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SCREENING SITE INVESTIGATION

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OF .

CENTRAL CHEMICAL CORPORATION

HAGERSTOWN, MD

MD - 302

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# 1.0 INTRODUCTION



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1.1 AUTHORIZATION

The Maryland Department of the Environment, Hazardous and Solid Waste Management Administration (MDE/HSWMA) performed this study under the United States Environmental Protection Agency (U.S. EPA) Contract Number MD88-0526-0408.

1.2 SCOPE OF WORK

MDE/HSWMA was contracted to perform a Screening Site Investigation (SSI) at the subject site using available information. The purpose of this study is to present and discuss groundwater, surface water and soil contamination found on- and off-site through earlier sampling conducted in the vicinity of the site. This information will be used in evaluating the relative potential of the site to cause human health/safety problems or ecological/environmental damages. If the site does not meet the criteria to be recommended for a Listing Site Inspection (LSI), it will be evaluated for further assessment and possible clean-up under the State Superfund Program.

#### 1.3 EXECUTIVE SUMMARY

In June 1976, DDT was found in sediments of Antietam Creek by the EPA during a follow-up of routine sampling by the United States Geological Survey (U.S.G.S.). The occurrence of DDT was traced to the Central Chemical Corporation, indicating that the contaminant had migrated off-site.

As a result of the discovery of DDT in Antietam Creek, Central Chemical Corporation was the recipient of a Complaint and Order issued by the Maryland Water Resources Administration in 1977. The company was ordered to have an extensive hydrologic survey performed and to execute a plan which would contain or remove contaminants in the ground and prevent any discharge to waters of the State. The company opted to contain the contaminants through vegetative stabilization and a Notice of Compliance was issued in December 1979.

Central Chemical Corporation was again brought to the attention of MDE/HSWMA in March 1987 as the result of a complaint concerning a chemical dump discovered during excavation for a sewer line. Central Chemical Corporation was placed on CERCLIS as a result of the discovery of that dump.

Central Chemical Corporation processed pesticides for approximately 20 years. When chemicals were no longer needed,

they were disposed of on the site: soluble wastes were placed in a sinkhole which has since been filled and insoluble wastes were buried, some in the chemical dump which was disturbed by the excavation. The exact amount of chemicals disposed of in the sinkhole and dump are not known, but one former employee states that "hundreds of boxcar loads" of raw DDT were buried in trenches and many types of soluble waste were disposed of in the sinkhole.

In karst topography, which is present at this site, when soluble waste is disposed of in a sinkhole, there is a very high probability that the contaminants will enter the groundwater system.

Sample results indicate the presence of volatile organic compounds (VOCs), semi-volatile organic compounds, heavy metals and pesticides. The results of groundwater samples collected in 1988 and 1989 revealed the presence of DDT, chlorobenzene, benzene, dichlorobenzenes, trichloroethene, arsenic and endrin above proposed or current federal standards for those contaminants in drinking water.

The results of soil samples collected from 1976 to 1989 revealed the presence of DDT, lead, arsenic, chromium, methoxychlor, lindane, chlordane, dichlorobenzenes, benzene, chlorobenzene, tetrachloroethene, pentachlorophenol and endrin.

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Contaminants found in the groundwater have the potential to affect the health of residents using groundwater for drinking water. Contaminants found in sediments in a storm water drain inlet and in Antietam Creek indicate that those contaminants have migrated off-site and may pose a threat to aquatic organisms. Based on the evaluation of the history of the site and the contaminants found in the soil and groundwater, the Central Chemical Corporation site is recommended for a high priority Listing Site Inspection (LSI), and MDE wilt prepare a work plan-to address the above concerns.



2.0 THE SITE



### 2.1 SITE LOCATION

Central Chemical Corporation is located on Mitchell Avenue in Hagerstown, Maryland, in the northeastern section of Washington County. The site is reached by taking Md Route 40 West to Franklin Street to McPherson Street to Salem Avenue (MD Route 58) to Mitchell Avenue. Follow Mitchell Avenue under the railroad tracks and Central Chemical Corporation will be on the left (See Figures 1 & 2).

Coordinates for the site are  $39^{\circ}$  39' 23" N latitude and  $77^{\circ}$ 43' 81" W longitude.

