the recommended remedial action for this site. The State concurs that the selected remedial alternative is the most appropriate remedial measure for the Wide Beach Development site.

September 30, 1985
Date

Christopher J. Daggett
Regional Administrator

Summary of Remedial Alternatives Selection
Wide Beach Development

## Site Location and Description

### °Location

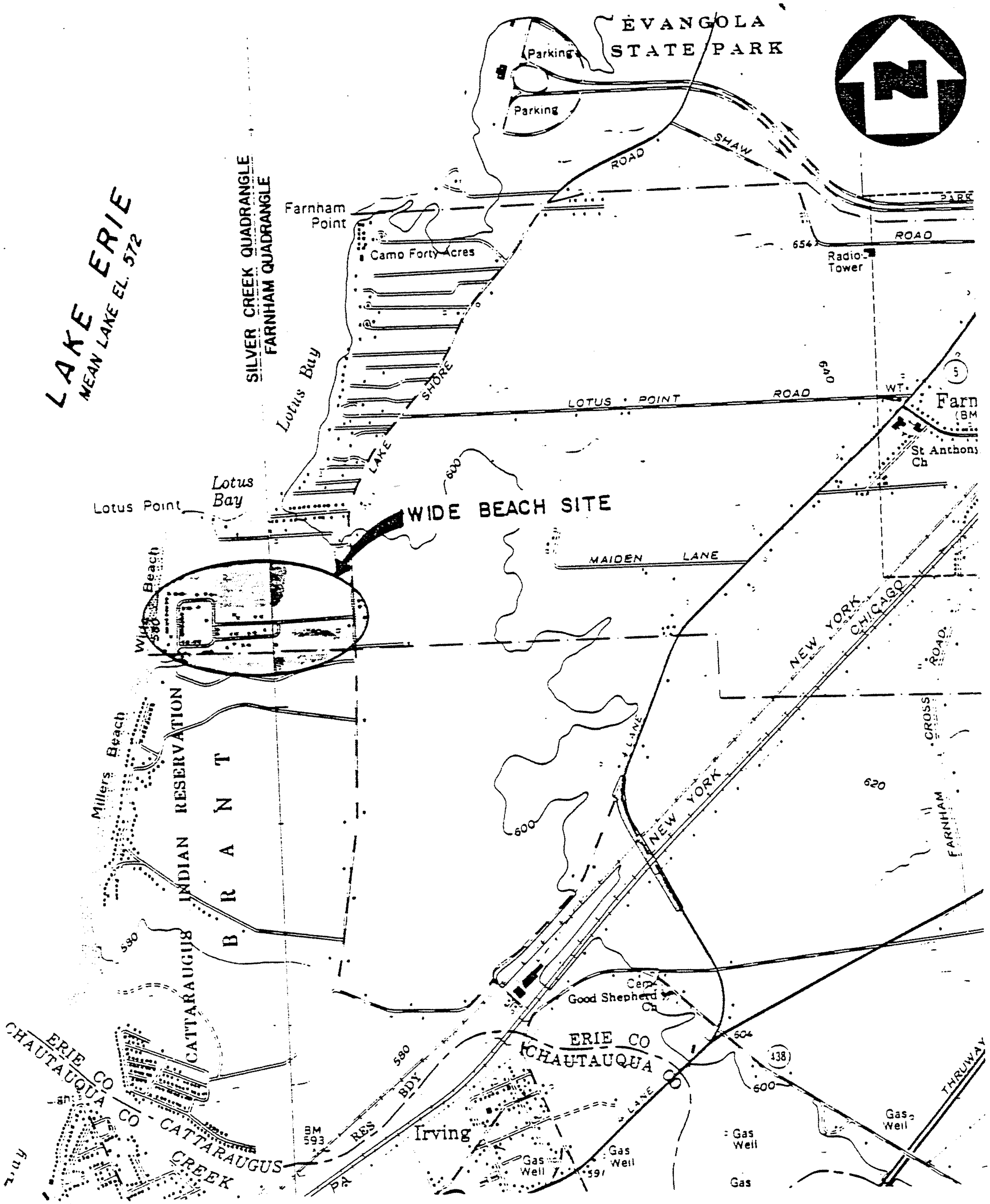
The Wide Beach Development site, incorporated in 1920, is a small lake-side community located in the Town of Brant, in southern Erie County, New York, approximately 48 kilometers (km) south of Buffalo (see Figures 1 and 2). Wide Beach encompasses approximately 22 hectares (ha), 16 of which are developed for residential use; the undeveloped land is largely forest (see Figure 3). The site is bounded on the south by wetlands and the Cattaraugus Indian Reservation, on the west by Lake Erie, and on the east and north by residential and agricultural property.

### °Site Description

Until June-July 1985 when EPA performed a drainage ditch/road paving operation as an immediate removal action (see Site History section of this document), the Wide Beach Development had approximately 1.7 km of unimproved roadways, consisting of gravels and local soils. Grass-lined drainage ditches and a series of catch-basins, culverts, and unnamed watercourses collected and conveyed stormwaters to a 3-ha marsh, draining to Lake Erie. An area called "The Grove," located northeast of "The Oval" (see Figure 2), is community-owned property used for recreation.

### °Population

Sixty residences in the Wide Beach community accommodate approximately 120 people in the summer months. Approximately 45 people reside at Wide Beach year-round. Along the Lake Erie shoreline, west of Lakeshore Road in the site vicinity, population is largely seasonal. North of the site, from Lotus Bay to Evangola State Park, about 1.5 km north of Wide Beach, there are approximately 60 private housing units. The Synder Beach Community, at the southern border of Wide Beach, includes approximately 150 housing units. An Indian reservation community at the



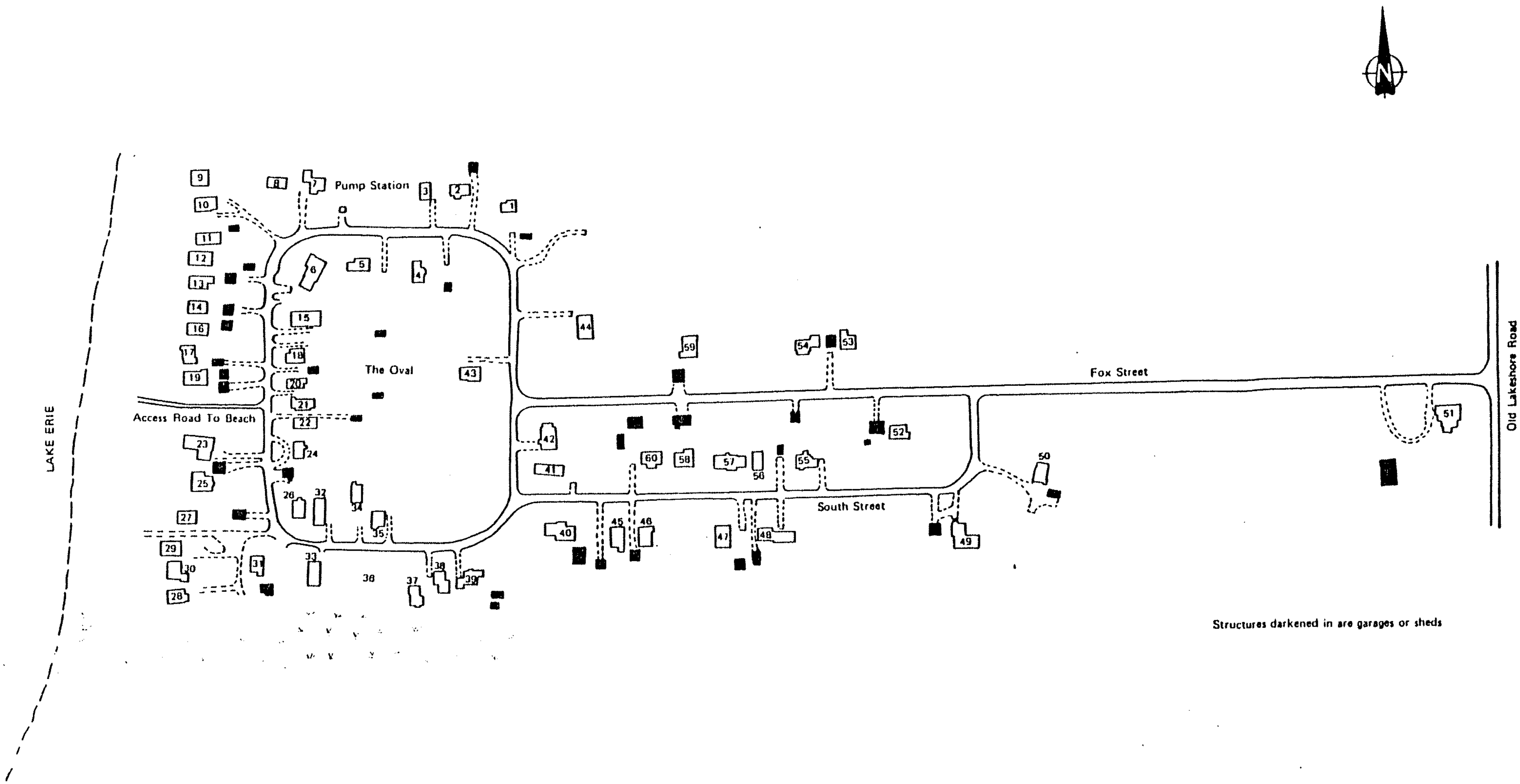

BASE MAP IS A PORTION OF THE U.S.G.S. SILVER CREEK, NY QUADRANGLE AND THE U.S.G.S. FARNHAM, NY QUADRANGLE (BOTH 7.5 MINUTE SERIES, BOTH 1960) CONTOUR INTERVAL 20'

## WIDE BEACH SITE, BRANT TWP., ERIE CO., NY

## SITE LOCATION MAP

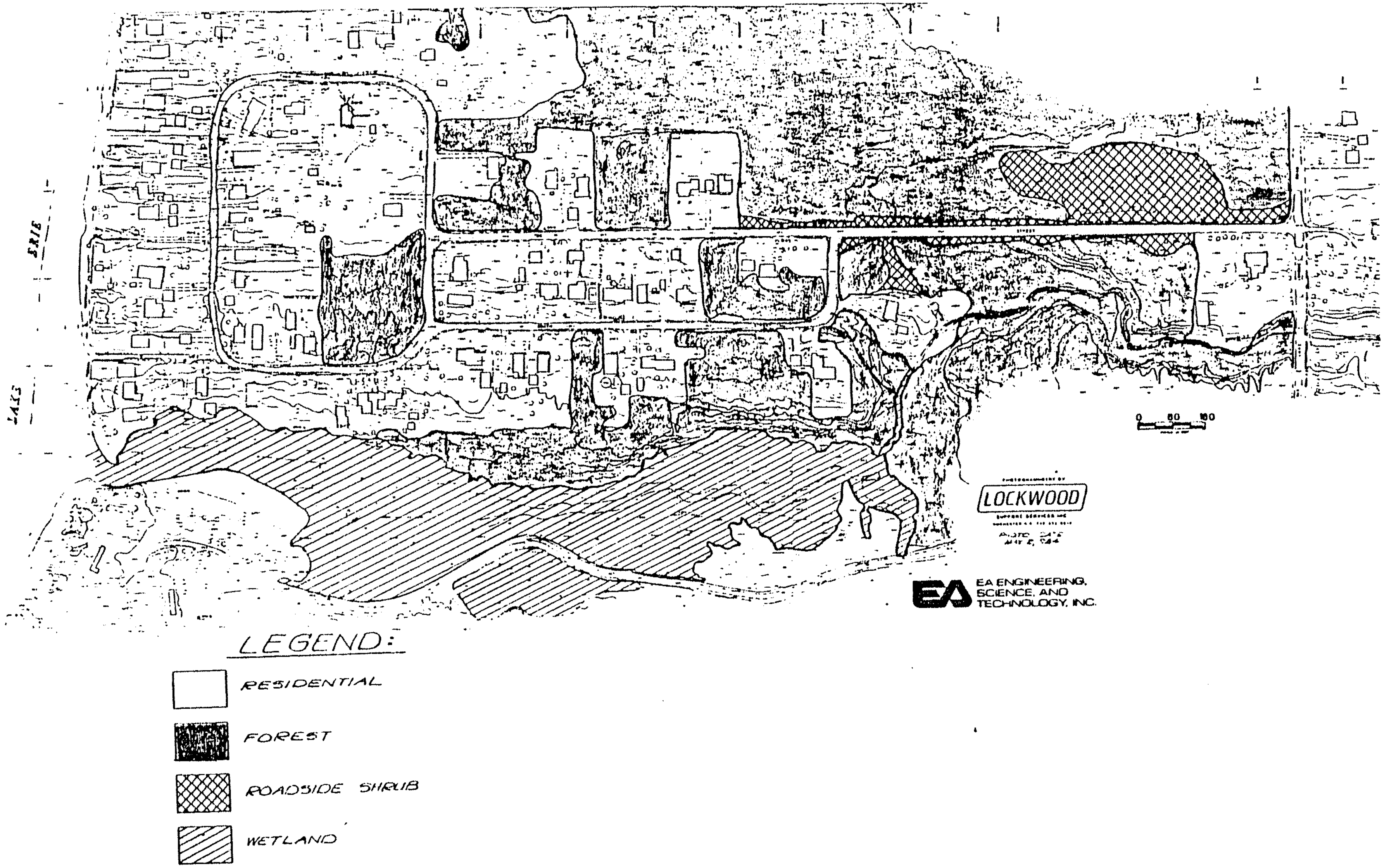
SCALE: 1" = 2000'

Figure 1




**Site Plan**

**Figure 2**




**Land Use**

Figure 3

mouth of Cattaraugus Creek has 50-60 housing units. In addition, there are approximately 14 housing units on both sides of Lake Shore Road, just east and south of the Wide Beach Development. Eleven of these units are on Reservation lands, housing the majority of the 39 residents estimated to be the year-round population of the entire Snyder Beach and vicinity, south of Wide Beach. During the summer season, Snyder Beach is also used by campers.

°Hydrogeology

Wide Beach lies within the Erie-Niagara Basin in the Central Lowlands Physiographic Province, characterized by flat terrain of low relief. The Erie-Niagara Basin is underlain by a series of layered sedimentary rock of Paleozoic Age, striking roughly eastward, and dipping gently to the south. The Paleozic strata, formed of fine-grained sediment deposited in a shallow sea which covered the area during the Silurian and Devonian periods, is overlain by unconsolidated deposits of glacial origin. The till and glacial lake deposits were formed during the Pleistocene Epoch, some 2 million years ago. The low relief of the area is the result of glacial scour and lacustrine deposition. The site itself is virtually flat, gently sloping southward to the wetland bordering the site, and then dropping sharply to the beach.

Weathered bedrock at the site, identified as the West Falls Formation, is described as a black to gray decomposing shale with interbedded light gray siltstone and sandstone. This formation very gently dips in a southerly direction. Throughout the formation, zones of calcareous concretions are found which may also contain some pyrite and marcasite. The bedrock layer, generally only a few centimeters thick at the site, is locally as much as 1 meter (m) thick in the eastern portion of the site.

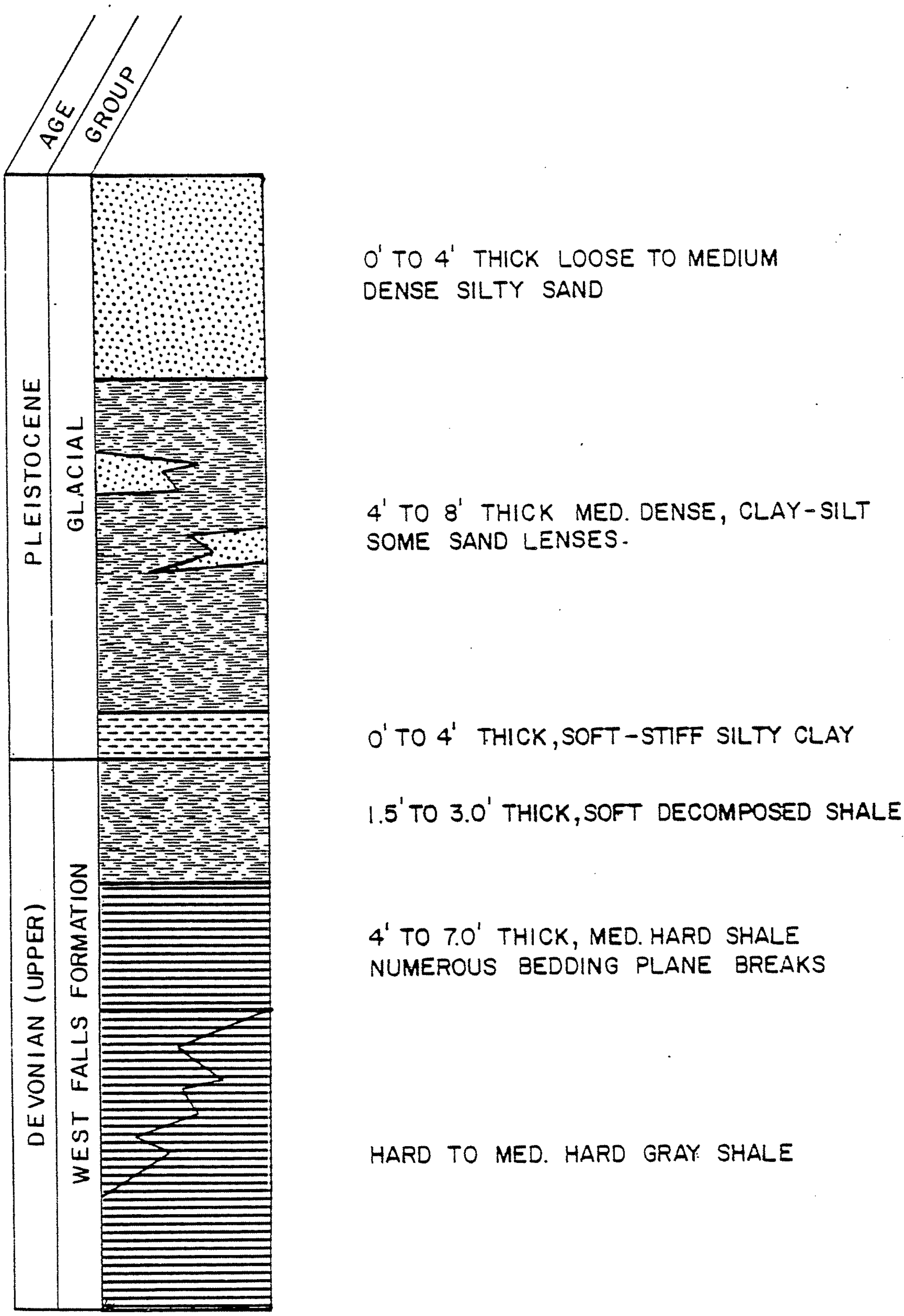
A discontinuous fracture zone found in the upper surface of the bedrock consists of shallow tension cracks caused from the movement of the glacial ice sheet over the rock. Ground-water flows of several liters per minute can flow through these rock joints and fractures.

The overburden at the site, averaging 3 m in thickness, is predominantly till and glacial lake deposits, with the till being composed of dark gray and brown silty clay with some rounded rock fragments. In several soil samples obtained at the site during the remedial investigation, fractures were found with oxidation staining of the surfaces, associated with the percolation of surface water through the overburden to the bedrock.

Near the lake edge and immediately next to the wetland area, the surficial soil is a silty sand 0.6-1.2 m thick. This soil horizon was not found elsewhere on the Wide Beach Development site. In the remaining areas of the development, the surficial 0.15-0.3 m of soil is composed of dark brown silty clay with large amounts of varying grain sizes of sand, and some gravel. Figure 4 shows a generalized stratigraphic cross section.

The surficial soils, underlain by a brown, clayey, fine-grained sand, are found throughout the site, except for locations near the wetlands. The thickness of this layer varies up to 1 m. In some locations, thin lenses of this soil alternate with layers of a brown silty clay. This brown silty clay (till) is the next significant soil horizon, containing some small rounded rock fragments, and with a consistency from stiff to very stiff. A color change in this soil horizon from brown to dark gray is attributed to the weathering of the till in the near-surface layers (EA Engineering). The basal, dark gray till has a higher content of rock fragments than the brown till.

During the Remedial Investigation, a water table was rarely encountered, with saturated split-spoon samples sometimes being found at 0.15-0.3 m above bedrock. This indicates that, at least seasonally, the overlying till acts as a confining layer, imparting on the bedrock aquifer a confined or semi-confined condition. On this basis, the aquifer of concern at the site is the shallow bedrock aquifer, including: the basal 0.3-0.6 m of till, locally where coarser grained; weathered bedrock and the zone of shallow tension cracks; and the upper few meters of open joints and fractures. Field observations, indicate that recharge to the 7-25 m deep on-site private wells occurs predominately through the weathered/fractured zone and open fractures in the shallow bedrock.




WIDE BEACH SITE, BRANT TWP., ERIE CO., NY

GENERALIZED STRATIGRAPHIC COLUMN

NOT TO SCALE

NUS CORPORATION

Figure 4

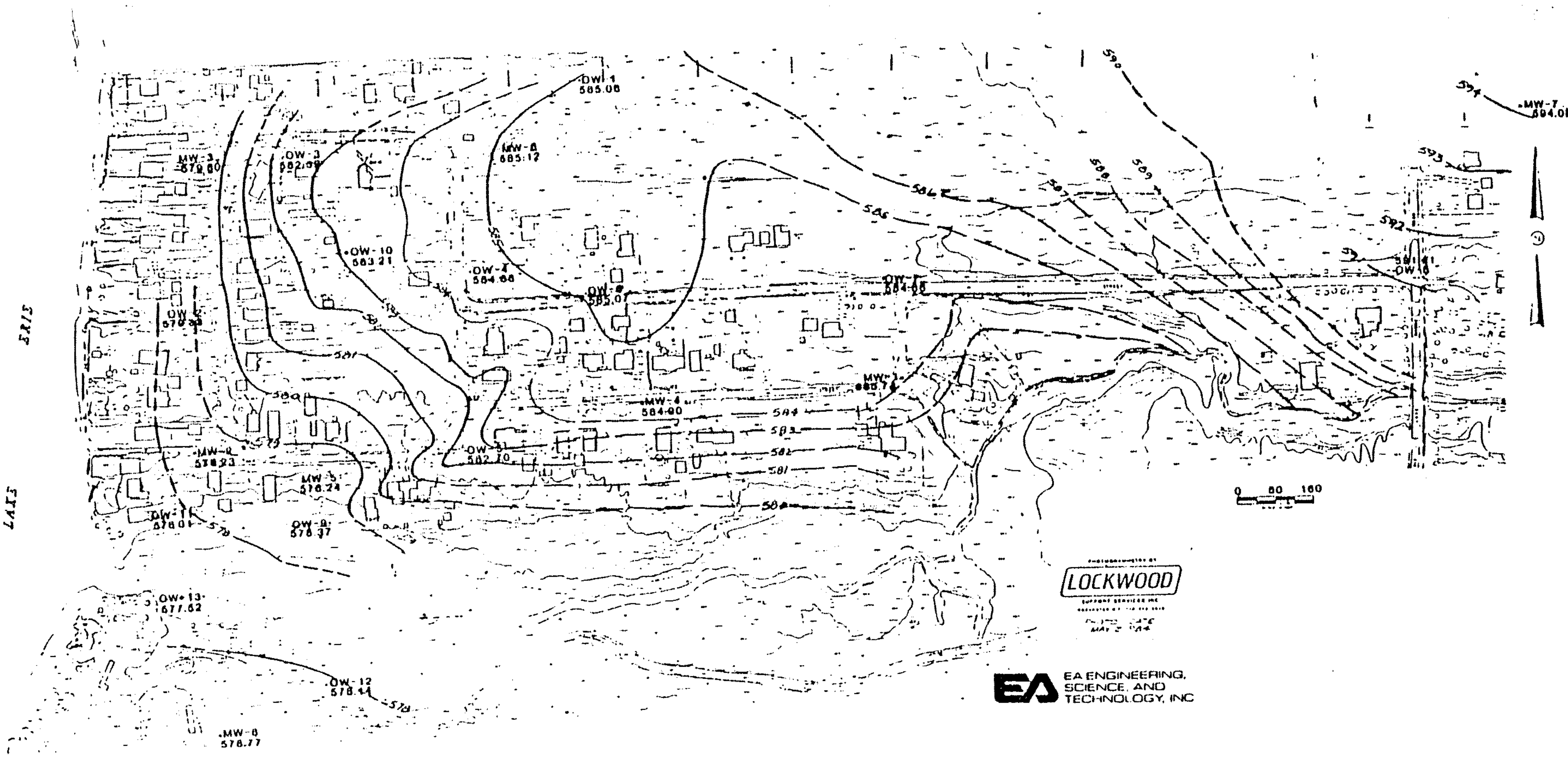
Figure 5 illustrates the potentiometric surface of the shallow bedrock aquifer in December 1984, when water levels were highest with regard to measurements taken during this investigation. An overall average gradient for the site of 0.0009 was estimated on the basis of these contours. The wetlands at the south of the site appear to constitute a ground-water-discharge divide between the site and the land to the south of the wetlands. Based on the December 1984 contours, roughly 80 percent of the site's ground-water discharge is via the stream and wetlands, with the remaining 20 percent being discharged directly to Lake Erie.

## Site History

Between 1968 and 1978, about 155 cubic meters ($m^3$) of waste oil, some of which was contaminated with Polychlorinated Biphenyls (PCBs), was applied by mechanized oil spreader to the local roadways for dust control by the Wide Beach Homeowners Association. Reportedly, about twenty-five drums of oil were used two or three times a year on the approximately 1.7 km of roadway. The source of the waste oil is still being investigaged, however, drums labeled as dielectric coolant were found on-site.

In 1980, the installation of 1.5 km of sanitary sewer line in the community resulted in the excavation of highly contaminated soils from the roadways and their vicinity. Because it was not known at that time that a PCB problem existed, surplus excavated soil was used as fill in several yards and in The Grove.

An Erie County Department of Environment and Planning (ECDEP) investigation of an odor complaint in 1981 located 19 drums in the nearby woods, two of which contained PCB-contaminated waste oil. Subsequent sampling indicated the presence of PCBs in the air, roadway dust, soil, vacuum cleaner dust, and water samples from private wells. Based upon this data, ECDEP recommended closing one well, and advised against planting root crops for human consumption.




## LEGEND

——585—— MEAN SEA LEVEL EL. CONTOUR OF POTENTIOMETRIC SURFACE. DASHED LINE REPRESENTS INFERRED CONTOUR. DATA OBTAINED ON 12/27/84. CONTOUR INTERVAL = 1 FT.

OW = OBSERVATION WELL
MW = MONITORING WELL

Note: The subsurface contours shown represent our evaluation of the most probable conditions based upon interpretation of presently available data. Some variations from these conditions must be expected.

**Potentiometric Contour Map**

Figure 5

Sampling by the Region's Field Investigation Team (FIT) in April 1983 confirmed the presence of PCBs in both the ground water and soils. Testing for dioxin at that time indicated that it was not present. The FIT returned to Wide Beach in mid-November 1983 to sample all of the residential wells, detecting only trace levels of PCBs in several. These concentrations were not deemed an imminent health hazard to the community.

In February 1984, EPA and the State of New York signed a Cooperative Agreement to undertake a Remedial Investigation (RI) and Feasibility Study (FS) at the Wide Beach Development site.

In April 1985, EA Engineering, Science and Technology, the State's contractor, completed the RI report.

In June-July 1985, in response to the levels of PCB contamination found in the homes during the RI, EPA performed an immediate removal action to protect the public until the implementation of a long-term remedial measure. This action included: (1) paving* of the roadways, drainage areas, and driveways to prevent further exposure of the public via the dust and runoff routes; (2) decontamination of the homes by rug shampooing, vacuuming, and replacement of air conditioner and furnace filters; and (3) protection of the individual private wells from sporadic incidents of PCB contamination by the installation of particulate filters.

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* It should be noted that it has been estimated that the asphaltic paving of the roadways may only last 2-4 years. In order to have constructed a more permanent roadway, excavation, so as to allow the installation of an adequate subbase, would have been required. However, since the roadways are contaminated, the excavated materials would have had to been disposed of in compliance with TSCA, magnifying the cost, considerably (by approximately $2 million).

In August 1985, EA completed a draft FS which was subsequently released for public review and comments. The Community Relations section of this Record of Decision (ROD) provides specific details associated with the public review period.

To date, Potentially Responsible Parties have been identified, and have been sent notice and information-request letters at the initiation of the RI/FS and notice letters before proceeding with the immediate removal action.

## Current Site Status

PCBs, specifically Aroclor 1254, have been found over the majority of the Wide Beach Development site in all environmental media, with the major reservoir being the roadway and drainage ditch soils. Surface water runoff and infiltration, as well as the wind and pedestrian and vehicular traffic, have transported the PCB-contaminated soils over much of the site.

### °Soils

With regard to the soils, PCB contamination was found in all but one of the 53 unpaved driveway samples, ranging from 0.18 to 390 milligrams/kilogram (mg/kg); in all but one yard and open lot samples, ranging from <0.05 to 600 mg/kg; in all roadway samples, ranging from 1.0 to 226 mg/kg, and in all drainage ditch samples, ranging from 0.2 to 1026 mg/kg. In one catch basin sample, 5300 mg/kg PCB was found. The depth to which PCBs were found in the soils at concentrations exceeding 10 mg/kg range from approximately 0.15 m in the yards, to approximately 1 m in the drainage ditches adjacent to the contaminated roadways. Contamination was found to an approximate depth of 0.5 m in the roadways, 0.3 m in the driveways, and 0.2 m in the wetlands. Tables 1-7 summarize the findings of the soil sampling investigations in the driveways, yards, open lots, roadways and drainage ditches.

Figure 6 summarizes each occurrence of PCB-contaminated soil or dust at concentrations greater than 50 mg/kg at the site. This analysis indicates PCB concentrations greater than 50 mg/kg in the area of The Oval, north and south outside of The Oval, and adjacent to the roadways. The eastern portion of The Oval showed the largest cluster of high PCB concentrations.

RESULTS OF PCB ANALYSIS ON SOIL SAMPLES COLLECTED FROM DRIVEWAYS AT WIDE BEACH, NEW YORK AUG 84

| Station No. | Name of Resident | Aroclor 1254 (mg/kg) |
|---|---|---|
| 1 | Helmich | 58 |
| 2 | Morgante | 25 |
| 3 | Kalenda | 180 |
| 4 | Horth | 110 |
| 5 | Franz | 89 |
| 6 | Militello | 11 |
| 7 | Miller | 120 |
| 8 | Allen | 390 |
| 9 | Barton | 16 |
| 10 | Plewak | 16 |
| 11 | Hickey | 24 |
| 12 | Schultz | 11 |
| 13 | Holmes | NS(a) |
| 14 | Major | 54 |
| 15 | Militello | 390 |
| 16 | Taylor | NS(a) |
| 17 | Perhach | 82 |
| 18 | Grey | 50 |
| 19 | Mason | 2.4 |
| 20 | Gillig | 170 |
| 21 | Hockman | 230 |
| 22 | Winnert | 41 |
| 23 | Aurelio/Mach | ND |
| 24 | Shanahan | 0.18 |
| 25 | Lundberg | NS(a) |
| 26 | Murphy | 12 |
| 27 | Oehler | 2.8 |
| 28 | Prince | 0.40 |
| 29 | Ball | 13 |
| 30 | Miller | 6.1 |
| 31 | Lojacono | 130 |
| 32 | Gajewski | 26 |
| 33 | Murphy | 190 |
| 34 | Murphy | 84 |
| 35 | Plewak | 17 |
| 37 | Pronobis | 370 |
| 38 | Guerra | 87 |
| 39 | Meyer | 18 |
| 40 | Rusch | NS(a) |
| 41 | Hellman | 64 |
| 42 | Grabenstatter | 26 |
| 43 | Franz | 55 |
| 44 | Roe | 9.9 |
| 45 | Mueller | 12 |
| 46 | Bauer | 30 |
| 47 | Rogers | 43.0 |
| 48 | Burke | 8.4 |
| 49 | Speck | 4.6 |
| 50 | Hansen | 11 |
| 51 | Lyford | 70 |
| 52 | Murphy | 6.8 |
| 53 | Newman | 12 |
| 54 | Nosbisch | NS(a) |
| 55 | Zender | 72 |
| 56 | Persichini | 23 |
| 57 | Militello | NS(a) |
| 58 | Egner | 48 |
| 59 | Canteline | 10 |
| 60 | Bowen | 63 |

(a) Not sampled because driveway is paved.

Table 1

RESULTS OF PCB DETERMINATIONS ON SOIL SAMPLES COLLECTED FROM YARDS, WIDE BEACH, NEW YORK, AUGUST 1984

| Station No. | Name of Resident | Aroclor 1254 (mg/kg) |
|---|---|---|
| 1 | Helmich | 48 |
| 2 | Morgante | 23 |
| 3 | Kalenda | 18 |
| 4 | Horth | 3.4 |
| 5 | Franz | 2.8 |
| 6 | Militello | 6.0 |
| 7 | Miller | 7.0 |
| 8 | Allen | 5.2 |
| 9 | Barton | 39 |
| 10 | Plewak | 2.6 |
| 11 | Hickey | 1.4 |
| 12 | Schultz | 4.9 |
| 13 | Holmes | 14 |
| 14 | Major | 3.0 |
| 15 | Militello | 100 |
| 16 | Taylor | 1.5 |
| 17 | Perhach | 25 |
| 18 | Grey | 6.1 |
| 19 | Mason | 1.7 |
| 20 | Gillig | 13 |
| 21 | Hockman | 16 |
| 22 | Winnert | 14 |
| 23 | Aurelio/Mach | 21 |
| 24 | Shanahan | 1.1 |
| 25 | Lundberg | 42 |
| 26 | Murphy | 11 |
| 27 | Oehler | 3.5 |
| 28 | Prince | 0.05 |
| 29 | Ball | 0.06 |
| 30 | Miller | 1.8 |
| 31 | Lojacono | 46 |
| 32 | Gajewski | 230 |
| 33 | Murphy | 120 |
| 34 | Murphy | 1.1 |
| 35 | Plewak | 12 |
| 36A | Pronobis[(a)] | 91 |
| 36B | Pronobis[(b)] | 0.64 |
| 37 | Pronobis | 33 |
| 38 | Guerra | 600 |
| 39 | Meyer | 9.6 |
| 40 | Rusch | 6.4 |
| 41 | Hellman | 65 |
| 42 | Grabenstatter | 9.0 |
| 43 | Franz | 57 |
| 44 | Roe | 20 |
| 45 | Mueller | 1.9 |
| 46 | Bauer | 5.7 |
| 47 | Rogers | 2.7 |
| 48 | Burke | 3.0 |
| 49 | Speck | 13 |
| 50 | Hansen | 1.8 |
| 51 | Lyford | 9.3 |
| 52 | Murphy | 7.7 |
| 53 | Newman | 2.1 |
| 54 | Nosbisch | 8.8 |
| 55 | Zender | 1.3 |
| 56 | Persichini | 6.3 |
| 57 | Militello | 11 |
| 58 | Egner | 3.7 |
| 59 | Canteline | 5.8 |
| 60 | Bowen | 1.1 |

(a) Sample collected in field next to Pronobis residence roadway.
(b) Sample collected in field next to Pronobis residence 65 ft from roadway.

Table 2

SUMMARY OF RESULTS OF PCB DETERMINATIONS FOR SOIL SAMPLES COLLECTED FROM YARDS AND OPEN LOTS IN WIDE BEACH, NEW YORK, MAY 1982

| Station Location | Collection Date | Sample Depth(a) | Source(b) | Aroclor 1254 (mg/kg) |
|---|---|---|---|---|
| Morgante, 29 Oval | 19 MAY 82 | SU | Yard-F | 30.5 |
| | | D | | 0.4 |
| Horth, 38 Oval - E. of house | 19 MAY 82 | SU | Yard-S | 7.5 |
| | | D | | 1.5 |
| Militello, 60 Oval | 19 MAY 82 | SU | Yard-S | 110.6 |
| | | D | | 3.6 |
| Miller, 50 Oval | 19 MAY 82 | SU | Yard-F | 12.4 |
| | | D | | 0.8 |
| Perhach, 81 Oval | 19 MAY 82 | SU | Yard-F | 25.8 |
| | | D | | 1.8 |
| Grey, 82 Oval | 19 MAY 82 | SU | Yard-F | 6.4 |
| | | D | | 1.8 |
| Hockman, 90 Oval | 20 MAY 82 | SU | Yard-F | 2.2 |
| | | D | | <0.05 |
| Hockman, 90 Oval | 20 MAY 82 | SU | Yard-B | 1.4 |
| | | D | | 2.0 |
| Murphy, 124 Oval | 20 MAY 82 | SU | Yard-F | 46.8 |
| | | D | | 3.7 |
| Vacant Lot | 20 MAY 82 | SU | Lot | 77.5 |
| | | D | | 32.5 |
| Meyers, 141 Oval | 20 MAY 82 | SU | Yard-F | 7.1 |
| | | D | | 1.2 |
| Rusch, 3 South St. | 18 MAY 82 | SU | Yard-B | 0.14 |
| | | D | | <0.05 |
| Grabenstatter, 1 Oval | 18 MAY 82 | SU | Yard-F | 2.6 |
| Grabenstatter, 1 Oval | 18 MAY 82 | SU | Yard-B | 0.4 |
| | | D | | <0.05 |

(a) Surficial samples (SU) taken at 0-6 in.; deep sample (D) taken at 3-ft depth.
(b) B = back, F = front, S = side.

Table 3

| Station Location | Collection Date | Sample Depth[a] | Source[b] | Aroclor 1254 (mg/kg) |
|---|---|---|---|---|
| Franz, 6 Oval | 19 MAY 82 | SU | Yard-B | 0.5 |
| | | D | | <0.05 |
| Rogers, 17 South St. | 18 MAY 82 | SU | Yard-F | 10.2 |
| | | D | | 2.8 |
| Burke, 21 South St. | 18 MAY 82 | SU | Yard-B | <0.05 |
| | | D | | 0.9 |
| Hansen, 43 South St. | 18 MAY 82 | SU | Yard-F | 5.0 |
| | | D | | 14.0 |
| Hansen, 43 South St. | 18 MAY 82 | SU | Yard-B | 1.8 |
| | | D | | 0.4 |
| Lyford, 10870 Lakeshore Rd. | 19 MAY 82 | SU | Yard-F | 20.5 |
| | | D | | 12.0 |
| Newman, 30 Fox St. | 18 MAY 82 | SU | Yard-F | 12.0 |
| | | D | | 3.6 |
| Newman, 30 Fox St. | 18 MAY 82 | SU | Yard-B | 0.9 |
| | | D | | ND |
| Zender, 26 South St. | 18 MAY 82 | SU | Yard-B | 0.2 |
| | | D | | <0.05 |
| Militello, 20 South St. | 18 MAY 82 | SU | Yard-F | 3.4 |
| | | D | | 1.8 |
| Wooded Area | 18 MAY 82 | SU | Soil | 3.6 |
| | | D | | 0.5 |
| Lot West | 18 MAY 82 | SU | Soil | 8.1 |
| | | D | | 8.1 |
| Vacant Lot | 18 MAY 82 | SU | Soil | 23.0 |
| | | D | | 2.8 |
| Wooded Area | 20 MAY 82 | SU | Soil | 56.0 |
| | | D | | 1.45 |
| Lot across road | 20 MAY 82 | SU | Soil | 28.6 |
| | | D | | 18.2 |
| Not Stated | 19 MAY 82 | SU | Fill Dirt | 11.8 |
| | | D(1´) | | 11.2 |
| Lot across Fox Rd. | 19 MAY 82 | SU | Soil | 37.0 |
| | | D | | 1.1 |

Table 3

Continued

SUMMARY OF PCB DETERMINATIONS CONDUCTED ON SOIL SAMPLES COLLECTED FROM ROADWAYS OF WIDE BEACH AND ERIE COUNTY, NEW YORK, APRIL 1983

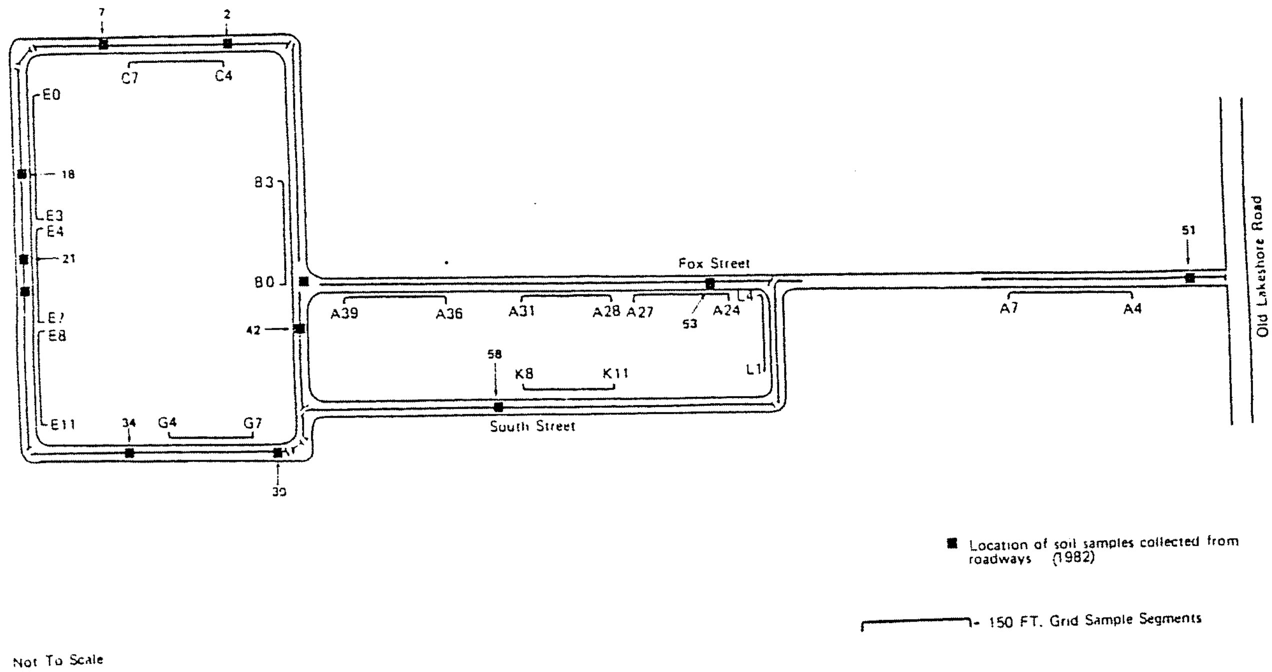
| Sample Number | Location | Aroclor 1254 (mg/kg) |
|---|---|---|
| 1 | $A_{28-31}$ Center 0-6 in. | 4.61 |
| 2 | $A_{28-31}$ South 0-6 in. | 9.07 |
| 3 | $A_{28-31}$ North 0-6 in. | 29.34 |
| 4 | $L_{01-04}$ Center 0-6 in. | 5.20 |
| 5 | $L_{01-04}$ West 0-6 in. | 7.41 |
| 6 | $L_{01-04}$ East 0-6 in. | 11.97 |
| 7 | $E_{04-07}$ Center 3-6 in. | 4.53 |
| 8 | $E_{04-07}$ Center 6-12 in. | 5.48 |
| 9 | $E_{04-07}$ Center 0-3 in. | 5.23 |
| 10 | $E_{04-07}$ East 0-3 in. | 7.42 |
| 11 | $E_{04-07}$ East 3-6 in. | 59.44 |
| 12 | $E_{04-07}$ East 6-12 in. | 12.15 |
| 13 | $E_{04-07}$ West 0-3 in. | 6.02 |
| 14 | $E_{04-07}$ West 6-12 in. | 9.42 |
| 15 | $E_{04-07}$ West 3-6 in. | 38.91 |
| 16 | $A_{36-39}$ North 0-3 in. | 53.79 |
| 17 | $A_{36-39}$ North 3-6 in. | 17.89 |
| 18 | $A_{36-39}$ South 0-3 in. | 26.27 |
| 19 | $A_{36-39}$ South 3-6 in. | 1.62 |
| 20 | $A_{36-39}$ Center 0-3 in. | 30.37 |
| 21 | $A_{36-39}$ Center 3-6 in. | 26.37 |
| 22 | $B_{00-03}$ West 0-3 in. | 118.09 |
| 23 | $B_{00-03}$ Center 0-3 in. | 24.15 |
| 24 | $B_{00-03}$ East 0-3 in. | 16.19 |
| 25 | $G_{04-07}$ Center 0-3 in. | 12.53 |
| 26 | $G_{04-07}$ South 0-3 in. | 119.18 |
| 27 | $G_{04-07}$ North 0-3 in. | 4.52 |
| 28 | $B_{00-03}$ East 3-6 in. | 18.65 |
| 29 | $G_{04-07}$ Center 3-6 in. | 11.01 |
| 30 | $B_{00-03}$ Center 3-6 in. | 26.32 |
| 31 | $E_{08-11}$ East 3-6 in. | 22.61 |

Table 4

| Sample Number | Location | Aroclor 1254 (mg/kg) |
|---|---|---|
| 32 | $G_{04-07}$ South 3-6 in. | 107.52 |
| 33 | $E_{08-11}$ Center 3-6 in. | 2.94 |
| 34 | $A_{04-07}$ North 3-6 in. | 17.96 |
| 35 | $A_{04-07}$ North 0-3 in. | 6.87 |
| 36 | $A_{04-07}$ Center 0-3 in. | 11.34 |
| 37 | $A_{04-07}$ South 0-3 in. | 8.19 |
| 38 | $A_{04-07}$ Center 3-6 in. | 4.97 |
| 39 | $K_{08-11}$ North 3-6 in. | 41.05 |
| 40 | $C_{04-07}$ North 0-3 in. | 3.48 |
| 41 | $E_{08-11}$ East 0-3 in. | 2.40 |
| 42 | $E_{08-11}$ West 3-6 in. | 40.13 |
| 43 | Picnic Grove | 3.80 |
| 44 | $K_{08-11}$ Center 0-3 in. | 46.54 |
| 45 | Hansen's Yard | 3.73 |
| 46 | $A_{24-27}$ Center 0-6 in. | 5.44 |
| 47 | $E_{08-11}$ East 0-3 in. | 69.92 |
| 48 | $C_{04-07}$ Center 3-6 in. | 36.36 |
| 49 | $K_{08-11}$ Center 3-6 in. | 2.31 |
| 50 | $K_{08-11}$ South 0-3 in. | 77.00 |
| 51 | $E_{08-11}$ Center 0-3 in. | 9.85 |
| 52 | $K_{08-11}$ South 3-6 in. | 7.96 |
| 53 | $C_{04-07}$ South 3-6 in. | 58.80 |
| 54 | $A_{24-27}$ South 0-6 in. | 57.54 |
| 55 | $C_{04-07}$ North 3-6 in. | 226.00 |
| 56 | $A_{24-27}$ North 0-6 in. | 31.10 |
| 57 | $C_{04-07}$ South 0-3 in. | 42.24 |
| 58 | $K_{08-11}$ North 0-3 in. | 8.09 |
| 59 | $C_{04-07}$ Center 0-3 in. | 39.16 |
| 60 | $A_{04-07}$ South 3-6 in. | 1.57 |
| 61 | $G_{04-07}$ North 3-6 in. | 15.71 |
| 62 | $B_{00-03}$ West 3-6 in. | 59.40 |
| 63 | $E_{00-03}$ East 6-12 in. | 23.09 |

Table 4
Continued

| Sample Number | Location | Aroclor 1254 (mg/kg) |
|---|---|---|
| 64 | $E_{00-03}$ East 3-6 in. | 12.37 |
| 65 | $E_{00-03}$ East 0-3 in. | 7.92 |
| 66 | $E_{00-03}$ West 6-12 in. | 4.75 |
| 67 | $E_{00-03}$ West 3-6 in. | 10.14 |
| 68 | $E_{00-03}$ West 0-3 in. | 1.74 |
| 69 | $E_{00-03}$ Center 6-12 in. | 114.48 |
| 70 | $E_{00-03}$ Center 3-6 in. | 123.05 |
| 71 | $E_{00-03}$ Center 0-3 in. | 85.59 |




Location Map

Table 4

Continued

SUMMARY OF PCB DETERMINATIONS FOR SOIL SAMPLES COLLECTED FROM ROADWAYS IN WIDE BEACH COMMUNITY

| Station/Location | Collection Date | Sample Type | Sample Depth[a] | Source | Aroclor 1254 (mg/kg) |
|---|---|---|---|---|---|
| Morgante, 29 Oval | 19 MAY 82 | Soil | Surface | Road | 60.5 |
| Miller, 50 Oval | 19 MAY 82 | Soil | Surface | Road | 6.0 |
| Grey, 82 Oval | 19 MAY 82 | Soil | Surface | Road | 71.5 |
| Hockman, 90 Oval | 20 MAY 82 | Soil | Surface | Road | 51.0 |
| Murphy, 124 Oval | 20 MAY 82 | Soil | Surface | Road | 8.0 |
| Meyers, 141 Oval | 20 MAY 82 | Soil | Surface | Road | 2.37 |
| Grabenstatter, 1 Oval | 18 MAY 82 | Soil | Surface | Road | 153.6 |
| Lyford, 10870 Lakeshore Rd. | 19 MAY 82 | Soil | Surface | Road | 99.3 |
| Newman, 30 Fox St. | 18 MAY 82 | Soil | Surface | Road | 78.3 |
| Egner, South St. | 18 MAY 82 | Soil | Surface | Road side | 115.6 |
| | | | Deep | | 19.8 |
| Intersection of Oval and Fox St. | 18 MAY 82 | Soil | Surface | Road | 44.4 |
| Intersection of Oval and Access Rd. | 20 MAY 82 | Soil | Surface | Road | 23.2 |
| | | | Deep | | 1.0 |

(a) Surficial samples taken at 0-6 in.; deep samples taken at 3 ft.