2.2 SITE LAYOUT

Central Chemical Corporation was a pesticide and fertilizer manufacturing plant. The site is bordered on the southwest by Penn-Central Railroad, beyond which are residential areas; on the southeast by Mitchell Avenue, beyond which is the New York Central Ironworks property; on the northwest by a wooded lot, owned by Bester-Long, Inc.; on the north by a new residential development; and on the northeast by a shopping center and wooded lots, owned by Garland E. Groh.

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The site consists of 19.022 acres. Warehouses and old building foundations occupy approximately one half of the site on the west side. A sinkhole, filled and regraded, is located south of the old maintenance shop. A refuse dump is located to the northeast of the pesticide formulation building (See Figure 2). It is believed that trenches were excavated to the east and northeast of the filled sinkhole, filled with chemical wastes and then covered over.

### 2.3 OWNERSHIP HISTORY

Central Chemical Corporation purchased the property from Franklin M. and Grace Howard Thomas on May 12, 1937, according to the land records of Washington County: Liber 204, Folio 100.

# 2.4 SITE USE HISTORY

Central Chemical Corporation was constructed sometime in the early 1930's. From that time until 1965, the plant primarily functioned as a job blender of agricultural pesticides. The company blended materials such as DDT, Sevin, TDE and chlordane with certain types of clay. The grinding and blending was accomplished using air and hammer mills and wetting agents, followed by dry packaging of the material. "Guthion", a pesticide and organic phosphate, was blended at the plant and caused nuisance odor problems in areas around the plant.

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"Daconil" (tetrachloroisophthalonitrile), a fungicide and "Omite", an insecticide, were also processed at the plant.



In 1965, a fire destroyed the pesticide manufacturing building and those operations ceased. In 1968, the plant began to process fertilizers, blending mixtures containing potash, superphosphate, ammonium sulfate and nitrogen solution. This process was discontinued in 1984, and the buildings are currently rented as a paper warehouse.

2.5 PERMIT AND REGULATORY HISTORY

In 1970, a small dump was found, outside the company fence, by Maryland Department of Water Resources personnel which contained standing septic water and bags of pesticides. The Washington County Health Department (WCHD) subsequently required elimination of the dump.

From 1962 until 1972, numerous complaints were filed against Central Chemical Corporation for nuisance odors and visible emissions from the plant. A Plan for Compliance was developed for Central Chemical Corporation by the Division of Air Quality Control and went into effect on April 30, 1971. The Plan for Compliance was complete by February 14, 1972. Records for this time are incomplete, but it is believed that the meeting of the conditions for compliance did not adequately control the

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emissions and that it was more economically feasible to shut down the plant than to purchase additional emissions control

In June 1976, the U.S. EPA discovered concentrations of DDT in sediment samples along Antietam Creek, the highest concentrations being found where Marsh Run enters Antietam Creek. Through follow-up sampling by Maryland Water Resources Administration personnel, the presence of DDT, as well as arsenic and lead, was traced to Central Chemical Corporation.

A Complaint and Order (C-077-432) was issued to Central Chemical Corporation in February 1977, stating that a pollution violation had occurred and ordering that an hydrologic investigation be performed as well as a plan for preventing contaminant migration. Supplemental Orders (C-0-77-432 A, B and C) added that contamination be prevented from discharging to the waters of the State.

Between November 1977 and November 1979, the site was visited by Water Resources Administration personnel ten times in order to gauge the progress of stabilization work required by the Plan for Compliance. A Notice of Compliance was issued on December 14, 1979.

In March 1987, an on-site chemical dump was discovered

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during the excavation of a trench for a sewer line. As a result of this incident, the site was placed on the Comprehensive Environmental Response, Compensation and Liability Information Systems (CERCLIS) list. Samples taken at the time the trenching activities uncovered the dump revealed the presence of several pesticides, naphthalene, and volatile organic compounds. MDE/HSWMA requested that Central Chemical Corporation conduct a site evaluation to determine the impacts of these chemicals on the soil and groundwater.

Mr. Earl Faith, a former employee of Central Chemical Corporation spoke with MDE /HSWMA personnel on January 20, 1989 about the burying of chemicals on the site. Large amounts of chemicals were buried in trenches and soluble wastes were disposed of in a "quarry". The area indicated by Mr. Faith as a "quarry" coincides with the area on Figure which is labeled "filled and regraded sinkhole."