Table 5

## SUMMARY OF RESULTS OF PCB DETERMINATIONS ON SOIL SAMPLES COLLECTED FROM DRAINAGE DITCHES AT WIDE BEACH, ERIE COUNTY, NEW YORK, 1981 AND 1982

| Station Location | Collection Date | Sample Type | Sample Depth[a] | Source[b] | Aroclor 1254 (mg/kg) |
|---|---|---|---|---|---|
| Hockman, 90 Oval | 1 OCT 81 | Soil | SU | Ditch | 91.9 |
| Grey, 82 Oval | 19 NOV 81 | Soil | SU | Ditch | 1,026 |
| | | | D | | 158 |
| Winnert, Oval | 19 NOV 81 | Soil | SU | Ditch | 162 |
| | | | D | | 8 |
| Plewak, 128 Oval | 19 NOV 81 | Soil | SU | Ditch | 7.9 |
| | | | D | | 217.5 |
| Grabenstatter, 1 Oval | 19 NOV 81 | Soil | SU | Ditch | 28 |
| | | | D | | 46.4 |
| Newman, 30 Fox St. | 19 NOV 81 | Soil | SU | Ditch | 25 |
| | | | D | | 22.5 |
| Bowen, 9 South St. | 19 NOV 81 | Soil | SU | Ditch | 179 |
| | | | D | | 125 |
| Bowen, Backyard on Fox St. | 19 NOV 81 | Soil | SU | Ditch | 2.0 |
| | | | D | | 4.67 |
| SE Corner of Fox & South St. | 19 NOV 81 | Soil | SU | Ditch | 25.5 |
| | | | D | | 5.0 |

(a) Surficial samples (SU) taken at 0-6 in.; deep samples (D) taken at 3 ft.
(b) Samples taken at drainage ditches located in front of residences.
(c) Sample taken at waste-oil barrel storage area.

| Station Location | Collection Date | Sample Type | Sample Depth[(a)] | Source[(b)] | Concentration (mg/kg) |
|---|---|---|---|---|---|
| West side of Oval, NE corner | 19 NOV 81 | Soil | SU<br>D | Ditch | 67.5<br>340 |
| Genrack Estate | 19 NOV 81 | Soil | SU<br>D | Ditch | 0.04<br>0.05 |
| Grey, 82 Oval | MAR 82 | Soil | SU | Ditch | 121 |
| Militello, 60 Oval | 19 MAY 82 | Soil | SU<br>D | Ditch | 205.9<br>59.1 |
| Miller, 50 Oval | 19 MAY 82 | Soil | SU<br>D | Ditch | 4.4<br>1.6 |
| Hockman, 90 Oval | 20 MAY 82 | Soil | SU<br>D | Ditch | 236.9<br>56.0 |
| Plewak, 128 Oval | 20 MAY 82 | Soil | SU<br>D | Ditch | 0.3<br>0.2 |
| Hellman, 2 South St. | 18 MAY 82 | Soil | SU<br>D | Ditch | 79.0<br>2.2 |
| Ditch on south side of Fox Rd. | 18 MAY 82 | Soil | SU<br>D | Ditch | 114<br>1.4 |
| Ditch north side of Fox Rd. | 18 MAY 82 | Soil | Su<br>D | Ditch[(c)] | 487<br>18.4 |

Table 6
Continued

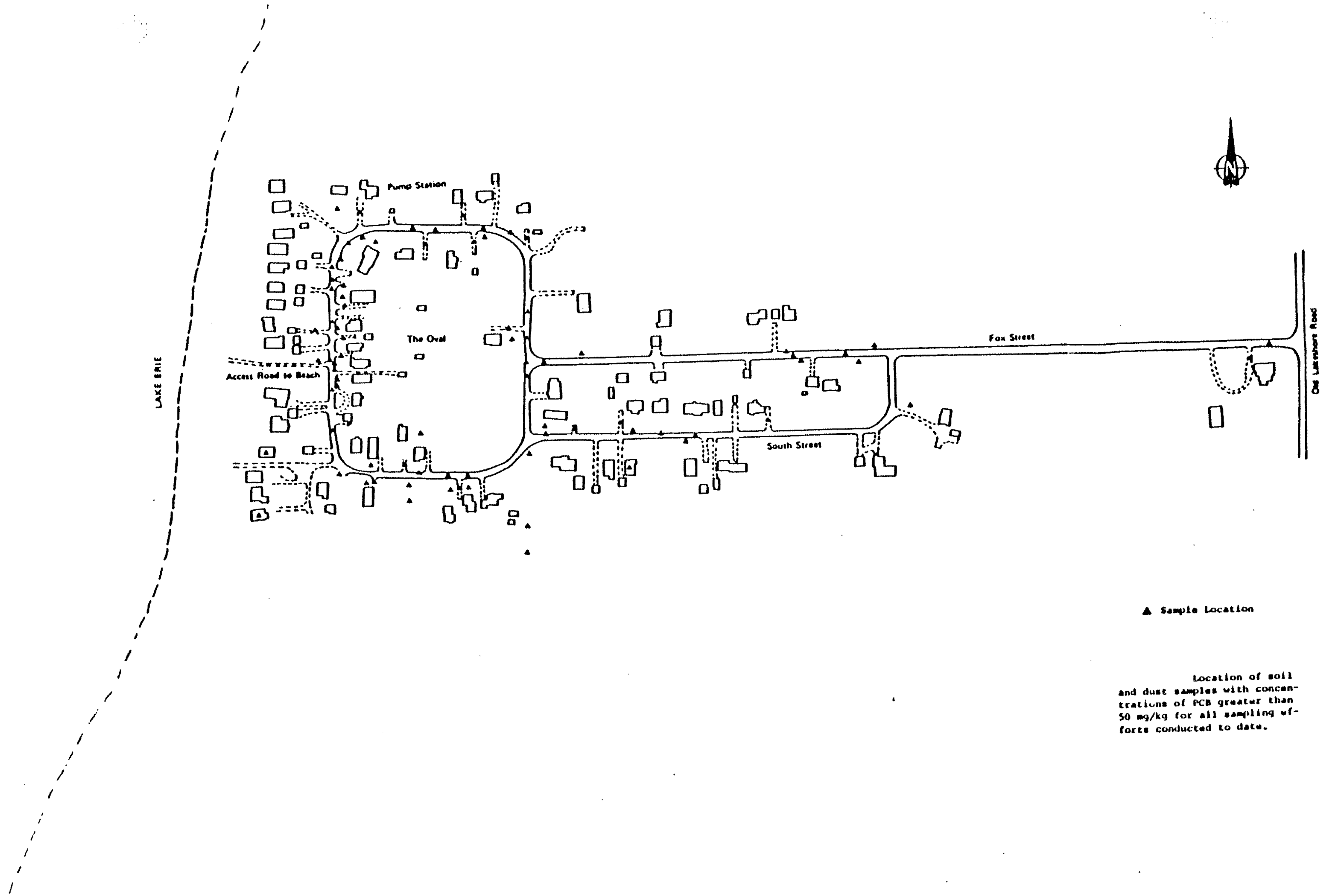
## SUMMARY OF PCB DETERMINATIONS IN SOIL SAMPLES (SPLIT SPOON AND BORINGS) COLLECTED AT WIDE BEACH, TOWN OF BRANT, ERIE COUNTY, NEW YORK, SEPTEMBER 1984

| Station Number | Station Location | Collection Date | Sample Type | Aroclor 1254 (mg/kg) |
|---|---|---|---|---|
| OW-1 | Surficial (1-4 in.) | 4 SEP 84 | Soil | 18 |
| OW-2 | Surficial (1-4 in.) | 5 SEP 84 | Soil | 670 |
| OW-3 | Surficial (1-4 in.) | 6 SEP 84 | Soil | 1.5 |
| OW-4 | Surficial (1-4 in.) | 6 SEP 84 | Soil | 99 |
| OW-5 | Surficial (1-4 in.) | 7 SEP 84 | Soil | 0.45 |
| OW-6 | Surficial (1-4 in.) | 10 SEP 84 | Soil | 17 |
| OW-7 | Surficial (1-4 in.) | 12 SEP 84 | Soil | 100 |
| OW-8 | Surficial | 11 SEP 84 | Soil | 22 |
| OW-9 | Surficial (0-4 in.) | 13 SEP 84 | Soil | 0.90 |
| OW-10 | Surficial (0-4 in.) | 17 SEP 84 | Soil | 5.7 |
| OW-11 | Surficial (0-4 in.) | 17 SEP 84 | Soil | 6.7 |
| OW-12 | Surficial (0-6 in.) | 29 NOV 84 | Soil | 0.027 |
| OW-13 | Surficial (0-6 in.) | 29 NOV 84 | Soil | 0.019 |
| | Catch Basin 3 | 8 SEP 84 | Soil | 190 |
| | Catch Basin 6 | 8 SEP 84 | Soil | 5,300 |
| | Catch Basin 7 | 8 SEP 84 | Soil | 370 |
| | Catch Basin 8 | 12 SEP 84 | Soil | 64 |
| | Catch Basin 12 | 8 SEP 84 | Soil | 120 |
| | Surficial Outfall 1 | 12 SEP 84 | Soil | 220 |
| | Surficial Outfall 2 | 12 SEP 84 | Soil | 120 |
| | Open Lot 1 (1 ft) | 12 SEP 84 | Soil | 34 |
| | Open Lot 1 (2 ft) | 12 SEP 84 | Soil | 33 |
| | Open Lot 2 (1 ft) | 12 SEP 84 | Soil | 5.5 |
| | Open Lot 2 (2 ft) | 12 SEP 84 | Soil | 9.1 |
| | Open Lot 3 (1 ft) | 9 SEP 84 | Soil | 16 |
| | Open Lot 4 (1 ft) | 12 SEP 84 | Soil | 98 |
| | Open Lot 4 (2 ft) | 12 SEP 84 | Soil | 1.2 |
| | Open Lot 4 (3 ft) | 12 SEP 84 | Soil | 1.4 |
| | Open Lot 4 (4 ft) | 12 SEP 84 | Soil | 0.04 |
| MW-1 | Surficial (0-4 in.) | 13 SEP 84 | Soil | 13 |
| MW-2 | Surficial (0-4 in.) | 17 SEP 84 | Soil | 10 |
| MW-3 | Surficial (0-4 in.) | 24 SEP 84 | Soil | 15 |

Table 7

| Station Number | Station Location | Collection Date | Sample Type | Aroclor 1254 (mg/kg) |
|---|---|---|---|---|
| MW-4 | Surficial (0-4 in.) | 24 SEP 84 | Soil | 110 |
| MW-5 | Surficial (0-6 in.) | 24 SEP 84 | Soil | 0.71 |
| MW-5 | Sample 4 (8.0-8.5 ft) | 24 SEP 84 | Soil | ND |
| MW-6 | Sample 5 (10.5-11.0 ft) | 25 SEP 84 | Soil | ND |
| MW-6 | Surficial (0-6 in.) | 25 SEP 84 | Soil | 12 |
| MW-7 | Surficial (0-6 in.) | 26 SEP 84 | Soil | 0.03 |
| MW-8 | Surficial (0-6 in.) | 29 NOV 84 | Soil | 0.014 |
| SW-1 | Surficial (0-4 in.) | 18 SEP 84 | Soil | 120 |
| SW-2 | Surficial (0-4 in.) | 18 SEP 84 | Soil | 13 |
| SW-3 | Surficial (0-4 in.) | 19 SEP 84 | Soil | 0.88 |
| SW-4 | Surficial (0-4 in.) | 19 SEP 84 | Soil | 20 |
| SW-5 | Surficial (0-4 in.) | 27 SEP 84 | Soil | 34 |
| SW-6 | Surficial (0-4 in.) | 24 SEP 84 | Soil | 180 |
| B-1 | Surficial (0-6 in.) | 12 SEP 84 | Soil | 0.13 |
| B-1 | Sample 9 (7.5-8.0 ft) | 12 SEP 84 | Soil | 0.015 |
| B-1 | Sample 10 (9.0-9.5 ft) | 12 SEP 84 | Soil | 0.12 |
| B-2 | Surficial (0-2 in.) | 12 SEP 84 | Soil | 190 |
| B-2 | Sample 4 (7.5-8.0 ft) | 12 SEP 84 | Soil | 0.008 |
| B-2 | Sample 5 (9.5-10.0 ft) | 12 SEP 84 | Soil | 0.005 |
| B-3 | Surficial (0-6 in.) | 12 SEP 84 | Soil | 48 |
| B-3 | Sample 5 (7.5-8.0 ft) | 12 SEP 84 | Soil | 0.008 |
| B-3 | Sample 6 (9.5-10.0 ft) | 12 SEP 84 | Soil | 0.21 |
| B-4 | Surficial (0-6 in.) | 13 SEP 84 | Soil | 240 |
| B-4 | Sample 4 (7.0-7.5 ft) | 13 SEP 84 | Soil | 0.011 |
| B-4 | Sample 5 (8.0-8.5 ft) | 13 SEP 84 | Soil | 0.009 |
| B-5 | Surficial (0-6 in.) | 24 SEP 84 | Soil | 47 |
| B-5 | Sample 5 (9.0-9.5 ft) | 24 SEP 84 | Soil | 0.14 |
| B-6 | Surficial (0-6 in.) | 27 SEP 84 | Soil | 28 |
| B-6 | Sample 5 (9.5-10.0 ft) | 27 SEP 84 | Soil | 0.04 |
| | Field Blank | 12 SEP 84 | Soil | ND |
| | Field Blank | | | ND |
| | Field Blank | | | ND |

Table 7
Continued




On-Site Soil Samples Location Map

Figure 6

Several soil areas in the northeastern portion of the site have very high PCB concentrations (>500 mg/kg), however, these samples do not reveal a particular pattern.

°Surface Water

Until the covering of the roadways and drainage areas in the summer of 1985, surface water was the primary transport mechanism off-site. The PCBs present in stormwater runoff from the site appeared to be primarily associated with the particulate fraction in the runoff. The variation in PCB distribution in the runoff over time indicated erosion, with the highest concentrations appearing at the storm event onset. Surface-water erosion was most likely responsible for the majority of the contaminant redistribution observed on-site. High PCB concentrations observed in the wetlands area to the south have presumably resulted from stormwater runoff, with the wetland marsh acting as a sediment trap. The deposited sediment, thus constitutes at least a temporary reservoir for the transported PCBs. PCBs may be released from this reservoir by re-equilibration with water or by resuspension of the sediment during a storm event. The ultimate sink for waterborne-PCBs is Lake Erie. This whole process in the wetland would vary seasonally owing to the intermittent nature of discharge to Lake Erie through the wetland/stream outlet.

Sediment cores taken from the marsh area located at the southern end of Wide Beach (see Table 8) indicate PCB concentrations ranging from nondetectable to 126 mg/kg. Generally, PCB levels were higher in the top sections of sediment cores with the only significant concentrations being found in the immediate vicinity of the storm drain outfalls.

The PCB loading to the stream/wetland system, and to Lake Erie, prior to the road paving was established based on estimated runoff volumes and PCB concentrations. Since the concentrations reported for the outfalls in Table 9 would be typical of runoff, PCB concentrations in runoff were calculated to be 19.34 and 0.86 microgram/liter (ug/1) for the particulate and dissolved fraction, respectively, with a total value of 20.20 ug/1. With a total site area of 22 ha, drainage to the stream/wetland system was estimated to be 19 ha. Additionally, 1.5 ha appear to drain off-site to the north.

SUMMARY OF RESULTS OF PCB DETERMINATIONS ON MARSH SEDIMENT CORES
COLLECTED AT WIDE BEACH SITE, ERIE COUNTY, NEW YORK

| Number | Station Location | Collection Date | Overall Core Length (in.) | Segment Length (in.) | Segment Designation | Aroclor 1254 (mg/kg) |
|---|---|---|---|---|---|---|
| C1 | Wide Beach Wetland | 30 AUG 84 | 4.25 | 4.25 | All | 0.08 |
| C2 | Wide Beach Wetland | 30 AUG 84 | 2.87 | 2.87 | All | 0.02 |
| C3 | Wide Beach Wetland | 30 AUG 84 | 14.0 | 7.0 | Top | 0.07 |
| C3 | Wide Beach Wetland | 30 AUG 84 | | 7.0 | Bottom | 0.13 |
| C4 | Wide Beach Wetland | 30 AUG 84 | 18.75 | 6.25 | Top | 0.17 |
| C4 | Wide Beach Wetland | 30 AUG 84 | | 6.25 | Middle | ND |
| C4 | Wide Beach Wetland | 30 AUG 84 | | 6.25 | Bottom | ND |
| C5 | Wide Beach Wetland | 30 AUG 84 | 17.37 | 5.87 | Top | 2.4 |
| C5 | Wide Beach Wetland | 30 AUG 84 | | 5.87 | Bottom | 0.02 |
| C5 | Wide Beach Wetland | 30 AUG 84 | | 5.87 | Middle | 0.01 |
| C6 | Wide Beach Wetland | 30 AUG 84 | 13.87 | 6.94 | Top | 70 |
| C6 | Wide Beach Wetland | 30 AUG 84 | | 6.94 | Bottom | 1.8 |
| C7 | Wide Beach Wetland | 30 AUG 84 | 14.12 | 7.06 | Top | 3.7 |
| C7 | Wide Beach Wetland | 30 AUG 84 | | 7.06 | Bottom | 0.01 |
| C8 | Wide Beach Wetland | 30 AUG 84 | 10.75 | 4.37 | Top | 13 |
| C8 | Wide Beach Wetland | 30 AUG 84 | | 4.37 | Bottom | 0.70 |
| C9 | Wide Beach Wetland | 30 AUG 84 | 10.87 | 5.44 | Top | 1.4 |
| C9 | Wide Beach Wetland | 30 AUG 84 | | 5.44 | Bottom | 0.12 |
| C10 | Wide Beach Wetland | 30 AUG 84 | 11.37 | 5.69 | Top | 6.4 |
| C10 | Wide Beach Wetland | 30 AUG 84 | | 5.69 | Bottom | 0.40 |
| C11 | Wide Beach Wetland | 30 AUG 84 | 6.75 | 6.75 | All | 200 |
| C12 | Wide Beach Wetland | 30 AUG 84 | 9.63 | 4.81 | Top | 5.5 |
| C12 | Wide Beach Wetland | 30 AUG 84 | | 4.81 | Bottom | 0.09 |
| C13 | Wide Beach Wetland | 30 AUG 84 | 14.63 | 7.31 | Top | 2.2 |
| C13 | Wide Beach Wetland | 30 AUG 84 | | 7.31 | Bottom | 0.02 |

Table 8

SUMMARY OF RESULTS OF TOTAL AND DISSOLVED PCB AROCLOR 1254 DETERMINATIONS ON STORM-WATER SAMPLES COLLECTED 30 AUGUST 1984, WIDE BEACH, NEW YORK

| Station | Collection Time | Dissolved Aroclor 1254 (ug/l) | Total Aroclor 1254 (ug/l) |
|---|---|---|---|
| Outfall 1 | 1135 | 0.92 | 93 |
| Outfall 1 | 1205 | 0.46 | 8.0 |
| Outfall 1 | 1235 | 0.47 | 6.4 |
| Outfall 1 | 1335 | 0.78 | 5.2 |
| Outfall 1 | 1435 | 1.0 | 4.0 |
| Outfall 1 | 1530 | 1.4 | 4.6 |
| | | | |
| Marsh 1 | 1215 | 0.08 | 0.28 |
| Marsh 1 | 1315 | 0.30 | 2.9 |
| Marsh 1 | 1415 | ND | 0.26 |
| Marsh 1 | 1515 | 0.04 | 0.20 |
| | | | |
| Catch Basin 1 | 1215 | 0.51 | 14 |
| Catch Basin 1 | 1315 | 0.95 | 13 |
| Catch Basin 1 | 1415 | 1.4 | 11 |
| Catch Basin 1 | 1515 | 1.5 | 11 |

Table 9

In a worst case scenario, assuming that all of the storm runoff, estimated at 62 centimeters/year (cm/yr), is surface flow, the average surface water flow was estimated to be $7.2 \times 10^6$ and $8.5 \times 10^7$ liters/year to the lake and stream/marsh, respectively, representing a maximum potential loading of 0.14 and 1.7 kg of PCBs to the lake and stream/marsh systems, respectively. Assuming that the total PCBs discharged to the stream/marsh will reach Lake Erie, a loading of 1.8 kg/yr to Lake Erie would be expected via stormwater runoff. An estimated 0.13 kg/yr of PCBs would be transported off-site to the north in storm runoff.

°Ground water

Ground-water data indicate that one of eight monitoring wells, and all six sewer trench wells were contaminated with Aroclor 1254 (see Tables 10 and 11). Based on the drinking water sampling studies, twenty-one of sixty residential wells have been contaminated at some point in time (see Table 12). Levels of Aroclor 1254 in residential wells, however, are both low and sporadic in occurrence. The sewer trench well samples had the highest values of all ground-water samples.

The surficial soils from the sewer trench wells are also contaminated, although there is no correlation between levels in the soil and those in the wells.

PCB contamination of the ground water may have occured either by PCB leaching from the surficial soils via infiltration, or by migration from disturbed soil where contaminated surficial soils have been buried at deeper levels. This may have occured during the sewer installation or excavation activities associated with gas and other pipeline repair.

## SUMMARY OF PRIORITY POLLUTANT COMPOUNDS DETERMINED IN AQUEOUS SAMPLES COLLECTED FROM MONITORING WELLS LOCATED IN THE VICINITY OF THE TOWN OF BRANT, ERIE COUNTY, NEW YORK

| Compound | Unit | MW-1 | MW-2 | MW-3 | MW-4 | MW-5 | MW-6 | MW-7 | MW-8 |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Alpha BHC | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Beta BHC | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Lindane | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlordane | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| 4,4'-DDD | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| 4,4'-DDE | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Dieldrin | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan I | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan Sulfate | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Endrin | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Endrin Aldehyde | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor Epoxide | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Methoxychlor | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| Toxaphene | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| PCB 1016 | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| PCB 1221 | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| PCB 1232 | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| PCB 1248 | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |
| PCB 1254 | ug/l | ND | ND | 0.2 | ND | ND | ND | ND | ND |
| PCB 1260 | ug/l | ND | ND | ND | ND | ND | ND | ND | ND |

---

ND = Not detected at established detection limits.

Table 10

SUMMARY OF PCB CONCENTRATIONS DETERMINED IN AQUEOUS SAMPLES COLLECTED FROM SEWER TRENCH WELLS, WIDE BEACH, TOWN OF BRANT, NEW YORK

| Station Location | PCB 1016 (ug/l) | 1221 (ug/l) | 1232 (ug/l) | 1242 (ug/l) | 1248 (ug/l) | 1254 (ug/l) | 1260 (ug/l) |
|---|---|---|---|---|---|---|---|
| SW-1 | ND | ND | ND | ND | ND | 2.5 | ND |
| SW-2 | ND | ND | ND | ND | ND | 4.3 | ND |
| SW-3 | ND | ND | ND | ND | ND | 1.4 | ND |
| SW-4 | ND | ND | ND | ND | ND | 2.6 | ND |
| SW-5 | ND | ND | ND | ND | ND | 5.7 | ND |
| SW-6 | ND | ND | ND | ND | ND | 1.5 | ND |

Table 11

## SUMMARY OF ALL SAMPLING EFFORTS CONDUCTED TO DETERMINE PCB CONCENTRATIONS (ug/l) IN RESIDENTIAL WELL WATER

| Name of Resident | Station No. | Erie County Dept. of Environment & Planning | | | | | | EPA Region II FIT Sampling | | EA Engineering |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 SEP 81 | 17 SEP 81 | 1 OCT 81 | 19 MAY 82 | 21 JUL 82 | 15 SEP 82 | 6 APR 83 | 8-11 NOV 83 | AUG 84 |
| Helmich | 1 | 0.66 | 0.50 | ND | 0.06 | ND | ND | | ND | ND |
| Morgante | 2 | | | | ND | ND | ND | | ND | ND |
| Kalenda | 3 | | | | ND | -- | 0.12 | | | -- |
| Horth | 4 | | | | 0.06 | ND | ND | | | ND |
| Franz | 5 | | | | ND | ND | ND | | ND | ND |
| Militello | 6 | | | | ND | ND | 0.10 | | Beach well:ND Drilled well:ND(a) | 0.06 |
| Miller | 7 | | | | ND | ND | ND | ND | ND | -- |
| Allen | 8 | | | | 0.07 | ND | ND | | | ND |
| Barton | 9 | | | | ND | ND | -- | | | -- |
| Plewak | 10 | 0.65 | ND | ND | ND | 0.16 | ND | 0.63 | ND | ND |
| Hickey | 11 | | | | ND | 0.10 | 0.08 | | | 0.16 |
| Shultz | 12 | | | | ND | ND | 0.16 | | | |
| Holmes | 13 | | | | | | | | ND | -- |
| Major | 14 | | | | -- | ND | ND | | ND | ND |
| Militello | 15 | | | | -- | ND | -- | | ND | ND |
| Taylor | 16 | | | | -- | ND | ND | | ND | -- |
| Perhach | 17 | | | | | | | | ND | ND |
| Grey | 18 | | | | ND | ND | ND | | | ND |
| Mason | 19 | | | | ND | ND | ND | | ND(a) | ND |
| Gillig | 20 | | | | ND | ND | ND | | ND | ND |
| Hockman | 21 | 4.56 | 0.69 | ND | ND | ND | ND | 0.75/ND | ND | ND |
| Winnert | 22 | | | | | | | | | -- |
| Aurelio | 23 | | | | ND | -- | -- | | ND | ND |
| Shanahan | 24 | | | | ND | ND | ND | | ND | ND |
| Lundberg | 25 | | | | ND | ND | ND | | ND | ND |

(a) No PCBs were detected in pre- or post-treated water samples.
(b) Water sample collected post-filtered.

Table 12

| Name of Resident | Station No. | Erie County Dept. of Environment & Planning 3 SEP 81 | 17 SEP 81 | 1 OCT 81 | 19 MAY 82 | 21 JUL 82 | 15 SEP 82 | EPA Region II FIT Sampling 6 APR 83 | 8-11 NOV 83 | EA Engineering AUG 84 |
|---|---|---|---|---|---|---|---|---|---|---|
| Murphy | 26 | | | | | | | | | ND |
| Oehler | 27 | | | | ND | 0.08 | ND | | | |
| Prince | 28 | | | | ND | ND | ND | | ND | ND |
| Ball | 29 | | | | | | | | ND | -- |
| Miller | 30 | | | | | | | | | ND |
| Lajacono | 31 | ND | ND | ND | ND | ND | ND | | ND(a) | 0.06 |
| Gajewski | 32 | | | | -- | 0.80 | -- | | ND | ND |
| Murphy | 33 | | | | ND | ND | ND | | | -- |
| Murphy | 34 | | | | ND | ND | ND | | ND | ND |
| Plewak | 35 | | | | ND | ND | ND | | | ND |
| Pronobis | 37 | ND | ND | ND | ND | ND | ND | | | ND |
| Guerra | 38 | | | | ND | ND | -- | | 2.0 | ND |
| Meyer | 39 | | | | ND | ND | ND | | | ND |
| Rusch | 40 | | | | | | | | ND | ND |
| Fein | 41 | | | | ND | ND | ND | | ND | ND |
| Grabbenstatter | 42 | | | | ND | 0.06 | ND | | ND(a) | ND |
| Franz | 43 | | | | | | | | | -- |
| Roe | 44 | | | | ND | ND | ND | | ND | ND |
| Mueller | 45 | | | | 0.06 | ND | ND | | ND(a) | ND |
| Bauer | 46 | | | | | | | | ND | ND |
| Rogers | 47 | | | | ND | ND | ND | ND | | ND |
| Burke | 48 | | | | ND | ND | ND | | ND | 0.06 |
| Speck | 49 | | | | 0.1 | ND | 0.11 | | ND | 0.12 |
| Hansen | 50 | ND | 0.20 | ND | ND | 0.14 | ND | | ND | ND |
| Lyford | 51 | | | | ND | ND | 0.06 | | ND | ND |
| Murphy | 52 | | | | | | | | ND | ND |
| Newman | 53 | | | | ND | ND | ND | | ND | ND |
| Nosbisch | 54 | 1.32 | 0.21 | ND | | | | ND | ND | -- |
| Zender | 55 | | | | ND | ND | ND | | ND | ND |
| Persichini | 56 | | | | ND | ND | ND | | | -- |
| Militello | 57 | | | | ND | ND | ND | ND(b) | | ND |
| Egner | 58 | | | | | | | | | -- |
| Canteline | 59 | | | | | | | ND(a) | | ND |
| Bowen | 60 | ND | ND | ND | ND | 0.05 | ND | ND | | ND |

Table 12

Continued

Following application of the PCB-contaminated oil to the ground surface, it is believed that the PCBs migrated through the unsaturated zone toward the water table. Initially, this movement may have been in the bulk oil phase, however, as PCBs move into the soil, they become tightly bound to the soil particles. This generally appears to have happened within the top 18 cm of soil at the Wide Beach site. Further migration of the PCBs probably occurred via solubization in water infiltrating through the vadose zone. The factors controlling solubilization typically are the soil organic carbon - water partition coefficient ($4.25 \times 10^4$ for Aroclor 1254) and the soil organic content (approximately 1.3 percent at Wide Beach).

As water moves through the soils, PCB are adsorbed and desorbed by organic matter, resulting in a slowing or retardation of the PCB movement. The PCB concentrations in the ground water associated with soils can be estimated by calculating the equilibrium state of a soil/water mixture from soil PCB concentrations, the partition coefficient, the soil organic content, and the soil/water content. Using typical and high soil PCB concentrations of 50 and 500 ug/1, respectively, the resulting ground-water concentration of PCBs can be expected to be from 3.2 to 32 ug/1 at equilibrium. Although it is very difficult to fix a precise value to the PCB migration rate through the unsaturated soils on-site, it is possible to draw the following conclusions:

1. PCBs have migrated downward through the vadose zone.

2. The surficial soils will act as a long-term (possibly thousands of years) source of PCBs.

3. Migration via this route may have resulted in low level ground-water contamination in the saturated zone.

4. The potential exists for more significant ground-water contamination via this route in the future.

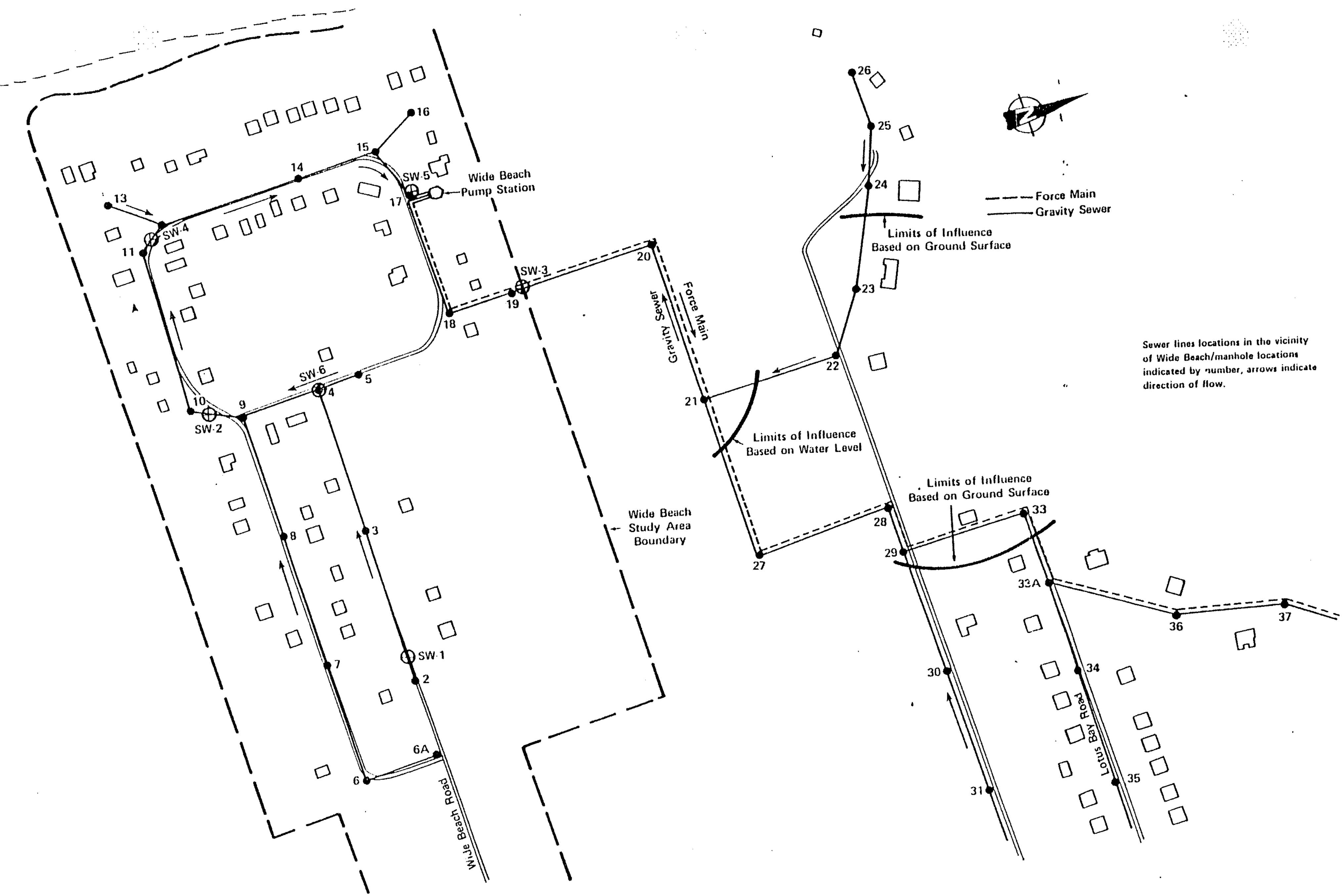
Installation of the sewer system in 1980 resulted in backfilling of the sewer trench excavation with PCB-contaminated soils removed from the surface of the trenches. As a result, another potential transport mechanism may be these sewer system trenches. The sewer trench construction includes a bedding material of Number 1 stone, without any flow blockage. The low specific surface area and organic carbon content of the backfill will result in relatively little retardation of PCB transport.

Therefore, the sewer trenches represent a potential conduit for rapid PCB transport, either into the bedrock or off-site to Lotus Point to the north. The results of ground-water analysis of samples from the sewer trench wells (refer to Table 11) confirm the presence of PCBs, and reinforce the theory of high transport potential in the sewer trench. This theory is further substantiated by the relatively high level of PCBs found in monitoring well SW-3 (1.4 ug/1) (see Figure 7), situated approximately 43 m north of The Oval in an area of low surficial PCB contamination (0.88 mg/kg). The PCBs found in the SW-3 water sample probably migrated through the bedding from a point near the road.

Migration of PCBs to saturated ground water is possible through other pathways, as well. Since high levels of PCBs have been detected in house dust, it is possible that PCB-contaminated soils and other materials may have been disposed of in the now inactive septic systems through general house cleaning, as well as laundering and bathing, allowing transport to the ground water via the septic leach field. Also, many drinking water wells may not be properly grouted, potentially resulting in a rapid conduit from the surface for surface water carrying PCB-contaminated soil particles. Compared to the other more obvious transport pathways, migration via these pathways is difficult to quantify.

Saturated zone contaminant migration is primarily in a horizontal direction, with retardation of PCB movement in the saturated overburden being the same as in the unsaturated zone. In the fractured bedrock, however, transport is far less likely to be retarded, due to lower surface area and organic matter available for adsorption. In bedrock, the PCB velocity is highly dependent on the nature of the fracturing. It is conceivable that in some fractures, water velocities in the meter per day range are possible, and little if any PCB retardation is occurring. Under such a condition, transport of PCBs would be quite rapid.

With the exception of the potential for some movement to the north through the sewer trench bedding, migration of ground water from the Wide Beach Development site appears unlikely. Based on estimates of area of ground-water drainage from the site into Lake Erie and the stream/wetland system (4 and 19 ha, respectively), an average annual ground-water discharge of 4 million liters directly to Lake Erie and to the stream/wetland system can be calculated. Assuming an average PCB concentration of 50 mg/kg across the site, the ultimate maximum PCB ground-water discharge would be approximately 0.014 and 0.059 kg/yr to Lake Erie and stream/wetland, respectively, for a total of 0.073 kg/yr.




sewer trench

Sample Location Map

Figure 7

°Dust and Air

Vacuum cleaner dust samples from forty-seven of the sixty residences showed PCB levels ranging from 0.25 to 770 mg/kg (see Table 13). Ambient air particulate samples indicated PCB levels ranging from 0.040 to 0.307 $mg/m^3$. Table 14 lists total suspended particulate levels, which reflect the quantity of roadway dust particles in the atmosphere that could be PCB-contaminated.

Based on the ambient dust measurements and meteorological conditions, the concentrations of airborne PCBs, both in the vapor and sorbed phase, were modeled for conditions prior to the roadway paving activities. For a worst case scenario, the on-site concentration was 0.29 $ug/m^3$, and the concentration at Lotus Point was $6.3 \times 10^{-3}$ $ug/m^3$. For an average case scenario, the concentration on-site was $4.6 \times 10^{-3}$ $ug/m^3$; at Lotus Point, $1.7 \times 10^{-3}$ $ug/m^3$. Because the road surfaces are now paved, the ambient dust concentrations would be significantly less.

Based upon a review of the data, no apparent PCB distribution pattern was observed at this site. Linear correlation analysis for vacuum cleaner dust, yard soil, driveway soil, and roadway soils revealed no statistically significant associations.

°Biota

Live-trapping of small mammals was conducted at three on-site and two off-site locations to collect liver tissue for PCB determinations. Table 15 summarizes PCB Aroclor 1254 concentrations in mammal liver tissue and percent lipids. PCB values were normalized for percent lipids. Normalized values ranged from 6.7 to 69.6 mg/kg for on-site samples.

°PCB Chemistry

PCBs are not subject to hydrolysis, oxidation, or thermal degradation at environmentally significant rates (EPA 1980; Callahan 1979), leaving photolysis and biodegradation as the only chemical routes for decay. Most PCB congeners will undergo photolysis to some extent, but the rate of this process is very slow. Considering the fact that sorbed PCBs may not be available for absorption of solar energy, photolysis will probably not be important at Wide Beach. Additionally, photolysis does not result in complete degradation of the PCB molecule and reaction products may be more toxic than PCBs themselves.

SUMMARY OF RESULTS OF PCB DETERMINATIONS ON VACUUM DUST SAMPLES COLLECTED FROM RESIDENCES, WIDE BEACH, NEW YORK,

| Station Number | Residence | Aroclor 1254 (mg/kg) 1982 | Aroclor 1254 (mg/kg) 1984 |
|---|---|---|---|
| 1 | Helmich | | 22 |
| 2 | Morgante | | 35 |
| 3 | Kalenda | | (a) |
| 4 | Horth | | 24 |
| 5 | Franz | | (a) |
| 6 | Militello | | 20 |
| 7 | Miller | | 6.0 |
| 8 | Allen | | 21 |
| 9 | Barton | | (a) |
| 10 | Plewak | | 3.3 |
| 11 | Hickey | | (a) |
| 12 | Schultz | | 3.6 |
| 13 | Holmes | | (a) |
| 14 | Major | | 4.0 |
| 15 | Militello | | 0.87 |
| 16 | Taylor | | (a) |
| 17 | Perhach | | 0.60 |
| 18 | Grey | | 6.4 |
| 19 | Mason | | 3.4 |
| 20 | Gillig | 41.0 | 3.5 |
| 21 | Hockman | | 4.0 |
| 22 | Winnert | | (a) |
| 23 | Aurelio | | 2.0 |
| 24 | Shanahan | | 2.2 |
| 25 | Lundberg | | 25 |
| 26 | Murphy | | 1.6 |
| 27 | Oehler | | 460 |
| 28 | Prince | | 770 |
| 29 | Ball | | (a) |
| 30 | Miller | | (a) |
| 31 | Lojacono | | 1.6 |
| 32 | Gajewski | | 5.8 |
| 32 | Gajewski | | 3.5(b) |
| 33 | Murphy | | 18 |
| 34 | Murphy | | 26 |
| 35 | Plewak | | 2.0 |
| 37 | Pronobis | | 43 |
| 38 | Guerra | | (a) |
| 39 | Meyer | | 4.3 |
| 40 | Rusch | | 4.6 |
| 41 | Hellman | | 6.0 |
| 42 | Grabbenstatter | | 0.25 |
| 43 | Franz | | (a) |
| 44 | Roe | | 3.5 |
| 45 | Mueller | | 1.3 |
| 46 | Bauer | | 150 |
| 47 | Rogers | | 9.0 |
| 48 | Burke | | 31 |
| 49 | Speck | | 20 |
| 50 | Hansen | 36.0 | 2.5 |
| 51 | Lyford | 4.0 | 4.7 |
| 52 | Murphy | | 2.8 |
| 53 | Newman | | 0.68 |
| 54 | Nosbisch | | 8.4 |
| 55 | Zender | | 3.5 |
| 56 | Persichini | | (a) |
| 57 | Militello | | 8.2 |
| 58 | Egner | | (a) |
| 59 | Canteline | | 1.9 |
| 60 | Bowen | | 9.3 |

(a) Sample was not collected.
(b) Sample was collected from an enclosed porch floor.

Table 13

SUMMARY OF RESULTS OF TOTAL SUSPENDED PARTICULATE COLLECTED
AT WIDE BEACH, NEW YORK, AUGUST 1984

| Date | Unit | Station 1 (Field Office) | Station 2 (Plewak) | Station 3 (Prince) | Station 4 (Rush) | Station 5 (Grabbenstatter) |
|---|---|---|---|---|---|---|
| 31 AUG 84 | $mg/m^3$ | 0.107 | 0.182 | 0.307 | 0.100 | 0.175 |
| 1 SEP 84 | $mg/m^3$ | -- | 0.216 | 0.099 | 0.090 | 0.132 |
| 2 SEP 84 | $mg/m^3$ | 0.116 | 0.254 | 0.125 | 0.128 | 0.135 |
| 3 SEP 84 | $mg/m^3$ | 0.057 | 0.107 | 0.056 | 0.056 | 0.060 |
| 3 SEP 84 | $mg/m^3$ | 0.050 | 0.117 | 0.064 | 0.040 | 0.104 |
| 5 SEP 84 | $mg/m^3$ | 0.075 | 0.108 | 0.061 | 0.056 | 0.165 |
| 6 SEP 84 | $mg/m^3$ | 0.085 | 0.147 | 0.046 | 0.041 | 0.110 |
| 7 SEP 84 | $mg/m^3$ | 0.128 | 0.301 | 0.121 | 0.102 | 0.145 |
| 8 SEP 84 | $mg/m^3$ | 0.153 | 0.453 | 0.127 | 0.125 | 0.187 |
| 9 SEP 84 | $mg/m^3$ | 0.111 | 0.247 | 0.092 | 0.091 | 0.117 |
| 10 SEP 84 | $mg/m^3$ | 0.103 | 0.211 | 0.093 | 0.093 | 0.096 |
| 11 SEP 84 | $mg/m^3$ | 0.045 | 0.086 | 0.047 | 0.044 | 0.044 |
| 12 SEP 84 | $mg/m^3$ | 0.085 | 0.198 | 0.089 | 0.079 | 0.102 |
| 13 SEP 84 | $mg/m^3$ | 0.073 | 0.149 | 0.071 | 0.067 | 0.066 |

Table 14

## SUMMARY OF RESULTS OF PCB DETERMINATIONS ON ANIMAL TISSUE COLLECTED AT WIDE BEACH, ERIE COUNTY, NEW YORK

| Station[a] | Location | Collection Date | Sample Type | Number[b] of Subsamples | Concentration Aroclor 1254 (mg/kg) | % Lipids | Concentrations Normalized for % Lipids (mg/kg) |
|---|---|---|---|---|---|---|---|
| 1 | Roadside shrub | 28 AUG 84 | Liver tissue | 8 | 15.0 | 1.64 | 9.2 |
| 2 | Backyard | 28 AUG 84 | Liver tissue | 8 | 220.0 | 3.16 | 69.6 |
| 3 | Wetland | 30 AUG 84 | Liver tissue | 9 | 9.5 | 1.42 | 6.7 |
| 4 | Wetland, Control | 29 AUG 84 | Liver tissue | 5 | 0.27 | 2.72 | 0.1 |
| 5 | Roadside, Control | 30 AUG 84 | Liver tissue | 4 | ND[c] | 2.12 | ND |

(a) Refer to Plate 1 and Figure A-2 (in Appendix A) for actual location of trap lines.
(b) Liver samples from organisms captured were composited.
(c) ND = not detected.

Table 15

PCBs with four or fewer chlorines are biodegradable, however, at a slow rate. Tucker (1975) found that only 19 percent of Aroclor 1254 was degraded in 48 hours of treatment with activated sludge. Under controlled conditions, Aroclor 1254 can be degraded by soil microorganisms, with the rates for biodegradation in sediment ranging between $10^{-10}$ to $10^{-13}$ nanograms/millimeter-hour (ng/ml-hr) (NAS 1980). Thus, although it is unlikely that biodegradation will be significant at Wide Beach, there may ultimately be some removal of congeners with four or less chlorines.

The by-products of PCB metabolism by soil microorganisms are largely unknown. However, studies of mammalian metabolism (Matthews, 1983) and aquatic microorganisms (Shiarls and Sayler, 1982) have identified several classes of metabolic products. Extrapolation from these studies to soil systems gives the best indication of potential soil metabolites. The major chemical classes of metabolites are chlorinated benzoic acids, hydroxylchlorobiphenyls, and dihydrodichlorobiphenyls. Shiarls and Sayler identified chlorobenzoyl formic acid (chlorophenylglyoxylic acid) as a product of aquatic degradation, thus substituted glyoxylic acids may also be a soil metabolite. Because the chemical characteristics and toxicities of these compounds are not well defined, the fate and effects of the metabolites are very difficult to predict.

PCB metabolites will be more mobile in ground water than PCBs due to their greater water solubilities and diminished lipophilicity. Thus, it is likely that if microbial degradation is occurring at the site, the ground water could become contaminated with metabolites. Generally, the higher water solubilities and biodegradability of the monochlorobenzoic acids suggest that they will not pose an environmental threat or health hazard (EA Engineering).

While dichlorobenzoic acids appear to be more acutely toxic than Aroclor 1254, there is no information to indicate their chronic toxicity, mutagenicity, or carcinogenesis relative to PCBs. A potential problem associated with the environmental fate of PCBs is the formation of polychlorinated dibenzofurans (PCDFs). Converted from PCBs by heat or photolytic processes, PCDFs have been found to be considerably more toxic than PCBs (Bardiera 1984). PCDFs, however, were not detected at Wide Beach.