On March 9, 1989, the site was visited by MDE/HSWMA personnel for the purpose of performing a preliminary assessment. Dumping areas containing auto parts and miscellaneous trash were visible beneath a light layer of snow. Orange flags indicating the location of the borings were also visible.

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#### 2.6 PREVIOUS STUDIES

2.6.1 BAKER & WIBBERLY - HYDROLOGIC AND SOIL INVESTIGATION

The first study was performed in April 1977 to comply with the State of Maryland Water Resources Administration's Supplemental Order C-0-77-432A. The study was the result of DDT, lead and arsenic being found in sediments of Antietam Creek in 1976. The study involved a hydrologic and geologic evaluation of the site and included the drilling of test borings and the collection of groundwater samples both on and off site. The contaminants of concern in this study were lead (Pb), arsenic (As) and DDT. It was concluded that "the underlying clay strata has retained the lead, arsenic and DDT". As a result of this study, and a Consent Agreement with the State of Maryland, Central Chemical closed its refuse dump located to the northeast of the pesticide formulations area in 1978.

## 2.6.2 ROY F. WESTON - ENVIRONMENTAL INVESTIGATION

The site remained closed until 1987 when a trenching operation performed by and adjoining property owner (to install a sewer line) encountered part of the closed dump. MDE was informed of the event and an inspector collected samples for analysis prior to the contractor backfilling the trench. According to the results of the analyses, several pesticides,

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naphthalene and volatile organic compounds were present. As a result, MDE requested that Central Chemical conduct a site evaluation to determine the impacts of these chemicals to the soil and groundwater beneath the site. The scope of work agreed upon between the State and Central Chemical in July 1988 included performing: 1) an historical review of past practices at the site, 2) a fracture trace analysis, 3) soil borings to auger refusal and 4) installation of four (4) monitoring wells. In addition, the State requested that upon completion of this phase, and following a review of the data, that the use of soil gas techniques and electromagnetic conductance, specifically EM-31, be performed if the data supported the use of these methodologies.

In October 1988, five borings were drilled at the site by Roy F. Weston, Inc., with an MDE representative present. An OVA meter was used on-site to monitor the borings. Grab water samples were also taken at borings BH-2 and BH-5 and analyzed for volatile organic compounds. The highest reading was encountered in BH-2 at 100 ppm. The results (Table ) show low levels of 1,1dichloroethane, trans-1,2-dichloroethene, chloroform, and trichloroethene. However, chlorobenzene was present at 651 ppb, above the State drinking water standard of 50 ppb, as well as benzene at 45 ppb, above the U.S. EPA Maximum Contaminant Level of 5 ppb. Toluene, ethylbenzene and xylene were also found; using EPA Method 601, 1,2-dichlorobenzene and 1,4-dichlorobenzene

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were estimated.

A second grab sample was collected from the water in BH-5. The results here were consistent with BH-22 (Table ), with chlorobenzene and benzene exceeding drinking water standards. Also, 1,2-dichlorobenzene and 1,4-dichlorobenzene were estimated at 820 ppb and 340 ppb respectively.

The borings were drilled as deep as thirty-six (36) feet and encountered black material, yellow powder, black and gray waste material, green seams, black and gray silt and clay, brown sand and silt and white powder. Strong petroleum odors were noted during the drilling. Analysis of the soil samples (dated March 23,1989) revealed the presence of:

acetone	- 0.11 ppm
chloroform	- 0.002 to 0.013 ppm
tetrachloroethene	
_	- 0.007 ppm
benzene	- 0.005 to 0.036 ppm
toluene	- 0.003 to 0.031 ppm
chlorobenzene	- 0.034 to 4.6 ppm
	- 0.005 to 9.2 ppm
o&p-xylene	- 0.009 to 7.5 ppm
1,3-dichlorobenzene	- 0.006 to 12 ppm
1,2-dichlorobenzene	- 0.015 to 81 ppm
1,4-dichlorobenzene	- 0.045 to 180 ppm
ethylbenzene	- 0.046 to 0.097 ppm
1,2,4-trichlorobenzene	- 2.8 to 210 ppm
naphthalene	- 0.87 ppm
phenanthrene	- 0.5 to 1.7 ppm
fluoranthene	= 1  ppm
Alpha-BHC	- 110 ppm
Delta-BHC	- 260 ppm
4,4'-DDE	- 130 to 840 ppm
4,4'-DDD	- 2100 to 22,000 ppm
	- 130 to 76,000 ppm
antimony	- 2.0 ppm
. =	5.8 to 313.0 ppm
	.3 ppm
	to PPm

cadmium	
chromium	- 7.7 to 46.6 ppm
copper	- 20.6 to 319.0 ppm
nickel	- 10.7 to 39.1 ppm
lead	= 14.2 to 50.8 ppm
zinc	- 52.7 to 655.0 ppm
selenium	- 0.209 ppm (EP TOX)