°Other Contaminants

In addition to PCB Aroclor 1254, relatively low levels of several organic priority pollutants were found at the site, including methylene chloride, acetone, tetrachloroethene, fluorotrichloromethane, xylene, trihalomethane, chrysene, fluoranthene, pyrene, benzo (a) anthracene, benzo (a) pyrene, bis (2-ethylhexyl) phthalate, di-n-butylphthalate and 1,2,4-trichlorobenzene (see Tables 16 and 17). A typical Aroclor 1254-based transformer dielectric contains tri- and tetra-chlorobenzenes in addition to 45 percent PCBs and organic stabilzers (NIOSH 1977). Phthlates and 1,2,4-trichlorobenzene have been used in dielectric fluids. Trichlorobenzenes have been used in conjunction with PCBs in transformers. Methylene chloride and acetone are probably laboratory or sampling artifacts, and the Bis (2-ethylhexyl) phthalate is a common plasticizer and rather ubiquitous in the environment.

The presence of organics at the site is significant because the mobility of the PCBs is not only related to the mobility of the carrier oil, but to other organics present, as well.

Table 18 illustrates the metals found in the on-site soil samples. No evidence of significant inorganic contamination, however, was found in water samples at Wide Beach (see Tables 19 and 20). Nickel was somewhat elevated as compared to national averages, however, this is probably naturally occurring (EA Engineering). Other metals were within average values for U.S. soils. With respect to semi-metals, selenium, the origin of which is unknown, was found at soil levels beyond the range of typical values.

°Human Health

It may be concluded that some degree of contamination exists over the entire Wide Beach Development site. The most significant levels of contamination were found in the sewer trench well samples, soils adjacent to the roadways, and wetlands sediments. Soil contamination is primarily surficial. The distribution of PCBs indicates that transport may have occurred by pedestrian and vehicular traffic, by stormwater runoff, by atmospheric dispersion, and by previous excavation and relocation activities. Although much of the contamination has been covered, it is not necessarily contained by the roadway, driveway, and drainage ditch paving. Possible exposure to PCBs are generally analyzed by route: ingestion, inhalation, or dermal exposure.

SUMMARY OF VOLATILE ORGANICS DETERMINATIONS (ug/kg) FOR SOIL SAMPLES
COLLECTED AT WIDE BEACH, ERIE COUNTY, NEW YORK, SEPTEMBER 1984

| Location | Collection Date | Sample Depth | Sample Type | Methylene Chloride | Tetra-chloroethene | Acetone | Fluoro-trichloromethane |
|---|---|---|---|---|---|---|---|
| Outfall 2 | 12 SEP 84 | 0-6 in. | Soil | 60 | 27 | -- | -- |
| B-1 | 12 SEP 84 | 9-9.5 ft | Soil | 160 | -- | 260 | -- |
| B-2 | 12 SEP 84 | 7.5-8 ft | Soil | 60 | -- | -- | 12 |
| B-4 | 13 SEP 84 | 7-7.5 ft | Soil | -- | -- | -- | 48 |
| B-5 | 24 SEP 84 | 0-6 in. | Soil | 260 | -- | -- | -- |
| B-5 | 24 SEP 84 | 9-9.5 ft | Soil | 40 | -- | -- | -- |
| B-6 | 27 SEP 84 | 0-6 in. | Soil | 300 | -- | -- | -- |
| B-6 | 27 SEP 84 | 9.5-10 ft | Soil | 230 | -- | -- | -- |
| MW-5 | 24 SEP 84 | 0-6 in. | Soil | 200 | -- | -- | -- |
| MW-5 | 24 SEP 84 | 8-8.5 ft | Soil | 350 | -- | -- | -- |
| MW-6 | 25 SEP 84 | 0-4 in. | Soil | 260 | -- | -- | -- |

Note: A dashed line indicates that compound was not detected in the sample.

## SUMMARY OF BASE/NEUTRAL COMPOUNDS DETECTED IN SOILS COLLECTED FROM MONITORING WELLS AND BORING LOCATIONS, WIDE BEACH, NEW YORK

| Station | Location | Di-n-butyl phthalate | Chrysene | Fluoranthene | Pyrene | Benzo(a) anthracene | Benzo(a) pyrene | Benzo(g,h,i) perylene | Bis(2-ethylhexyl) phthalate |
|---|---|---|---|---|---|---|---|---|---|
| MW-6 | Surficial | -- | -- | -- | -- | -- | -- | -- | 6.0 |
| MW-6 | Deep | -- | 0.1 | -- | -- | -- | -- | -- | -- |
| B-1 | Deep | 0.2 | -- | -- | -- | -- | -- | -- | -- |
| B-2 | Deep | 2.4 | -- | -- | -- | -- | -- | -- | -- |
| B-4 | Deep | 8.5 | 0.1 | -- | -- | -- | -- | -- | -- |
| B-5 | Surficial | -- | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | -- |
| B-6 | Surficial | -- | -- | -- | -- | -- | -- | -- | 1.2 |

Table 17

## SUMMARY OF METAL, PHENOL, AND CYANIDE CONCENTRATIONS DETERMINED IN SOIL SAMPLES COLLECTED FROM THE VICINITY OF THE TOWN OF BRANT, ERIE COUNTY, NEW YORK

| Station Location | Source | Collection Date | Antimony (mg/kg) | Arsenic (mg/kg) | Beryllium (mg/kg) | Cadmium (mg/kg) | Chromium (mg/kg) | Copper (mg/kg) | Lead (mg/kg) | Mercury (mg/kg) | Nickel (mg/kg) | Selenium (mg/kg) | Silver (mg/kg) | Thallium (mg/kg) | Zinc (mg/kg) | Total Phenolics (mg/kg) | Total Cyanide (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surficial Outfall 2 | | 12 SEP 84 | <0.1 | 25 | 0.52 | 0.30 | 27 | 21 | 22 | 0.073 | 42 | 0.1 | <0.01 | 1.4 | 73 | <0.4 | <0.06 |
| B-1 Sample 9 (7.5-8.0 ft) | Core | 12 SEP 84 | <0.1 | 22 | 0.69 | 0.14 | 22 | 31 | 13 | 0.054 | 74 | 3.0 | 0.02 | 1.0 | 84 | <0.4 | <0.06 |
| B-1 Sample 10 (9.0-9.5 ft) | Core | 12 SEP 84 | <0.1 | 21 | 0.65 | 0.16 | 22 | 31 | 6 | 0.044 | 74 | 1.9 | 0.02 | 0.9 | 79 | <0.4 | <0.07 |
| B-2 Sample 4 (7.5-8.0 ft) | Core | 12 SEP 84 | <0.1 | 50 | 0.63 | 0.04 | 19 | 29 | 16 | 0.019 | 52 | 2.5 | <0.01 | 0.7 | 88 | <0.4 | <0.06 |
| B-2 Sample 5 (9.5-10.0 ft) | Core | 12 SEP 84 | <0.1 | 49 | 0.62 | 0.15 | 20 | 30 | 17 | 0.035 | 78 | 2.5 | <0.01 | 0.8 | 94 | <0.4 | <0.07 |
| B-3 Sample 5 (7.5-8.0 ft) | Core | 12 SEP 84 | <0.1 | 79 | 0.60 | 0.04 | 18 | 29 | 14 | 0.029 | 60 | 1.3 | <0.01 | 0.7 | 81 | <0.4 | <0.08 |
| B-3 Sample 6 (9.5-10.0 ft) | Core | 12 SEP 84 | <0.1 | 21 | 0.73 | 0.16 | 20 | 30 | 15 | 0.048 | 60 | 3.6 | <0.01 | 0.8 | 91 | <0.4 | <0.07 |
| B-4 Sample 4 (7.0-7.5 ft) | Core | 13 SEP 84 | <0.1 | 33 | 0.81 | 0.10 | 21 | 31 | 15 | 0.026 | 62 | 1.3 | <0.01 | 0.8 | 91 | <0.4 | <0.08 |
| B-4 Sample 5 (8.0-8.5 ft) | Core | 13 SEP 84 | <0.1 | 24 | 0.75 | 0.20 | 20 | 35 | 14 | 0.039 | 66 | 1.4 | <0.01 | 1.0 | 103 | <0.4 | <0.08 |
| B-5 Surficial (0-6 ft) | Core | 24 SEP 84 | 5.2 | 17 | 0.50 | 0.30 | 11 | 19 | 76 | 0.018 | 28 | 6.2 | 0.04 | 0.8 | 186 | <0.4 | <0.07 |
| B-5 Sample 5 (9.0-9.5 ft) | Core | 24 SEP 84 | 6.5 | 19 | 0.43 | 0.14 | 9 | 18 | 30 | 0.047 | 32 | 9.9 | 0.03 | 1.1 | 96 | 0.4 | <0.07 |
| B-6 Surficial (0-6 ft) | Core | 27 SEP 84 | 4.7 | 12 | 0.42 | 0.24 | 10 | 14 | 94 | 0.042 | 20 | 0.5 | 0.02 | 0.6 | 122 | <0.4 | 0.08 |
| B-6 Sample 5 (9.5-10.0 ft) | Core | 27 SEP 84 | 11.8 | 14 | 0.59 | 0.30 | 16 | 29 | 36 | 0.050 | 37 | 2.0 | 0.03 | 0.9 | 149 | 0.5 | 0.07 |
| IM-5 Surficial (0-6 ft) | Core | 24 SEP 84 | 3.0 | 8 | 0.38 | 0.16 | 7 | 6 | 20 | 0.050 | 15 | 0.7 | 0.03 | 0.8 | 98 | 0.4 | 0.08 |
| IM-5 Sample 4 (8.0-8.5 ft) | Core | 24 SEP 84 | 9.4 | 22 | 0.62 | 0.21 | 18 | 55 | 34 | 0.055 | 48 | 0.3 | 0.04 | 0.6 | 162 | <0.3 | <0.08 |
| IM-6 Sample 5 (10.5-11.0 ft) | Core | 25 SEP 84 | 11.5 | 9 | 0.49 | 0.34 | 5 | 30 | 33 | 0.040 | 41 | 10.2 | 0.05 | 1.6 | 168 | 0.5 | <0.08 |
| IM-6 Surficial (0-6 ft) | Core | 25 SEP 84 | 10.6 | 19 | 0.58 | 0 25 | 14 | 21 | 49 | 0.046 | 31 | 0.2 | 0.02 | 0.8 | 144 | <0.4 | <0.07 |

Table 18

## SUMMARY OF METALS, CYANIDE, AND PHENOL DETERMINATIONS (mg/1) OF AQUEOUS SAMPLES COLLECTED FROM MONITORING WELLS, WIDE BEACH, ERIE COUNTY, NEW YORK

| Parameter | Sample Type | MW-1 | MW-2 | MW-3 | MW-4 | MW-5 | MW-6 | MW-7 | MW-8 |
|---|---|---|---|---|---|---|---|---|---|
| Total Cyanide | Water | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Antimony | Water | 0.034 | 0.025 | 0.030 | 0.007 | 0.031 | 0.025 | <0.002 | 0.038 |
| Arsenic | Water | <0.002 | <0.002 | 0.005 | 0.006 | <0.002 | <0.002 | <0.002 | 0.003 |
| Beryllium | Water | <0.0005 | 0.0019 | <0.0005 | 0.0017 | 0.0017 | <0.0005 | <0.0005 | <0.0005 |
| Cadmium | Water | 0.0037 | 0.0072 | 0.0062 | 0.0028 | 0.0023 | 0.0018 | 0.0020 | 0.0049 |
| Total Chromium | Water | 0.002 | <0.001 | 0.002 | <0.001 | <0.001 | 0.001 | 0.007 | 0.003 |
| Copper | Water | 0.004 | 0.005 | 0.003 | 0.003 | 0.003 | 0.010 | 0.014 | 0.042 |
| Lead | Water | 0.003 | 0.007 | 0.004 | <0.001 | 0.002 | 0.002 | 0.002 | 0.007 |
| Mercury | Water | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Nickel | Water | 0.600 | 0.232 | 1.21 | 0.115 | 0.308 | 0.274 | 0.298 | 0.407 |
| Selenium | Water | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Silver | Water | <0.0001 | 0.0004 | <0.0001 | 0.0003 | 0.0004 | <0.0001 | <0.0001 | <0.0001 |
| Thallium | Water | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 | <0.001 | <0.001 |
| Zinc | Water | 0.071 | 0.064 | 0.057 | 0.022 | 0.043 | 0.042 | 0.030 | 0.428 |
| Phenols | Water | 0.01 | 0.06 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |

Table 19

# SUMMARY OF METAL CONCENTRATIONS DETERMINED IN AQUEOUS SAMPLES COLLECTED FROM RESIDENCES OF THE TOWN OF BRANT, ERIE COUNTY, NEW YORK

| Station | Location | Source | Collection Date | Sample Type | Antimony (ug/L) | Arsenic (ug/L) | Beryllium (ug/L) | Cadmium (ug/L) | Chromium (ug/L) | Copper (ug/L) | Lead (ug/L) | Mercury (ug/L) | Nickel (ug/L) | Selenium (ug/L) | Silver (ug/L) | Thallium (ug/L) | Zinc (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 86 Oval | Gillig | Kitchen tap | 22 AUG 84 | Water | 3 | <2 | <0.5 | 1.0 | 1 | 48 | 7 | <0.25 | 36 | <2 | 0.2 | <1 | 0.61 |
| 96 Oval | Shanahan | Kitchen tap | 22 AUG 84 | Water | 3 | <2 | <0.5 | 0.7 | 7 | 78 | 3 | <0.25 | 25 | <2 | <0.1 | <1 | 0.04 |
| 101 Oval | Lundberg | Kitchen tap | 22 AUG 84 | Water | 3 | <2 | <0.5 | 0.4 | 2 | 10 | 2 | <0.25 | 32 | <2 | <0.1 | <1 | 0.06 |
| 70 Oval | Hockman | Outside tap | 22 AUG 84 | Water | 3 | <2 | <0.5 | 0.1 | 7 | 17 | 3 | <0.25 | 31 | <2 | <0.1 | <1 | 0.59 |
| 63 Oval | Plewak | Kitchen tap | 25 AUG 84 | Water | 3 | <2 | <0.5 | 0.4 | 1 | 11 | 5 | <0.25 | 26 | <2 | 0.7 | <1 | 0.88 |
| 65 Oval | Hickey | Kitchen tap | 22 AUG 84 | Water | 3 | <2 | <0.5 | 0.4 | 2 | 7 | 3 | <0.25 | 33 | <2 | 0.2 | <1 | 0.40 |
| 60 Oval | Militello | Basement tap | 22 AUG 84 | Water | 2 | <2 | <0.5 | 0.8 | 1 | 100 | 27 | <0.25 | 41 | <2 | 0.2 | <1 | 2.8 |
| 60 Oval | Militello | Kitchen tap | 22 AUG 84 | Water | 3 | <2 | <0.5 | 0.6 | 1 | 34 | 3 | <0.25 | 17 | <2 | 0.3 | <1 | 0.40 |
| 9 South | Bauer | Kitchen tap | 24 AUG 84 | Water | 3 | <2 | <0.5 | 0.2 | <1 | 4 | 4 | <0.25 | 8 | <2 | <0.1 | <1 | 0.05 |
| 48 Oval | Franz | Kitchen tap | 24 AUG 84 | Water | 3 | 3 | <0.5 | 0.9 | 2 | 71 | 4 | <0.25 | 32 | <2 | 0.2 | <1 | 1.3 |
| 9 Wide Beach | Bowen | Kitchen tap | 24 AUG 84 | Water | 3 | <2 | <0.5 | 0.3 | 4 | 160 | 14 | <0.25 | 53 | <2 | 0.2 | <1 | 0.10 |
| 135 Oval | Pronobis | Outside tap | 25 AUG 84 | Water | 3 | <2 | <0.5 | 0.4 | 2 | 8 | 14 | <0.25 | 23 | <2 | <0.1 | <1 | 1.1 |
| 10870 Lakeshore Rd | Lyford | Kitchen tap | 25 AUG 84 | Water | <2 | <2 | <0.5 | 0.1 | 1 | 30 | 17 | <0.25 | 94 | <2 | 0.2 | <1 | 0.04 |
| 21 South | Burke | Kitchen tap | 25 AUG 84 | Water | <2 | <2 | <0.5 | <0.1 | 1 | 11 | 2 | <0.25 | 56 | <2 | 0.6 | <1 | 0.07 |
| 117 Oval | Murphy | Kitchen tap | 24 AUG 84 | Water | <2 | <2 | <0.5 | <0.1 | 2 | 9 | 2 | <0.25 | 32 | 3 | <0.1 | <1 | 0.04 |
| 59 Oval | Allen | Kitchen tap | 24 AUG 84 | Water | <2 | <2 | <0.5 | 0.7 | 1 | 9 | 8 | <0.25 | 20 | 3 | 0.2 | <1 | 0.37 |
| Oval | Miller | Outside tap | 24 AUG 84 | Water | <2 | <2 | <0.5 | 0.2 | 2 | 10 | 6 | <0.25 | 23 | <2 | <0.1 | <1 | 0.09 |
| 73 Oval | Major | Kitchen tap | 24 AUG 84 | Water | <2 | <2 | <0.5 | 35 | 2 | 61 | 31 | <0.25 | 82 | <2 | 0.3 | <1 | 3.5 |
| 18 Oval | Gajewski | Kitchen tap | 24 AUG 84 | Water | <2 | 3 | <0.5 | 0.8 | <1 | 15 | 5 | <0.25 | 16 | <2 | 0.3 | <1 | 0.91 |
| 128 Oval | Plewak | Kitchen tap | 24 AUG 84 | Water | <2 | <2 | <0.5 | 0.1 | 2 | 9 | 2 | <0.25 | 32 | <2 | <0.1 | <1 | 0.14 |
| 20 South | Militello | Tank | 25 AUG 84 | Water | <2 | <2 | <0.5 | 0.2 | 3 | 160 | 24 | <0.25 | 48 | <2 | 1.2 | <1 | 0.30 |
| 35 Oval | Murphy | Kitchen tap | 25 AUG 84 | Water | <2 | <2 | <0.5 | 0.3 | 1 | 15 | 2 | <0.25 | 27 | <2 | 0.2 | <1 | 0.41 |
| 26 South | Zender | Kitchen tap | 25 AUG 84 | Water | <2 | <2 | <0.5 | <0.1 | 2 | 8 | 2 | <0.25 | 32 | 3 | <0.1 | <1 | 0.02 |
| 29 Oval | Morgante | Kitchen tap | 25 AUG 84 | Water | <2 | <2 | <0.5 | 0.2 | 1 | 7 | <1 | <0.25 | 21 | <2 | <0.1 | <1 | 0.25 |
| 30 Fox | Newman | Kitchen tap | 25 AUG 84 | Water | <2 | <2 | <0.5 | 0.3 | 2 | 11 | 17 | <0.25 | 24 | <2 | <0.1 | <1 | 0.10 |
| 37 Oval | Guerra | Kitchen tap | 27 AUG 84 | Water | <2 | <2 | 0.7 | 0.3 | 2 | 39 | 3 | <0.25 | 34 | <2 | <0.1 | <1 | 0.04 |
| 38 Oval | North | Kitchen tap | 27 AUG 84 | Water | <2 | <2 | <0.5 | 0.1 | 1 | 22 | 2 | <0.25 | 23 | <2 | <0.1 | <1 | 0.26 |
| 81 Oval | Perbach | Kitchen tap | 29 AUG 84 | Water | <2 | <2 | 0.5 | 0.7 | 2 | 37 | 7 | <0.25 | 26 | <2 | <0.1 | <1 | 2.1 |
| 124 Oval | Murphy | Kitchen tap | 4 SEP 84 | Water | <2 | <2 | 0.5 | 0.1 | 3 | 43 | 2 | <0.25 | 23 | <2 | 0.3 | <1 | 0.04 |
| 35 Lotus Bay Rd | Lotus Bay | Kitchen tap | 22 AUG 84 | Water | 3 | <2 | <0.5 | 0.3 | <1 | 4 | 1 | <0.25 | 19 | <2 | 0.2 | <1 | 0.07 |
| 35 Lotus Bay Rd | Lotus Bay | Basement tap | 22 AUG 84 | Water | 4 | <2 | <0.5 | 0.3 | <1 | 8 | 1 | <0.25 | 22 | <2 | <0.1 | <1 | 0.04 |
| 25A Cottage | Snyder Beach | Kitchen tap | 22 AUG 84 | Water | 4 | <2 | <0.5 | 0.2 | <1 | 17 | 1 | <0.25 | 10 | 2 | <0.1 | <1 | 0.15 |
| 18 Gravel Rd | Snyder Beach | Outside tap | 22 AUG 84 | Water | 4 | <2 | <0.5 | 0.7 | <1 | 100 | 3 | <0.25 | 28 | <2 | <0.1 | <1 | 0.19 |
| 21 Gravel Rd | Snyder Beach | Outside tap | 22 AUG 84 | Water | 4 | <2 | <0.5 | 1.0 | 2 | 44 | 6 | <0.25 | 22 | 2 | 0.3 | <1 | 0.85 |
| 85 Oval | Mason | Kitchen tap | 22 AUG 84 | Water | 4 | 2 | <0.5 | 0.2 | <1 | 9 | 3 | <0.25 | 28 | 3 | 0.2 | <1 | 0.06 |
| 21 Oval | Helmich | Kitchen tap | 22 AUG 84 | Water | 4 | <2 | <0.5 | 0.1 | 1 | 17 | 2 | <0.25 | 55 | 2 | 0.2 | 5 | 0.53 |
| 76 Oval | Militello | Kitchen tap | 22 AUG 84 | Water | 4 | 2 | <0.5 | 0.2 | <1 | 25 | <1 | <0.25 | 10 | <2 | 0.2 | <1 | 0.09 |
| 82 Oval | Grey | Kitchen tap | 22 AUG 84 | Water | 4 | 3 | <0.5 | 0.3 | <1 | 12 | 1 | <0.25 | 27 | <2 | <0.1 | <1 | 0.05 |
| 67 Oval | Schultz | Washroom tap | 22 AUG 84 | Water | 4 | <2 | <0.5 | 0.3 | 2 | 10 | 6 | <0.25 | 26 | 2 | <0.1 | <1 | 0.10 |
| 17 South | Rogers | Kitchen tap | 23 AUG 84 | Water | <2 | <2 | <0.5 | <0.1 | 2 | 14 | 2 | <0.25 | 48 | <2 | <0.1 | <1 | 0.14 |
| 43 South | Hannen | Kitchen tap | 23 AUG 84 | Water | 2 | <2 | <0.5 | 0.3 | 1 | 31 | 3 | <0.25 | 40 | <2 | <0.1 | <1 | 0.17 |
| 39 South | Speck | Kitchen tap | 23 AUG 84 | Water | <2 | 2 | <0.5 | <0.1 | <1 | 11 | <1 | <0.25 | 32 | <2 | 0.2 | <1 | 0.02 |
| 95 Oval | Aurello/Mach | Basement tap | 23 AUG 84 | Water | 2 | 3 | <0.5 | 0.7 | 2 | 48 | 12 | <0.25 | 8 | 3 | 0.2 | <1 | 0.26 |
| 107 Oval | Oehler | Kitchen tap | 23 AUG 84 | Water | <2 | 2 | <0.5 | 0.1 | 2 | 41 | 2 | <0.25 | 32 | <2 | 0.3 | <1 | 0.79 |
| 108 Oval | Murphy | Kitchen tap | 23 AUG 84 | Water | <2 | 3 | <0.5 | <0.1 | 2 | 8 | 2 | <0.25 | 27 | <2 | 0.2 | <1 | 0.08 |
| 109 Oval | Lojacono | Kitchen tap | 23 AUG 84 | Water | 3 | <2 | <0.5 | <0.1 | 2 | 10 | 2 | <0.25 | 29 | <2 | 0.3 | <1 | 0.02 |
| 125 Oval | Prince | Kitchen tap | 23 AUG 84 | Water | <2 | <2 | <0.5 | <0.1 | 1 | 19 | 2 | <0.25 | 44 | <2 | 0.3 | 1 | 0.05 |
| 141 Oval | Meyers | Kitchen tap | 23 AUG 84 | Water | 3 | <2 | <0.5 | <0.1 | 2 | 14 | 2 | <0.25 | 43 | <2 | <0.1 | <1 | 0.08 |
| 1 Oval | Grabenstatter | Tank | 23 AUG 84 | Water | 3 | <2 | <0.5 | <0.1 | 2 | 290 | 44 | <0.25 | 48 | <2 | 0.2 | 1 | 0.13 |
| 18 Fox | Canteline | Tank | 23 AUG 84 | Water | <2 | 3 | <0.5 | 0.7 | 2 | 69 | 4 | <0.25 | 36 | <2 | 0.2 | <1 | 0.24 |
| 11 Oval | Roe | Kitchen tap | 23 AUG 84 | Water | 2 | <2 | <0.5 | 0.1 | 3 | 11 | 3 | <0.25 | 50 | <2 | 0.3 | <1 | 0.02 |
| 2 South | Hellman | Kitchen tap | 23 AUG 84 | Water | 2 | <2 | <0.5 | 0.1 | 2 | 11 | 2 | <0.25 | 43 | <2 | 0.2 | <1 | 0.19 |
| 3 South | Busch | Outside tap | 23 AUG 84 | Water | 2 | 3 | <0.5 | <0.1 | 2 | 200 | 17 | <0.25 | 50 | <2 | 0.6 | 1 | 0.05 |
| 7 South | Mueller | Outside tap | 23 AUG 84 | Water | 3 | 2 | <0.5 | 0.2 | 2 | 300 | 16 | <0.25 | 32 | <2 | <0.1 | <1 | 0.16 |
| 84 Lotus Bay Rd | Lotus Bay | Kitchen tap | 23 AUG 84 | Water | 2 | 2 | <0.5 | 0.2 | <1 | 3 | <1 | <0.25 | 15 | <2 | <0.1 | <1 | 0.04 |
| 10750 Old Lakeshore | Lotus Bay | Kitchen tap | 23 AUG 84 | Water | 3 | <2 | <0.5 | 0.4 | <1 | 50 | 14 | <0.25 | 27 | <2 | <0.1 | <1 | 1.4 |
| Field blank | NA | N/A | N/A | Deionized water | 2 | <2 | <0.5 | 0.2 | <1 | 61 | 2 | <0.25 | <1 | <2 | <0.1 | <1 | 0.04 |
| Farnham | Fire Hall | Kitchen tap | 23 AUG 84 | Water | 3 | <2 | <0.5 | 0.2 | <1 | 15 | 2 | <0.25 | 7 | <2 | <0.1 | <1 | 0.01 |

Table 20

There are two potential routes for ingestion of soil-borne PCBs, through contaminated food stuffs and through direct consumption of soil. Research has shown that plant tissues accumulate PCBs, however, the association between PCBs and plant tissues is primarily a surface phenomenon. Fries and Marrow (1981) concluded that plants grown in PCB-contaminated soil were not contaminated by root uptake and translocation, but foliar contamination via vapor sorption. Although no standards for PCB levels in root crops exist, the Wide Beach community has been advised against consuming any locally-grown root crops.