The concentrations of benzene and 1,4-dichlorobenzene exceed the maximum contaminant levels for drinking water standards (5 mcg/l and 75 mcg/l, respectively).

In April of 1989, Roy F. Weston, Inc. performed a geophysical study in the dump area and in the sinkhole and installed seven monitoring wells. Ground Penetrating Radar (GPR) and Electro-Magnetic Conductance (EM-31) were the methods employed. The GPR was performed to elucidate the stratigraphy over the dump area and sinkhole and to pick up any anomalies that would indicate buried material. The EM-31 was run in both the quadrature and in-phase modes to monitor conductance and magnetics in the dump and sinkhole.

2.6.2.1 GROUND PENETRATING RADAR (GPR)

Results of the GPR survey at the dump are shown in Figure 4-1 in the Weston Report (Reference 11). Only two traverses were included in the report. In order to properly evaluate the results, all the data must be presented. The method was used to determine bedrock elevations. However, in the two profiles which are presented, it is possible that the white areas are either

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fill or are conductive materials. About 160 feet along the traverse is a disturbed area that should be investigated with borings or by excavation. GPR was not originally recommended because of the probable presence of clay, which interferes with the resolution. It appears from the limited data presented that the GPR indicates that 46,000 cubic yards of fill material may be in the dump. Perhaps the additional traverses would show more information.

2.6.2.2 EM-31

EM-31 with a penetration of approximately 18 feet was run over the dump and the sinkhole. The quadrature phase measures conductance and can be used to define a plume where ionic specie are present. The in-phase measures the response of the instrument to metallic objects.

Within the dump there appears to be a plume of conductive material (Figure 16, adapted from Weston). The plume is defined within the shaded area. Background conductance at this site appears to be 10 mmhos/m. The area within the dump has conductance from 30 to 110 mmhos/m according to the study. This is significantly enough above background to warrant further investigation and to suspect that ionic materials are present causing a conductance above background. The Weston report interprets "these increased conductivities most likely reflect

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the thickening, more saturated and fine-grained unconsolidated materials within" the dump. It is true that saturated materials are more conductive than background, however, it is unlikely that this factor accounts for such high conductance. Samples collected from borings in October 1988 show that within the dump area the soil was contaminated with arsenic up to 313 ppm, chromium up to 46.6 ppm, copper up to 319 ppm, lead up to 50.8 ppm, nickel up to 39.1 ppm and zinc up to 646 ppm. The boring logs note that "bright green powder...white powder with plastic layers (product ?), plastic layers, paper; white powdery and dark green clay, slightly moist white powder" were present in Boring #1. Other borings in the dump area have similar materials listed in the logs. It is more probable to suspect that the higher conductivity values in the dump could come from these metals rather than any other factor.

In addition, the in-phase data shows several areas where metallic targets are suggested. The area in the northwestern corner has some particularly high values that need to be explained. There are additional areas that should have further investigation. Locations where geophysics were performed are shaded in red in Figure 15.

While the overhead lines interfered with the GPR over the sinkhole, according to the Weston Report (the traverses were not provided), there was only "minimal affect on the EM-31". Background conductivity values in the sinkhole were 1- to 20

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mmhos/m. Elevated values at the boundaries of the study area were attributed to cultural features such as the platform scale and the utility pole. The magnetic anomaly just south of the sinkhole is associated with a steel drainage culvert. Therefore it appears that no plumes or magnetic anomalies are present in the sinkhole based upon the available data.

#### 2.6.2.3 GROUNDWATER INVESTIGATION

According to an agreement with MDE, Weston drilled seven monitoring wells in April 1989 at the Central Chemical site. the wells were located based upon the regional groundwater flow to the southeast and upon the fracture traces identified by Weston (Figure 6).