Direct ingestion of soil by children either habitually (Pica) or casually, may be a significant route of exposure. Mahaffey (1977) estimated that 6 to 50 percent of young children showed evidence of the Pica syndrome with an average ingestion of 0.5 grams of soil per day.

Absorption in the gastrointestinal tract is important pharmacokinetically. Albro and Fishbein (1972) studied intestinal absorption of PCBs in rats and concluded that at least 90 percent was absorbed, reflecting the high lipophilicity of PCBs.

PCBs may be inhaled either directly from the vapor phase or sorbed onto inhalable particles. The problem of inhalation is compounded by the occurrence of a substantial background of atmospheric PCBs. In the Lake Erie area, the median atmospheric PCB concentration is 2.0 $ng/m^3$ (Eisenreish & Johnson 1983).

The pulmonary system is highly efficient with respect to PCB absorption (EPA 1980, NIOSH 1977). Since the respiratory epithelium behaves like a lipoid-pore-type membrane, the uptake of hydrophobic compounds is related to their octanol-water partition coefficients (Lubawy 1982). Partition coefficients for Aroclor 1254 range between $1.3 \times 10^6$ and $6.3 \times 10^6$ (Mackay 1983), which accounts for the rapid and efficient absorption. Based on data measured by Benthe (1972) for exposure of Wistar rats to atmospheric PCBs, calculations reveal an air-liver partition coefficient of $3.0 \times 10^{-2}$ during exposure. Following exposure, the liver concentration increased until a partition coefficient of 0.15 was reached. This facile transport supports environmental and occupational studies of pulmonary absorption.

Prior to roadpaving, based upon PCB atmospheric respiration rates derived by the International Commission on Radiological Protection (1975), and an ambient air-concentration of 0.22 $ug/m^3$, the average male adult at Wide Beach would have been exposed to 120 mg and the average female to 110 mg, over a 70-year lifetime.

Although skin absorption of PCBs is well documented, its magnitude cannot be quantified due to the interference of simultaneous inhalation. Since the majority of PCBs bind to the soil, its bioavailability is probably decreased.

Scientific literature indicates that Aroclor 1254 is carcinogenic in laboratory animals, and is classified as a possible human carcinogen. As a result of the current and future potential exposure to PCBs, based upon a risk assessment, there is an elevated cancer risk for Wide Beach residents as compared to the general rural population.

The bis(2 ethyl hexyl)phthalate, chloroform, 3,4-benzofluoro-anthrene, and 1,1-dichloroethane in the soil do not represent a threat to public health at the concentrations detected. The 1,2,4-trichlorobenzene is a low to moderately toxic solvent, lubricant, and insecticide. This compound does not represent a significant threat to the community because it shows weak toxicity by respiration or ingestion. The arsenic, lead and selenium detected in the site's soils are toxic and also bio-accumulative in some cases.

°<u>Biota Toxicity</u>

The database regarding the effects of PCBs on aquatic plants is relatively small. Inhibition of plant growth due to PCBs has been documented mainly for algae. EPA (1980) reports toxic effects to unicellular plants at concentrations of Aroclor 1254 as low as 0.1 ug/1. Phytotoxicity has been described in the literature to occur at PCB soil concentrations as low as 100 mg/kg. Concentrations greater than 100 mg/kg were found in soils at the site.

Numerous effects have been noted on terrestrial macrophytes grown in soils containing PCBs. Effects on plants are probably due to interference with photosynthesis and respiration.

In addition to toxic effects on plants themselves, there is the problem of plant contamination and subsequent transfer to higher trophic levels. PCBs in soils have been demonstrated to contaminate plant roots. Absorption seems to be related to the water and oil content of the plant's root and, subsequently, its ability to accumulate lipophilic xenobiotics (Iwata 1974). Contamination of the foliage and stems is attributed primarily to adsorption to the leaves and stems from the air, and subsequent movement through the epidermal layers (Buckley 1982).

EPA (1980) recommends a criterion of 0.014 ug/1 as a 24-hour average for protection of aquatic life. During a storm event, the concentrations of Aroclor 1254 released into the wetlands south of The Oval could be high enough to pose a threat to aquatic life.

Studies concerning effects of PCBs on birds have shown reduced hatchability, teratogenic effects, decreased eggshell production, and shell thickness reproductive impairment. Avian toxicity has been demonstrated at feed PCB levels as low as 5 mg/kg. Mammalian toxicity has been demonstrated at feed PCB levels as low as 0.64 mg/kg. Soil PCB concentrations at Wide Beach could potentially produce feed levels at this magnitude.

Despite the implementation of an immediate removal action to prevent the exposure of the public to the high levels of PCBs present in the roadways and drainage areas, the 120 residents of Wide Beach may still be exposed to lower concentrations of PCBs remaining in their yards, open lots, and the wetlands. In addition, the existing storm system cannot accommodate the increased flow resulting from the paved surfaces, and ponding occurs on several yards after storm events.

Since the roadway pavement may only last 2 to 4 years, and since the public is still exposed to PCBs in the unpaved areas, it is imperative that action be taken to prevent exposure.

Enforcement

Five Potentially Responsible Parties (PRPs) have been identified to date. It is EPA's intention to offer the PRPs the opportunity to implement the remedy. If it appears that the PRPs are not willing to implement the remedy, or if negotiations are fruitless, then EPA may consider the issuance of a CERCLA §106 Administrative Order for the implementation of the remedial action, or EPA may initiate a cost recovery lawsuit at a later date.

Alternatives Evaluation

The primary objective of the FS was to evaluate remedial alternatives to identify a cost-effective approach consistent with the goals and objectives of CERCLA. A cost-effective remedial alternative as defined in the NCP (40 CFR 300.68j) is "the lowest cost alternative that is technologically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of the public health, welfare, or the environment." The NCP outlines procedures and criteria to be used in selecting the most cost-effective alternative.

The first step is to evaluate public health and environmental effects and welfare concerns associated with the problem. Criteria to be considered are outlined in 40 CFR Section 300.68(e) of the NCP and include such factors as actual or potential direct contact with hazardous material, degree of contamination of drinking water, and extent of isolation and/or migration of the contaminant. The next step is to develop a limited list of possible remedial alternatives which could be implemented. The no-action alternative should be included on the list.

The third step in the process is to provide an initial screening of the remaining alternatives. The costs, relative effectiveness in minimizing threats, and engineering feasibility are reviewed here. The no-action alternative may be included for further evaluation when response actions may cause greater environemental or health damage than no-action responses. A no-action alternative may also be included if it is appropriate relative to the extent of the existing threat or if response actions provide no greater protection.

From the evaluation of existing data and information on the nature and extent of the contamination associated with the Wide Beach Development site, the following remedial response objectives were established:

1. to protect the public from exposure to PCB-contaminated soils via inhalation, ingestion, and dermal contact.

2. to maintain an adequate, safe drinking water supply for the population that could be affected by ground water contamination.

The remedial response levels employed in the FS evaluation included:

| | |
|---|---|
| soil | < 10 mg/kg (EPA/NYSDEC soil removal criterion) |
| air | < 1.67 $ug/m^3$ (NY State Ambient Air Level) |
| ground water | < 1.00 ug/l (NYSDOH advisory level) |
| surface water | < 7.9 X 10-5 ug/l (Clean Water Act ambient water quality criteria for $10^{-6}$ lifetime cancer risk) |

With these objectives and response criteria in mind, a list of feasible remedial technologies was developed (see Table 21). Technologies identified as having the potential to meet the remedial response objectives were subjected to a two step evaluation process. The first step consisted of an initial screening of the candidate remedial alternatives based upon relative present worth cost, environmental impacts, and engineering considerations.

Summary of Remedial Alternatives

Source control alternatives for remediating the contaminated roadways, driveways, yards, drainage ditches, storm drains, and wetlands:

1. No action
2. Excavation, landfill, and soil replacement
3. Excavation, on-site treatment, and soil replacement
4. In-situ biological treatment
5. In-situ chemical treatment
6. Immobilization

Measures for protecting residential wells from contamination:

1a. No action
2a. Alternate water supply
3a. Public water supply

Table 21

Based upon the results of this initial screening, several source control alternatives were quickly screened out, including: Alternative 4, in-situ biological treatment; Alternative 5, in-situ chemical treatment; and Alternative 6, immobilization. Also screened out were measures to protect the individual private wells. Alternative 2a, alternative water supply and Alternative 3a, public water supply. The results of the initial screening process are described below and are summarized in Table 22.

°Alternative 1

Alternative 1, no action, consists of leaving the site as it currently exists while continuing to monitor site conditions. The roadway installed under the immediate removal action would be maintained for the duration of the 20-year planning period, as well. Because this alternative offers some measure of protection to the public by reducing exposure to PCB-contaminated dust and surface runoff, and because this alternative is feasible, it was retained for further consideration.

°Alternative 2

Because Alternative 2, excavation and disposal, employs one of the most often used and technically feasible means of remediation at hazardous waste sites, it has been retained for further consideration.

°Alternative 3

Alternative 3, excavation and on-site treatment, utilizes treatment systems that generally parallel standard wastewater treatment unit operations. Because this alternative offers a feasible means of treating wastes on-site rather than relocating them, it has been retained for further consideration.

°Alternative 4

Alternative 4, in-situ biological degradation was eliminated from further consideration.

## Summary of Initial Screening of Remedial Alternatives

| Alternative | Engineering Feasibility Source Control Measures | Environmental Effects | Costs |
|---|---|---|---|
| 1. No action | Roadway maintenance feasible. | Does little to protect environment. | Least costly alternative. |
| 2. Excavate and dispose | One of the most often used and technically feasible alternatives for hazardous waste site remediation. | Dust and noise during implementation. Hauling loss potential. | Most costly alternative. |
| 3. Excavate and treat on-site | Preliminary studies indicate a promising new and innovative chemical treatment technology. Biological treatment two month detention time in reactor negatively impacts feasibility. | Noise and dust during excavation. Chemical reagents could cause safety/environmental problems. | Moderate cost. |
| 4. In-situ biological treatment | Required environmental controls severely affect feasibility. | By-products potentially harmful. | Costly considering questionable feasibility. |
| 5. In-situ chemical treatment | Required environmental controls severely affect feasibility. | Chemical reagents could cause safety/environmental problems. | Costly considering questionable feasibility. |
| 6. Immobilization | Feasible, but required application rate unknown. | Required tilling could generate significant levels of dust. | Costly considering questionable feasibility. |
| **Water Supply Protection Measures** | | | |
| 1a. No action | Feasible | Removal of source will eliminate water contamination potential. Will protect public. | Least costly alternative. |
| 2a. Alternate water supply | Bottled water and other means feasible. | Would supply contaminant-free water to public. | Costly |
| 3a. Public water supply | Source available in neighboring locale. | Would supply contaminant free water to public. | Costly |

Table 22

In-situ biological degradation, Alternative 4, has been employed to enhance biochemical decomposition of PCBs in contaminated soils. However, there has been only limited application of the technology to Aroclor 1254, and only limited data are available on laboratory studies in providing treatment of Aroclor 1254. The transferability of the technology to field conditions is crucial in considering the applicability of in-situ biological treatment, since the viability of the organisms depends on soil conditions, including moisture content, organic content, oxygen content, pH, nutrient content, and temperature, as well as the indigenous microbial population.

The time required for the PCB degradation is expected to be on the order of several months. Therefore, the soil environment must be managed during that period to provide favorable conditions for treatment. To maintain optimal field conditions for that length of time would be extremely difficult, and would require an irrigation and drainage system. In addition, the treatment could only be applied during the summer months. Retilling and reapplication will most likely be required, as well.

In addition, the environmental effects of biological treatment are not well known, and it is also not clear what by-products would result from biological degradation. Available literature suggests that the resultant constituents could include chlorinated benzoic acids and dibenzofurans, and would likely be more soluble and mobile, and perhaps more toxic than the PCBs.

Because of the questionable nature of engineering feasibility of this alternative, it was deleted from further consideration.

°<u>Alternative 5</u>

Alternative 5, in-situ chemical treatment, can also be screened out.

A new chemical in-situ treatment procedure was developed recently under a research program sponsored by EPA. In general, the technology is based on the process of using a sodium-or potassium-based reagent to remove chlorine from the PCB molecules.

The engineering feasibility of providing in-situ chemical treatment of PCBs depends upon successful completion of chemical reactions in a soil environment. Control of that environment can be engineered to a certain degree. It is not clear, however, if the environment can be controlled to the degree required for in-situ chemical treatment. Past studies (Brunell and Singleton) have indicated that soil moisture is a major impediment to in-situ PCB treatment by chemical methods, and in fact, soil moisture may have to be maintained at 2-3 percent. In field applications, this requirement necessitates the application of an artificial heat source to remove most of the soil moisture.

Because of the questionable nature of the technology to provide a heat source and to design the overall system, in-situ chemical treatment was deleted from further consideration.

°Alternative 6

Alternative 6, immobilization, was also eliminated. Immobilization would immobilize the PCBs by the addition of activated carbon to the soil. Activated carbon is a strong sorbent and has been proven effective for Aroclor 1254 treatment. Powdered activated carbon is the preferred medium, because it can be readily incorporated into the soil, enables uniform distribution, and provides maximum adsorptive capacity per gram of material.

Since carbon degrades more readily than PCBs, a release of PCBs during carbon degradation is anticipated. Therefore, to maintain the immobilzation, reapplication is required. Of greater concern with carbon addition to the soil is the additional carbon requirements for the organic material currently present in the soil. It is expected that the carbon requirements for soil, especially that in the wetlands where there is a large amount of humus material, would be substantial.

Because the quantity of carbon required to meet all of the adsorptive requirements of the soil is expected to be substantial, because of the need for reapplication at least annually, and because of the costs associated with these application requirements, the alternative was deleted from further consideration.

°<u>Alternatives 2a and 3a</u>

PCB-contamination found in residential wells have been low and sporadic in occurrence. Since the implementation of a source control measure will effectively prevent further releases to the ground water, and since during EPA's immediate removal activities, particulate filters were installed on the private wells to protect the public in the interim, no action will be required to protect the water supply.

After the completion of the initial screening of the alternatives, a further evaluation was conducted in order to recommend a cost-effective remedial alternative. The alternatives undergoing the final evaluation included:

1. No action
2. Excavation, landfill (incineration for soil >500 mg/kg), and soil replacement
3. Excavation, chemical on-site treatment, and soil replacement.

This narrowed list of remedial alternatives was evaluated further according to the following criteria: technical feasibility, environmental effects, public health effects, and institutional/permit requirements.

According to the NCP, a total cost estimate must also be considered for remedial actions and must include both construction and annual operation and maintenance costs. These costs are estimated for the alternatives under consideration. A present worth value analysis was used to convert the annual operation and maintenance/monitoring costs to an equivalent single value. These costs were considered over a 20-year period at a 10 percent discount rate and 5 percent inflation.

°Alternative 1

In the summer of 1985, EPA performed an immediate removal action at the site, including the asphaltic paving of all roadways, drainage ditches, paths, driveways, and parking spaces. The existing gravel road bed was regraded and presently serves as the base course for a 10 cm layer of asphalt. The asphalt was installed as two 5 cm lifts with a geotextile liner between. The driveways, paths, and parking spaces were covered with a 5 cm asphaltic layer. In addition, home decontamination by vacuuming and rug cleaning, air conditioner and furnace filter replacement, and dual cartridge particulate filter installation on each water supply well was also performed. Under Alternative 1, no additional action would be performed at the site.

A reasonable natural mechanism for the rapid environmental degradation of PCBs at Wide Beach does not exist. Photolysis and biodegradation, two degradation mechanisms, occur at very slow rates and may yield harmful reaction by-products. Therefore, if no treatment or removal actions are taken at the site, natural degradation processes are likely to occur; but the rate and results are relatively unkown.

While the roadpaving activities have significantly reduced the amount of PCB-contaminated dust and surface runoff associated with the roadways, driveways, and drainage ditches, contamination of the yards, open lots, and wetlands would remain.

The RI determined that the levels of PCBs found in the front yards do not substantially differ from the levels found in the roads, and driveways. In fact, over 40 percent of the front yards have PCB-contamination at levels greater than the soil response level of 10 mg/kg, with levels up to 600 mg/kg.

In addition, the existing storm sewer system can not accommodate the increased stormwater runoff from the newly paved surfaces after storm events, resulting in ponding of water in the yards, as well as possible overland transport of PCB-contaminated soil particles to the wetlands and Lake Erie.

Because the reservoir of PCBs will not be diminished under the no-action alternative, water infiltrating the yards and through the bedding of the paved areas can lead to off-site transport of PCB-contaminated soil particles via the bedding of the sanitary sewer, gas, and other pipelines. Contaminated ground-water samples from the sewer trench support this potential transport theory.

Because of the inability to construct an adequate subbase and because of the resulting inability to resist freeze-thaw stresses, it has been estimated that the surfaces paved under the immediate removal action will deteriorate very quickly, possibly lasting only two to four years. Although the roadways can be maintained, approximately $4 million (present worth) would be required to maintain the roadways, as well as to perform extensive monitoring to insure that the public is being adequately protected. Over a twenty year planning period, roadway replacement would be required 5-10 times.

Consideration was given to improving the existing roadway so as to lengthen its estimated lifespan. However, this can only be accomplished by removing the asphalt and excavating to a depth of 0.15-0.3 m to construct an adequate subbase. Since an average depth of 0.5 m would be excavated under Alternatives 2 and 3, it would be more reasonable to excavate the additonal 0.20.35 m and remove the contaminated soil and reconstruct a roadway over it than to just improve the roadway subbase.

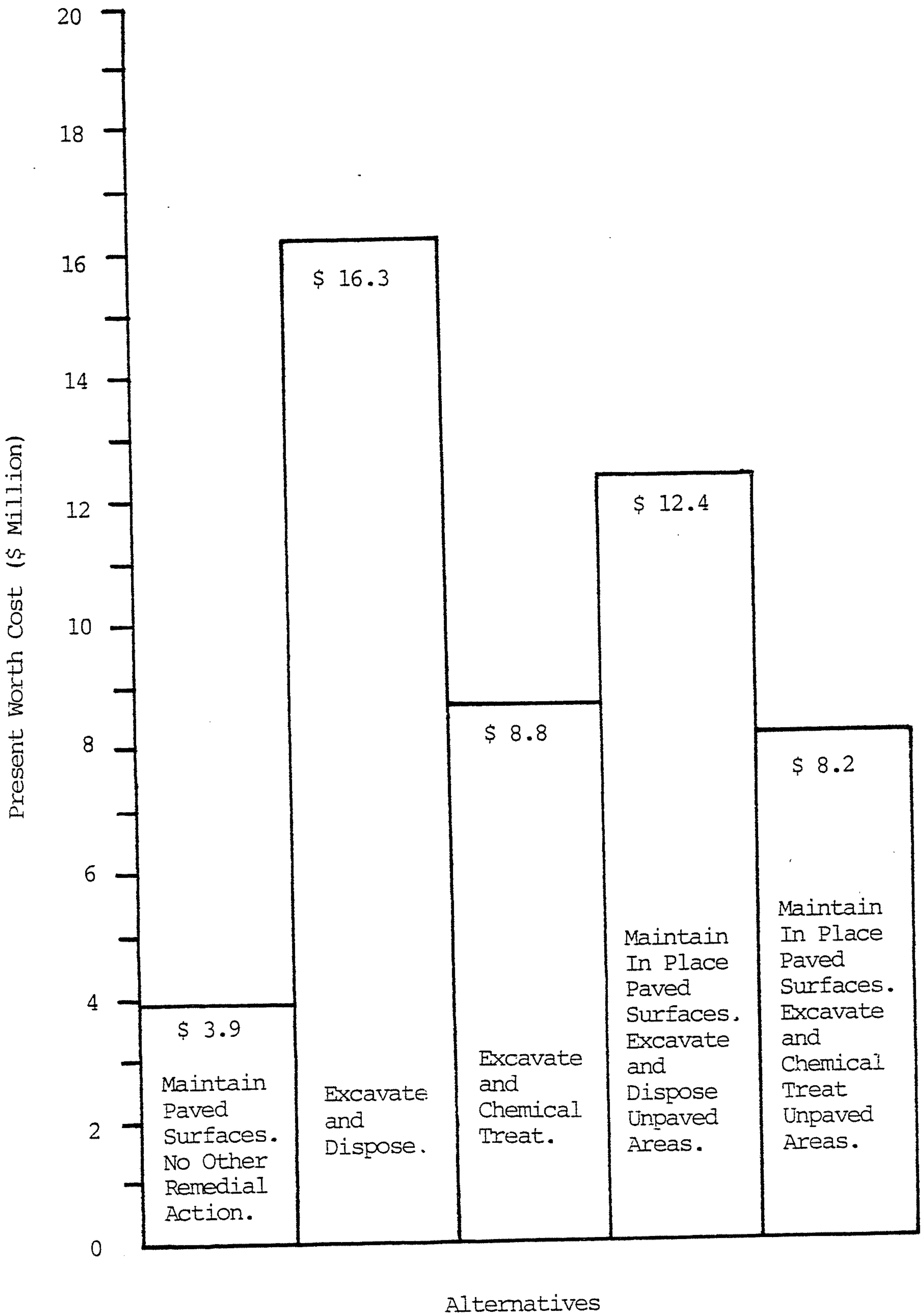
Also, consideration was given to leaving the roadway, drainage ditches, and driveway paving installed during the summer of 1985 in place, and implementing remedial action at only the contaminated yards, open lots, and wetlands. However, as was indicated above, because of the 2-4 year life expectancy for the asphalt, a present worth cost of approximately $3.9 million would be required to maintain the roadway and to monitor the site for a 20-year period. Added to the $4.3 million for excavating and chemically treating the contaminated yards, open lots, and wetland soils and sediments, the net present worth cost would be approximately $8.2 million; for off-site disposal of excavated yard, open lot, and wetland soils and sediments and leaving the existing roadway in place, approximately $12.4 million would be required. Compared to a present worth cost of $8.8 million for site-wide excavation and chemical treatment, and $16.3 million for site-wide excavation and disposal, there would be a cost savings of either $0.6 million or $3.9 million, respectively, if the paved areas are left intact. While leaving the existing paved surfaces in place and excavating and disposing of the unpaved areas is significantly less costly than site-wide excavation and disposal/incineration, considering the level of accuracy in the cost estimates, site-wide excavation and chemical treatment, and excavation and chemical treatment of the unpaved surfaces while leaving the paved surfaces in place, are close in cost. (Figure 9 summarizes this cost comparison analysis.) However, in terms of long-term protecton of public health and the environment, leaving the paved surfaces in place would not be the preferred solution.

°<u>Alternative 2</u>

Under Alternative 2, (soil removal, landfill, and replace) removal of PCB-contaminated soils requires that the PCB-contaminated soils and pavement material be transported to an approved landfill, and that all excavated areas be replaced/rebuilt to minimize infiltration and to maintain adequate runoff patterns.

The removal and disposal of contaminated soil, provides source elimination with a permanent remedy to prevent or mitigate the migration of a release of PCBs to the surrounding environment. This alternative is one of the most often used and technically feasible alternatives for remediation at a hazardous waste site.

The primary environmental effects associated with this alternative are related to mobilization of PCBs during the excavation and removal process. Earth moving operations associated with excavation may result in significant quantities of PCB-contaminated dust being released into the air. The erosion of PCB-contaminated soils during construction is also of concern. There is also the possibility of hauling losses from dump trucks enroute to the secure landfill.




Cost Comparison of Maintaining In Place Paved Surfaces and Other Remedial Alternatives, and Combinations

**Figure 9**

Other effects of excavating the contaminated soils will result from direct removal of the associated vegetation, especially from the wetlands area. Removal of trees and shrubs will result in the loss of habitat.

Removal of soil contaminated with PCBs to the >10 mg/kg level will meet the public health, welfare, and environmental objectives of remediation, it will not, however, result in ultimate destruction of the PCBs.

°Alternative 3

Alternative 3, (soil removal, treat on-site, replace) includes technologies that could be applied on-site to excavated soil and to remove the PCBs. Following application of the technologies, the treated soil would be used as fill in the excavated areas. In general, the treatment technologies applicable to this procedure are those in which reaction times are sufficiently short to permit complete treatment in a reaction vessel or continued treatment once soils are returned. The technologies include biological and chemical treatment.

On-site biological and chemical treatment require similar operational processes. In general, system requirements for on-site treatment parallel wastewater treatment unit operations. It is assumed that to meet mixing requirements the soil and chemical or biological reagents would be combined to form a soil/water/reagent slurry which could be pumped, mixed, and handled as a liquid material.

On-site biological treatment of PCB-contaminated soil has been investigated. One of the problems associated with biological treatment systems is the reaction/degradation products. A possible result of PCB degradation is the formation of polychlorinated dibenzofurans (PCDFs). In addition, it is apparent that on-site biological reactors can only be used for the mixing during the initial phase of the treatment. Since the detention time in a reactor is expected to be on the order of two months, in order for the technology to be feasible, the biological degradation would have to continue after soil replacement as fill in the excavated areas. Therefore, the soil environmental parameters which affect the biological activity would have to be managed to allow the treatment to continue. It, therefore, is not practical to consider complete treatment of the PCBs with an on-site, biological treatment unit.

On-site chemical treatment technologies can be applied to PCB degradation, and result in accelerated reactions with less environmental restrictions than biological systems. A chemical degradation process has been demonstrated to be applicable to PCB compounds (Brunelle 1985). This process requires a 2-step procedure. The first step involves the extraction of PCBs from the soil utilizing solvents. The solvents are then treated with a potassium-based reagent to remove chlorine atoms from the PCB molecule, yielding mainly phenols. Detention time in a chemical treatment reactor is expected to be on the order of several hours, significantly shorter than the several months required for biological treatment.

The limiting factor in the engineering feasibility of on-site chemical treatment is the ability of potassium polyethylene glycol to neutralize Aroclor 1254. Although in the developmental stage, the engineering feasibility of this technology appears promising. On-site chemical treatment is significantly more feasible than in-situ chemical treatment, which was deleted from consideration in the initial screening because the application of heat to maintain the soil moisture content at 2-3 percent so that the reaction will work, is technologically more feasible in a reaction vessel than in-situ. To date, the extraction process has been demonstrated to be the limiting process in PCB treatment, and extraction and treatment can be accomplished in 2 hours with a reagent of sufficient concentration (Brunelle 1985). To optimize extraction, the solvent requirements are substantial. To reduce solvent costs, a recovery and reuse system may be employed. The reactor capacity for the contaminated soil/reagent slurry must provide adequate volume to allow a sufficient detention period for the chosen feed rate.

The majority of the environmental effects associated with on-site chemical treatment are similar to those resulting from removal, landfilling, and replacement, including dust generation and erosion during excavation, as well as removal of vegetation and loss of habitat. In addition, on-site treatment will require considerably more heavy equipment and chemical process equipment present at the site for long periods of time. Additional problems, both to workers and the public, could result from contact with chemical reagents which are associated with on-site treatment. In addition, the end products of on-site chemical treatment have not been adequately characterized.

A pilot-scale treatability study would be required to determine key design parameters such as physical dimensions, operation temperatures and detention times.

On-site chemical treatment of soils contaminated with >10 mg/kg PCB will meet the objectives for protection of public health, welfare, and the environment. Chemical treatment for soil PCBs is an attractive method for remediation, as it results in the ultimate destruction of the contaminants, avoiding the hazards associated with transportation. Chemical treatment is also more cost-effective as compared to disposal. In addition, off-site disposal site capacities are severely limited. As a result, new technologies addressing the contamination problem rather than relocating it are encouraged by EPA.

Table 23 summarizes the results of the evaluation of the remedial alternatives surviving the initial screening. Table 24 shows the implementation time and the capital, operation and maintenance, and present worth costs for the alternatives considered in the final screening.

## ALTERNATIVE EVALUATION MATRIX

| Evaluation Factors/Alternatives | No Action | Removal Chemical Treatment | Removal Landfill |
|---|---|---|---|
| **COST FACTORS** | | | |
| Capital Costs | 7.8 | 8.0 | 2.8 |
| Operation and Maintenance Costs | 6.8 | 9.0 | 9.0 |
| Monitoring and Postclosure Costs | 4.0 | 7.0 | 7.8 |
| **TECHNICAL FACTORS** | | | |
| Feasibility | 7.8 | 5.2 | 9.0 |
| Implementability | 5.5 | 5.5 | 7.8 |
| Time to Accomplish | 8.5 | 6.5 | 6.5 |
| Reliability | 5.5 | 5.8 | 9.0 |
| **HEALTH, WELFARE, AND ENVIRONMENTAL FACTORS** | | | |
| Reduction in Health Risk | 1.2 | 8.2 | 8.2 |
| Onsite Public Health Effects | 1.8 | 6.8 | 8.0 |
| Offsite Effects | 5.0 | 9.6 | 6.0 |
| Occupational Health Effects | 7.2 | 6.5 | 6.0 |
| Reduction of Environmental Impact | 2.2 | 8.0 | 8.5 |
| Environmental Effects | 2.8 | 7.0 | 7.0 |
| Institutional Factors | 3.5 | 6.2 | 7.5 |
| **OVERALL SCORE** | 70 | 99 | 103 |

Table 2 3

Implementation Time, Capital, Operation and Maintenance, and Present Worth Costs for Alternatives Considered in the Final Screening

| Alternative | Implementation Time (years) | Capital | O&M* | Present Worth* |
|---|---|---|---|---|
| | | ($ million) | | |
| 1. No action | >20 | 0 | 0.85 | 3.9 |
| 2. Excavate & dispose | 1-2 | 16.33 | 0.002 | 16.36 |
| 3. Excavate & treat | 1-3 | 8.8 | 0.002 | 8.82 |

* 20-year planning period, 10% discount rate O & M is assumed to escalate approximately 5% per year over the lenght of the planning period.

Table 24

Community Relations

Throughout the Field Investigation Team's investigation, the RI, FS, and the immediate removal action, all data and reports have been submitted to the president of the Homeowner's Association, who maintains a public repository.

After publicly releasing the draft RI report, an April 8, 1985 meeting was held to brief the public on the findings of the field investigation and to solicit public comment. The meeting was attended by 30 people. A three week public comment period ended on April 29, 1985.

After publicly releasing the draft FS a public meeting was held on August 29, 1985 to brief the public on the findings and to solicit public comment. The meeting was attended by 22 people. A three week public comment period ended in September.

The above meetings were held in the Brant Township Community Building. A responsiveness summary is attached as Attachment 1. This document includes the meeting notification documents and summarizes the comments on the FS.

Consistency with Other Environmental Laws

The recommended remedial alternative complies with all substantive requirements of the Resource Conservation and Recovery Act, the Clean Water Act, the Clean Air Act, and the Toxic Substances Control Act.

Recommended Alternative

According to 40 CFR part 300.68 (j), cost-effectiveness is described as the lowest cost alternative that is technically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, and the environment. Six source control alternatives were evaluated, three of which survived the initial screening.

The no-action alternative was found to provide inadequate protection of public health and the environment in addressing the threat from the contaminated soils and sediments at the site. However, since source removal will prevent releases to the ground water, and since particulate filters were installed in July 1985 on the private wells to protect the public in the interim, no further action will be required to protect the ground water. The perched water in the sewer trenches, however, should be treated. The excavation and landfill alternative is not recommended because not only is it significantly more costly than the excavation and chemical treatment alternative, but it will, for the most part, only relocate large quantities of PCBcontaminated soils.

The recommended source control alternative, on-site chemical treatment, provides a means of actively and significantly reducing the amount of contamination that remains on the site in a relatively simple and expeditious manner. In selecting this alternative, EPA has weighed the advantages and disadvantages of this approach, as well as the technical concerns associated with applying this remedy to the site. The primary concerns associated with this technology include the ability to attain the 10 mg/kg PCB level, as well as the potential formation of toxic end products.

While EPA recognizes these concerns and uncertainties associated with this remedy, the Agency feels there is sufficient reason to proceed with chemical treatment as the source control method because the potential benefits of this waste reduction method offset the potential disadvantages.

Should the proposed treatability study demonstrate that the selected remedy is ineffective in meeting the remedial response objectives, the Regional Administrator would, of course, be able to reconsider his selection of a remedy at this site.

The recommended alternative, the extent of which is illustrated in Figure 10, includes the following activities:

As a result of the pavement of the roads, ditches, and driveways at the site, an excavation of 5-10 cm of asphalt will be required.* Rotogrinders, jack hammer, scrappers or similar equipment can be used to remove the pavement. The asphalt will be reduced to a size convenient for efficient loading and as required by the ultimate disposal area, or will be reused if not contaminated.

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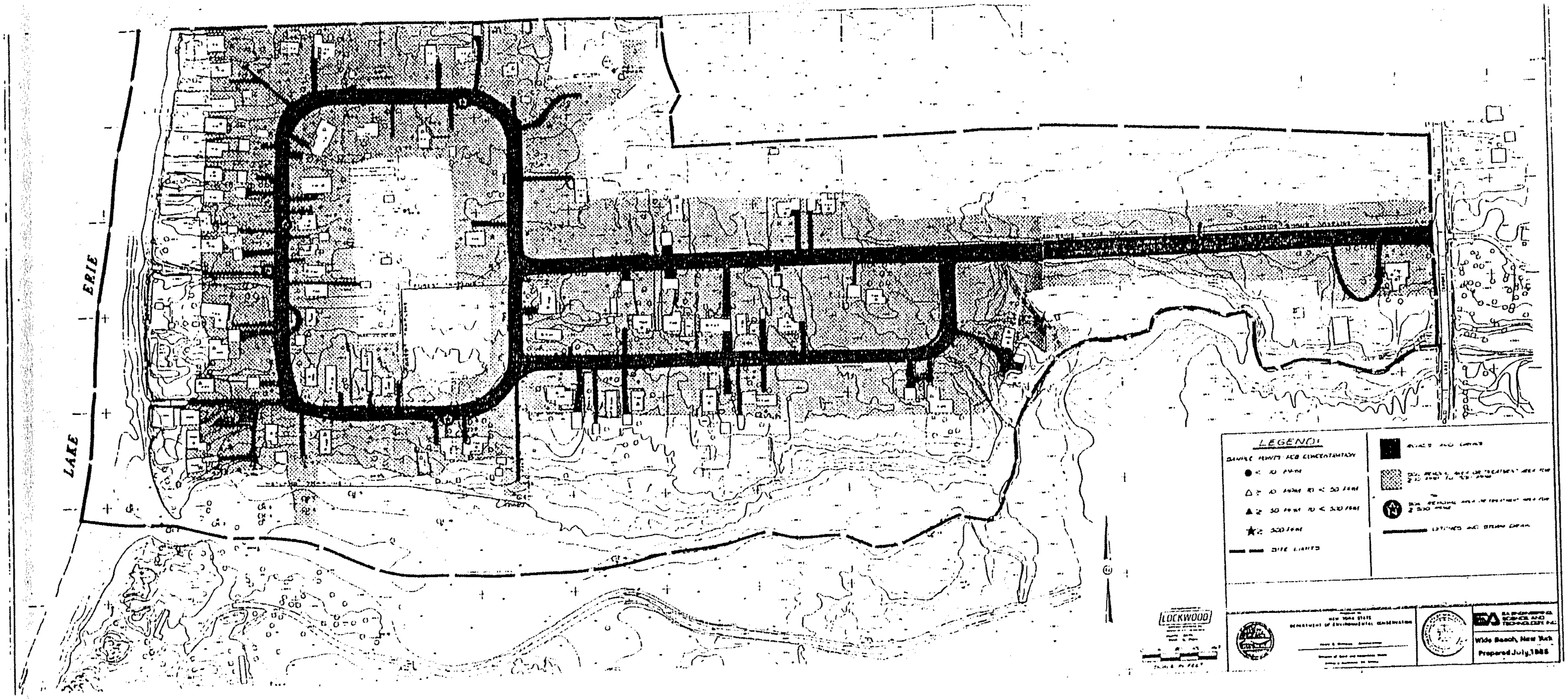
* See Site History section of the ROD for an explanation as to why this roadway was installed.




Remedial Alternative Site Plan

Figure 10

Soil excavation in the roadway will be conducted using a crawler dozer and a rubber-tired loader with a large volume (2-3 $m^3$) bucket. To remove all PCB-contaminated soils with concentrations greater than 10 mg/kg, excavation will be to a depth of approximately 0.5 m from the base of the existing asphalt roadway surface, yielding approximately 5600 $m^3$ of soil. Continuous soil sampling and on-site analysis will take place to determine the final depth of excavation.

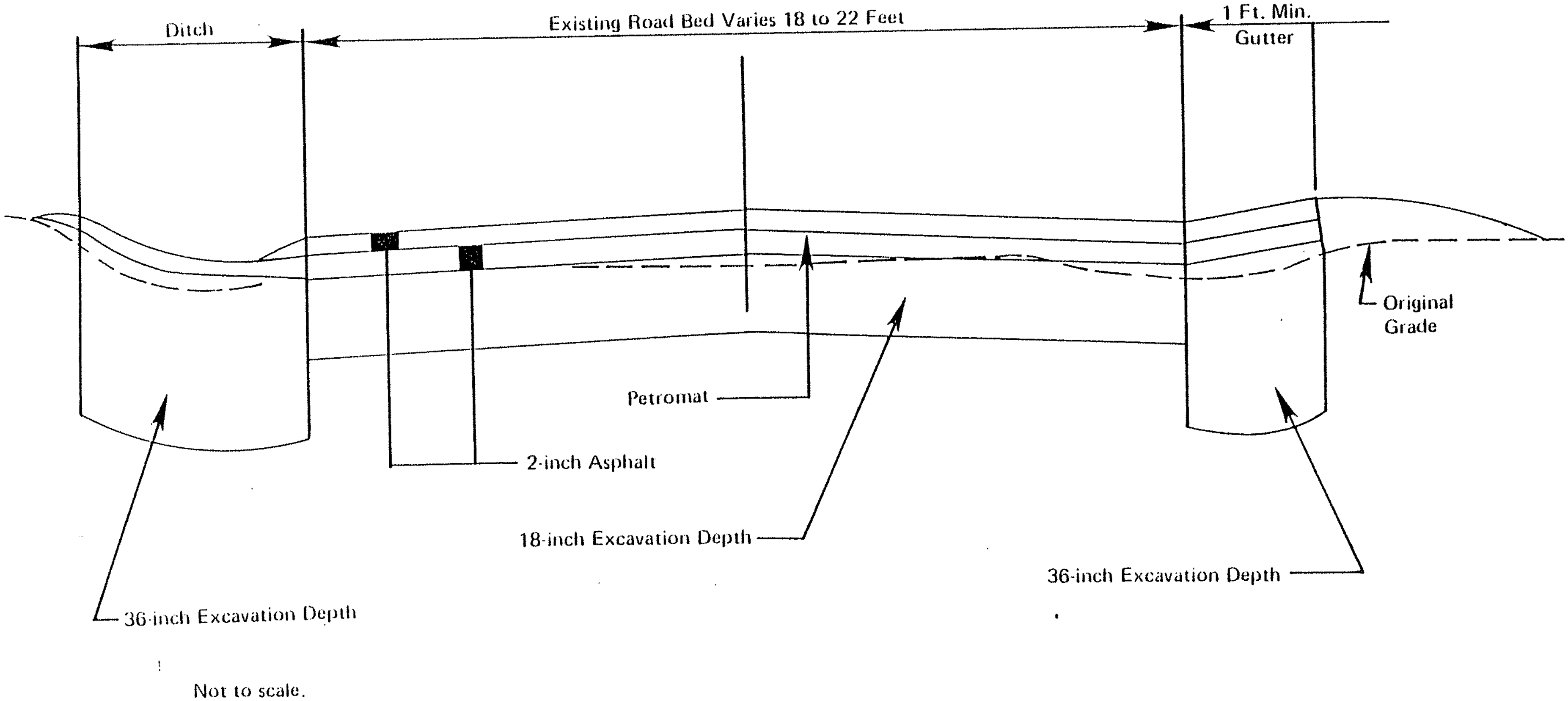
Due to the proximity of the roadway drainage ditches to the oiled roadways and the prevailing drainage patterns, to remove soil contaminated with PCB concentrations greater than 10 mg/kg the depth of contaminated soil is expected to require drainage ditch and storm drain excavation to a depth of approximately 1 m, yielding approximately 8500 $m^3$ of soil. Figure 11 shows the extent of the excavation activities required for the roadways and drainage ditches.

Thirty centimeters of soil, or 1500 $m^3$, will be removed from the 4300 $m^2$ of driveways to excavated all PCB-contaminated soils with concentrations greater than 10 mg/kg. Figure 12 illustrates the excavation activities proposed for the driveways.

To excavate all PCB-contaminated soils with concentrations greater than 10 mg/kg, the front yards and limited portions of the backyards and open lots will be excavated to a depth of approximately 15 cm, yielding approximately 13,000 $m^3$ of contaminated soil.

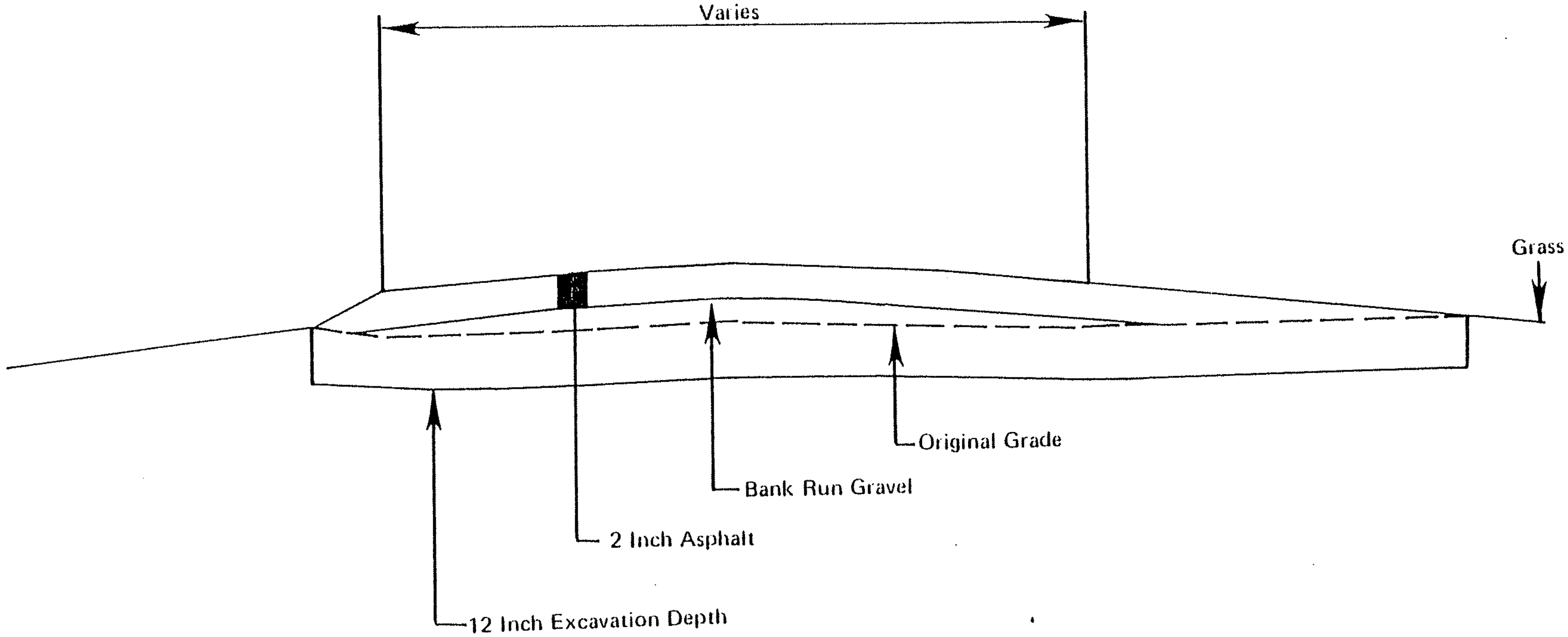
Trees and shrubs in the yards will be removed only when absolutely necessary to reduce contamination. Removal in certain areas will require clearing and grubbing. Large stumps, which are expected to retain a large percentage of soil on their root structures, will be excavated with a bulldozer and disposed of.

The removal of various lengths and sizes of drainage pipe is also anticipated. These pipes are to be considered contaminated and can be excavated and removed with the bulldozer and loader.




Excavation depth for roadways and ditches.

Figure 11




Not to scale.

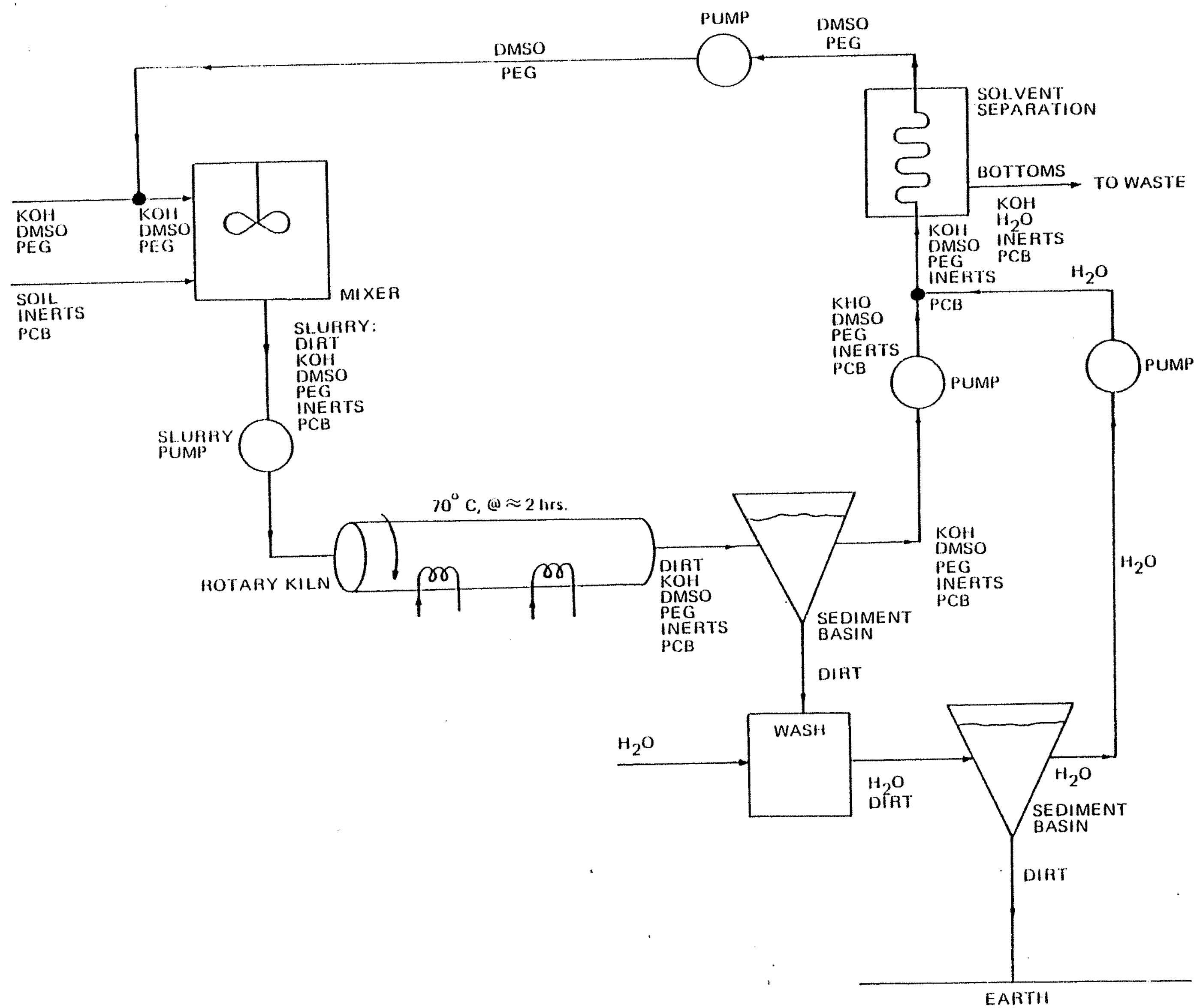
Excavation depth for driveways.

Figure 12

The existing sanitary sewer in the Wide Beach site consists of approximately 1380 m of gravity line and a 150-m section of force main. Due to the higher porosity of the fill material around the sewer, the sewer trench area represents a possible conduit for leaching contaminated water off-site. The perched water in the sewer trench has been found to have PCB concentrations up to 10 ug/l. The water will be extracted utilizing the shallow wells installed in the trench, and subsequently will be treated using granular activated carbon. The soil surrounding the sewer line will be extracted and treated. A hydraulic barrier will be constructed in the sewer trench to prevent the future off-site transport of any residual contaminated ground water.

The wetlands do not contain large areas of contaminated soils. Areas identified as having contamination are those found at the storm drain outlets, the discharge points for much of the sitewide roadway runoff. By excavating to a depth of approximately 20 cm, approximately 150 $m^3$ of contaminated sediments with PCB concentrations greater than 10 mg/kg, will be removed. Clearing and grubbing may be necessary prior to excavation.

The excavated soil from the roadways, drainage ditches, driveways, yards, open lots, and wetlands would be fed into a continuous chemical treatment reactor (see Figure 13). A heat source would remove any inhibitory water from the slurry during detention and accelerate the reaction. Soil would be continuously charged to a mixer by a backhoe. In the mixer, the contaminated soil would be slurried with reagents and then would be pumped to a rotary kiln where it would be heated to about 100°C for a detention time of two hours. After reacting, the decontaminated solids would be separated from the reagents by sedimentation. The solids would then be water-washed and separated. Water washings would be combined with used solvent, and the solvent separated. The purified solvent would be recycled to the mixer while the bottoms would go to waste. The treated soils would then be fertilized and returned as fill for the excavated locations. The roadways and driveways would be regraded and paved and the excavated storm drains would be replaced.




Continuous KPEG process.

Figure 13

Because the excavation activites will generate significant levels of dust over the site, house decontamination, including the same cleaning activities undertaken under the immediate removal action, would be undertaken once the remedial activities have been completed.

Table 25 represents cost estimates for the recommended remedial actions. The total required amount for the treatability study and design ($500,000) and the construction ($8,795,000) of this measure is $9,295,000, of which EPA will fund $8,415,500.

## Operation and Maintenance

Upon completion of the chemical treatment remedial alternative proposed for this site, other than maintaining the new road surfaces the only operation and maintenance requirement will be continued monitoring of the site to evaluate the effectiveness of the remedy. This monitoring will include periodic sampling of the ground water, surface water, and residential vacuum cleaner dust. It is anticipated that the treatment associated with the sewer trench perched water will be a short-term action.

Two vacuum cleaner samples will be collected at random, annually. Twelve drinking water samples will be collected annually so that all of the homes are sampled during a 5-year period. Ten catch basin samples will be collected each time they are emptied (every three years). Runoff samples will also be collected.

## Schedule

| Activity | Date |
|---|---|
| - RA Approval of ROD | September 30, 1985 |
| - Amend Cooperative Agreement for Design | September 30, 1985 |
| - Solicit Design/Treatability Study Proposals (State) | November 30, 1985 |
| - Award Contract for Design/Treatability Study (State) | March 31, 1986 |
| - Start Pilot Treatability Study | April 1, 1986 |
| - Complete Pilot Treatability Study | August 31, 1986 |
| - Start Design | September 1, 1986 |
| - Complete Design | March 31, 1987 |
| - Solicit Construction Proposals (State) | June 1, 1987 |
| - Award Contract for Construction (State) | October 1, 1987 |
| - Start Construction | April 1, 1988 |
| - Complete Construction | April 1, 1990 |

## CAPITAL COSTS FOR EXCAVATION, TREATMENT, AND REPLACEMENT

| | Excavation | Disposal | Treatment | Replacement | Total |
|---|---|---|---|---|---|
| Roads | $ 40,000 | $ 380,000 | $ 980,000 | $ 200,000 | $ 1,600,000 |
| Driveways | 10,000 | 98,000 | 132,000 | 50,000 | 290,000 |
| Ditches/storm drains | 100,000 | 10,000 | 2,310,000 | 130,000 | 2,600,000 |
| Front yards | 150,000 | 0 | 2,900,000 | 350,000 | 3,400,000 |
| Back yards | 3,000 | 0 | 25,000 | 2,000 | 30,000 |
| Fill areas | 3,500 | 0 | 146,000 | 10,000 | 160,000 |
| Wetlands | 2,500 | 0 | 60,000 | 2,500 | 65,000 |
| Subtotal | 309,000 | 488,000 | 6,553,000 | 744,500 | 8,145,000 |
| Additional remediation (cleaning, perched water treatment) | | | | | 650,000 |
| | | | | | $ 8,795,000 |

Table 25

## Future Actions

In order to design a viable treatment scheme for addressing the PCB-contaminated sediments and soils that will be excavated under the recommended alternative, a pilot plant treatability study will be undertaken to determine an effective treatment scheme for neutralizing the PCB-contaminated soil.

Other future actions include sampling and analysis of the backyards during design, since only limited data are available from these areas.

The community was required to connect to a sanitary sewer system in 1980. Because the septic tanks would have received PCB-contaminated soils from laundry, bathing, and house cleaning activities, any overflow or releases from the systems may pose a threat to the aquifer. Tank sediments from 20 of these septic tanks will be sampled for PCBs.

Two 24-hour composite samples will be taken from the sewage lift station to determine whether laundry, bathing, and house cleaning, as well as infiltration, is contributing contamination to the sewage system.

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from EA Engineering Science and Technology
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August 1985

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Responsiveness Summary

Attachment 1

File

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

COPIES OF THIS LETTER SENT TO THE ATTACHED LISTING

Henry G. Williams
Commissioner

August 3, 1984

Dear

A contract has been signed between the New York State Department of Environmental Conservation and EA Engineering, Science and Technology, Inc. of Middletown, New York to conduct a Remedial Investigation/Feasibility Study at Wide Beach. This activity will result in a plan to correct the current presence of PCB's in your soil which was verified some three years ago by Erie County.

A meeting to fully explain what the consultant will be doing during the study, why he will be doing it, and how you can assist in their effort will be held on Thursday, August 9, 1984 at 7:00 p.m. in the Brant Town Park Community Center on the Brant/North Collins Road (Route 249). Your input, thoughts, and assistance on this project are sincerely desired.

Yours very truly,

Charles W. Kollatz
Citizen Participation Specialist
Region 9

bcc: P. Buechi
B. Bentley
C. Kollatz
F. Ricotta
G. Kerzic

# TOWN of BRANT
## 8 - 9 - 84

**RE: WIDE BEACH**

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| 2. BILL HARRIS | BALTIMORE, MD | " " |
| 3. Doug Cordell | Balt. MD. | EA ES&T |
| 4. DAVID G HEALEY | EASTHAMPTON MA | TIGHE & BOND INC |
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| 14. Mary C. Mueller | 7 South Wide Beach Rd | Wide Beach |
| 15. Peter M. Mueller | 7 South Wide Beach Rd | Wide Beach |
| 16. Herbert J. Hellman | 2 South Wide Beach | Wide Beach |
| 17. John Gerlach | 81 Wide Beach Road | Wide Beach |
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| 19. Fred & Janice Hansen | 4? Wide Beach | |
| 20. Dr. Matt [illegible] | 1021 Main St. Buffalo | ECHD. |
| 21. Frank J. Militello | 20 Wide Beach | |
| 22. Jerry Newman | 30 Wide Beach | |
| 23. Matt Novlich | 34 Wide Beach | |
| 24. Robert Oehler | 157 O. Rd Wide Beach | |
| 25. Ron Meyers | 171 Wide Beach | |

WB-2

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| 33. Bruce Lyford | 10870 Old Lake Shore | |
| 34. [illegible] | 48 Wide Beach | |
| . . Marian Mason | 85 Wide Beach oval | |
| 36. Florence Cantelino | 18. Wide Beach Rd | |
| 37. Ellen Marcy | 18 Wide Beach Rd | |
| 38. Roger [illegible] | Erie County DEP, 95 Franklin | |
| 39. Doris Bowen | 9 Wide Beach | |
| 40. Terry Tymczuk | " " | |
| 41. William Pricano | Town of Brant Sup. | |
| 42. Elizabeth Murphy | 166 Vermont St Buffalo | |
| 43. Stephen [illegible] | 204 Cable St Bflo 14206 | |
| 44. Arlene B. Gajewski | Wide Beach | |
| 45. Adrienne [illegible] | " | |
| 46. Susan Mitchell | 76 Wide Beach | |
| 47. Howard Holcomb | 64 Wide Beach | |
| 48. Don Campbell | ECDEP | |
| 49. Rita Burke | Snyder Beach | |
| 50. Ed Redmond | " " | |

WB #3

| NAME | ADDRESS | AFFILIATION |
| --- | --- | --- |
| 51. Persichini | Wide Beach | |
| 52. Harold Grabenstatter | 1 Oval White Beach | |
| 53. | | |
| 54. | | |
| 55. | | |
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New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

Henry G. Williams
Commissioner

March 15, 1985

Dear Interested Party:

The New York State Department of Environmental Conservation will be holding a public informational meeting on April 8, 1985 at 7:00 p.m. at the Brant Town Park Community Facilities Building. The purpose of the meeting is to summarize the findings of the remedial investigation performed, to determine the extent of hazardous waste contamination at the Wide Beach Development.

All interested persons are invited to attend to express their concerns or questions.

Sincerely,

Gary T. Kerzic
Project Engineer
Bureau of Eastern Remedial Action
Division of Solid & Hazardous Waste

# WIDE BEACH MEETING

TELEX TO: GARY KEREIC
REMEDIAL ACTION
— ALBANY —
4/9/85

APRIL 8, 1985
7 PM
BRANT COMMUNITY CTR

| NAME | HOME/MAILING ADDRESS | TELEPHONE # |
|---|---|---|
| Mary Mueller | 301 Forbes Ave, Tonawanda 14150 | 694-0667 |
| Peter Mueller | 301 Forbes Ave. Tonawanda N.Y. 14150 | 694-0667 |
| Tom Rusch | 3 S. Wide Beach Rd. ~~Irving~~ Brant N.Y. | 549-4191 |
| Ellen Maury | 18 Wide Beach Rd Irving N.Y. | 549-5125 |
| Florence Cantaline | 18 Wide Beach Rd Irving N.Y. | 549-5123 |
| Liz Murphy | 16 C Vermont St Buffalo N.Y. | 882-1073 |
| NORMA E. MURPHY | 10 MONTAUK HWY BLUEPOINT N.Y. 11715 | (516) 363-6970 |
| Mr & Mrs Newman | 30 Wide Beach | 549-0268 |
| Herbert G Hellman | 2 South Wide Beach | 549-4042 |
| Fred Hansen | 43 Wide Beach | 549-0729 |
| Bruce Lyford | 10870 Old Lake Shore | 549-4508 |
| Jerry & Bev Collins | 107 Wide Beach | 5490598 |
| Art Mason Jr. | 85 Wide Beach | 549-5799 |
| Angelo S. Mitchell Jr. | 60 Wide Beach | 549-3566 |
| Frank J. Mitchell | 20 Wide Beach | 549-4078 |
| Frank Kelly | 27 Randolph Bflo NY | 893-5270 |
| Rosemary Morganti | 5857 Old Lake Sh. Athol Springs | 627-7518 |
| Linda Roe | 11 Wide Beach | 5494883 |
| Wm. Fricano | Town of Brant | 549-0301 |
| Rose Marie DeMaria | Town of Brant | 549-0282 |
| Dori Bowen | 9 Wide Beach | 549-5360 |
| Terry Tymczuk | " | " " |
| Rev. B. March | 95 WIDE BEACH | 549-4397 |
| H. W. Holman Jr. | 69 Wide Beach | 549-2558 |
| Pat Murphy | 108 Wide Beach | 549-485 |

Remedial Action
— Albany —
4/9/85

2

# Wide Beach

April 8, 1985
7 PM

Mrs John Lundberg Wide Beach 549-2390
Larry A. Militello 76 Wide Beach 549-4736
Charmaine G Burke 21 Wide Beach. 549-0387
[illegible] Burke 21

\+ Mary Lou Fleissner — ECHD Epidemiologist
Dr. Donald Thomas — ECHD Health Commissioner
John Kociela — ECHD Env. Health
Anthony Voell — ECDEP Deputy Commissioner
Louis Violanti — NYS DOH - Buffalo
Wm. Trask — EC Dept of Law

# Responsiveness Summary

## Wide Beach Development Site
## Draft Remedial Investigation

April 1985

This summary is in response to comments and questions raised by the public at an informational meeting held on April 8, 1985 at the Brant Community Building. The meeting was held to present the findings of the Draft Remedial Investigation prepared by EA Engineering, Science and Technology, Inc. (EA) for the New York State Department of Environmental Conservation (NYSDEC). Enclosed is a copy of the handout which was distributed to all those attending the meeting. It summarizes the major findings of the Remedial Investigation. Also enclosed is a pamphlet prepared by the New York State Department of Health on PCB's.

The following is a summary of the comments and replies that were discussed at the meeting.

COMMENT: How much contamination did you (NYSDEC) find?
RESPONSE: Levels of contamination were found to be the same as those from studies done in previous years by the Erie County Department of Environment and Planning and the United States Environmental Protection Agency. This study was more encompassing than the previous studies, so contamination was found to be more widespread.

COMMENT: How can PCB's still be present at Wide Beach?
RESPONSE: PCB's are very stable compounds. They are not readily broken down under normal environmental conditions (i.e. sunlight, heat, moisture, etc.) so they tend to linger in the environment for long periods. Additionally, PCB's have a strong affinity to soil, which means they tend to adhere to soil particles and are not readily broken away.

COMMENT: What is the health hazard to living at Wide Beach?
RESPONSE: There is not definitive information available on human health effects due to PCB exposure. Exposure to the PCB levels present at Wide Beach is probably not an acute situation. It is uncertain as to what, if any, will be the effect of long-term chronic exposure.

PCB exposure is an additional burden to the human body. Any such burden is undesirable and should be minimized as much as possible.

Due to the uncertain human health effects from PCB exposure, the following actions will be taken to minimize exposure until a long-term remedial action plan can be developed and implemented.

1. Roadway Dust Control - This will involve the application of a dust suppressant to prevent the movement of PCB contaminated soil from the roadways, driveways and drainage ditches.

2. Residential Cleaning - Thorough commercial cleaning of the interiors of all homes and garages.

3. Drinking Water Filters - Installation of particulate filters on all drinking water supplies.

4. Educational Program - Instruction in ways to minimize human exposure and to reduce further contamination to personal property.

The implementation of these interim remedial measures will take place in the near future, as early as May 1985. The first three actions will be undertaken by the USEPA. The educational program will be developed by EA and will be implemented during the summer months when the majority of Wide Beach residents are present.

COMMENT: Where is the money coming from to pay for all the work being done at Wide Beach?

RESPONSE: Funding is being made available through the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The Remedial Investigation/Feasibility Study will cost approximately $350,000 when completed. The interim remedial measures stated earlier will also be CERCLA funded. The cost for this is unknown at this time.

Following completion of the Remedial Investigation/Feasibility Study, the NYSDEC will undertake a detailed remedial design followed by remedial implementation. Funding for these steps will also come from CERCLA, provided funding is authorized by the U.S. Congress in future fiscal years.

Using the findings of the Remedial Investigation, EA is presently developing a feasibility study. This study will identify and evaluate all possible long-term remedial action options. The feasibility study will be available for review in July 1985. A public informational meeting will be held to discuss the feasibility study. Public input to the feasibility study as well as the remedial investigation is welcomed and encouraged. If you have any questions or concerns which were not addressed, please contact Gary Kerzic, Project Engineer, at 518/457-5677 or call our toll free telephone line 800-342-9296.

File

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

Henry G. Williams
Commissioner

July 1, 1985

COPIES OF LETTER SENT TO ATTACHED LISTING

The New York State Department of Environmental Conservation will be holding a public informational meeting on July 8, 1985 at 7:00 p.m. at the Brant Town Community Building.

The purpose of the meeting is to provide residents with instruction on preventing unnecessary exposure to soils containing PCBs at Wide Beach. The presentation will be given by EA Engineering, Science and Technology, Inc. who will be available on July 9 at Wide Beach for individual discussion with interested residents.

Sincerely,

Gary T. Kerzic
Project Engineer
Bureau of Eastern Remedial Action
Division of Solid & Hazardous Waste

GTK/bhy

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

1885 N.Y.S. Forest Preserve Centennial 100

Henry G. Williams
Commissioner

August 21, 1985

COPIES OF LETTER SENT TO ATTACHED LISTING

The New York State Department of Environmental Conservation (NYSDEC) will be holding a public informational meeting on August 29, 1985 at 7:00 p.m. at the Brant Town Park Community Building.

The purpose of this meeting is to present the results of the Feasibility Study performed by EA Engineering, Science and Technology Inc. for the NYSDEC regarding the hazardous waste contamination at the Wide Beach Development.

A copy of the draft Feasibility Study is available for public review at the home of Arthur Mason, 85 Wide Beach Oval and at the NYSDEC Regional Office, 600 Delaware Avenue, Buffalo.

Sincerely,

Gary T. Kerzic

Gary T. Kerzic
Project Engineer
Bureau of Eastern Remedial Action
Division of Solid and Hazardous Waste

GTK/bhy

GTK/bhy
bcc: F. Ricotta
J. Feron, Region 9
C. Kollatz, Region 9
G. Kerzic

# WIDE BEACH FEASIBILITY STUDY MEETING

8/29/85 7PM

Herbert G Hellman 7 South Wide Beach
Angelo G Militello 60 Wide Beach
~~Harold Grabenstatt~~ 1 Oval
Rosemary Morgante 29 Oval X
Mr & Mrs Louis Newman 30 Wide Beach
Dr & Mrs Robert Oehler 107 Oval Wide Beach
J. Hansen 43 Wide Beach
Max Schultz 45 Wide beach
Sean Morrisso Deputy Supervisor
Tom + Elsie Rusch 3 S Wide Beach Rd.
Louella E Hickey + Robert Hickey
Frank + Jane Plonk Wide Beach Oval
Frank Kelling 86 Wide Beach Oval
Marian E Frantz 78 Wide Beach Oval
Ana Allen 59 Wide Beach
Ellen Marcy 16 Wide Beach
Terry (Powers) Wide Beach
Peter Buechi NYS DEC Buffalo
Edward J Feron Jr. NYSDEC Region IX
Charles W. Kollatz NYSDEC Region 9

## RESPONSIVENESS SUMMARY

Wide Beach Development Site
Feasibility Study

September 1985

The New York State Department of Environmental Conservation (NYSDEC) held a public informational meeting on August 29, 1985 at the Brant Community Building to present the results of the Feasibility Study prepared for the NYSDEC by EA Engineering, Science and Technology, Inc. This summary is in response to comments and questions raised by the public regarding the Feasibility Study.

Before the question and answer period, a presentation was given to briefly summarize the Feasibility Study. The Feasibility Study shows that the most cost-effective and environmentally acceptable means of remediating the site is to chemically destroy the PCBs on site. This will involve excavating the contaminated soil, processing it through a treatment plant, after which the soil will be returned to its original location.

The following is a summary of the comments received as of September 20, 1985 and the response to those comments.

Comment: With the time and money spent to date, what has been accomplished?

Response: The studies performed to date have defined the extent of PCB contamination within and leaving the site. The Remedial Investigation compiles all the information gathered to date and gives an evaluation of this information.

Comment: How deep is the PCB contamination? How deep will you excavate?

Response: The PCB contamination is mainly in the upper 6 inches of soil in the roadways, driveways and yards. The contamination in the sewer trench is on the order to 2 to 3 feet deep. The excavation of soil in the roadways will be to a depth of 18 inches, the driveways to 12 inches and the drainage ditches to 36 inches. The sewer trenches will be excavated to the depth of the sewer line to remove all contaminated soil that was used to backfill the trench during sewer installation.

Comment: If the drinking water wells were not found to be contaminated, why were filters placed on the wells?

Response: The filters were placed as a precaution. The cost of the filters was minor and worth the expense for the benefits received.

Comment: How are you going to test for PCBs under the road?

Response: The soil under the newly placed roadway pavement has been sampled previously. The pavement will be removed, and the soil excavated for treatment. Sampling will be done after the specified depth of soil is removed to determine if more should be removed.

Comment: Must the soil be removed in order to treat it?

Response: We have investigated processes for in place or in situ treatment. The effective destruction of the PCBs requires the application to heat to remove excess water and to enhance the reaction. The addition of heat to the soil while it is in place would be very difficult, therefore, we plan to construct a treatment plant. The soil will be brought to the treatment plant, tested and then replaced.

Comment: During removal of the soil, dust will be kicked up, will we be in danger from the contaminated dust?

Response: Precautions will be taken to minimize dust. The dust suppression steps to be used will be decided during the design process. Air monitoring will be done during this removal action. The necessary steps will be taken to protect the public health. Following the removal and treatment of the soil, your homes will again be cleaned as they were recently, following the paving.

Comment: How long will this removal action take?

Response: Two to three years.

Comment: Wouldn't it be less expensive for the government to just buy our homes?

Response: Buying your homes and relocating all Wide Beach residents would not achieve our ultimate goal of removing the contaminants from the environment. The contamination is not extensive enough to warrant complete encapsulation of the site. The levels of contamination are not high enough to create an acute health hazard. We believe that chemical destruction of the PCBs is feasible and cost effective.

Comment: Can we save our garden plants and replant them after the soil is treated?

Response: All vegetation has the potential for being contaminated. As a precaution, the vegetation will have to be removed and treated as if it is contaminated. Following treatment of the soil, the site will be revegetated to as near its original state as possible.

Comment: Articles in the newspaper say that there is no Superfund money available for Wide Beach.

Response: It's true that the Federal Government has not appropriated funds for the next fiscal year. We don't expect the delay to be too long. It is a matter of the President and Congress coming to an agreement on Superfund legislation.