In situ permeability tests were run on three wells: MW-2, 3 and 5. Tests could not be performed on wells 6 and 7 because of slumping in the wells. Also, MW-1 and MW-4 were not tested because they were completed in caverns. The variation in permeability among the three wells was from 2.56 to 1042 feet/year. This variability can be attributed to the fractures and solution cavities that develop as a result of fluid migration, even within a small area.

Six of the seven wells were sampled in May 1989 for VOCs, pesticides and total inorganics. MW-4 could not be sampled



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because of insufficient water. The pH in the monitoring wells varied from 6.2 to 6.7, in which Weston attributes to be rainwater reaching equilibrium with the CO<sub>3</sub> ion in the carbonate rock. Normally the pH in karst topography is 7 or 8. However, according to a report by Slaughter and Darling (1962), the onsite well (Wa-Bi-19) was measured for pH and the pH was 3.0. Well Wa-Bi-19 is 318 feet deep with casing to 38 feet. The report concluded that there was chemical contamination of groundwater at the site. In addition to the anomalous pH, the total iron was 35 ppm as compared to .00-1.8 which is normally found in the Conococheague limestone. Sulfate was 2560 ppm as compared to a normal value of 8.4 - 60 ppm for that lithology.

Among the volatiles which were later encountered were chloroform, benzene and ethylbenzene. Only benzene and chlorobenzene were above the MCL. Metals were also detected with beryllium, cadmium, copper, mercury, nickel and zinc present. Alpha-BHC, Beta-BHC, Delta-BHC and dieldrin were among the pesticides which were detected.

As a result of the groundwater sampling, Weston performed an analysis of the likelihood of human exposure to the chemicals present at the site. According to the report, the main migration pathway is the groundwater, however since Weston identified no domestic water supply in the area, they concluded that there are no receptors for the compounds of concern. They also concluded

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that the concentrations that were present would not be expected to produce adverse health effects.

Weston has further recommended studies to facilitate the closure of the dump area which would include:

1. the drilling of five additional monitoring wells to confirm boundary conditions

2. drill two deep wells to determine the vertical extent of contamination

3. sample wells on-site for VOCs, pesticides and total \* metals

4. perform packer tests in three wells to determine permeability and water chemistry in each fracture

5. drill five borings in the dump and analyze

6. repair wells MW-6 and 7 where slumping occurred

7. drill two borings in the sinkhole to confirm whether contamination exists

8. conduct a feasibility study to close the quarry

9. inventory domestic wells in the area.

# 2.6 REMEDIAL ACTION TO DATE

Under Complaint and Order C-O-77-432 and Supplemental Orders C-O-77-432-A, B and C, remedial action was taken to insure that there would be no migrating of contaminants through surface water runoff or through groundwater. To prevent surface water run-off,

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### 3.0 ENVIRONMENTAL SETTING

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3.1 WATER SUPPLY

Hagerstown receives its drinking water via public water supplied by the Richard Wilson Filtration Plant, located on the Potomac River northwest of Williamsport, Maryland. The river flows to the south.

The service area of the public water system includes a 3mile radius of the site and also extends beyond the 3-mile radius of the site.

Within a 3-mile radius of the site, there have been 271 well applications filed since 1969: 14 are listed as industrial wells, 25 as monitoring wells, 12 as farming wells and 219 as domestic wells. Within a one mile radius, only 14 well applications have been filed since 1969: 9 listed as domestic wells and 5 as monitoring wells (MDE Division of Residential Sanitation, 1989).

The Washington County Health Department (WCHD) only samples new wells, but will sample older wells at the request of the owner. Consequently, they do not have an accurate list of home wells being used for drinking water in the area. A house-tohouse survey would be necessary to create an accurate listing of

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existing wells. However, it is estimated that, combining the well applications and a groundwater study(Slaughter and Darling, 1962), at a minimum, 341 wells and springs are used for drinking water within a three mile radius. Therefore, approximately 1300 people are dependent upon groundwater as a drinking water source.

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Sharpsburg, Maryland has a surface water intake on the Potomac River which serves approximately 1200 people. Sharpsburg is located 13.5 miles south of the site. There are also three springs that supply drinking water located downstream of the site: St. James School, 6.3 miles, which serves 200 people and Boonesboro, 10.8 miles and Keedysville, 11.2 miles, which combined serve 2100 people.

### 3.2 SURFACE WATER

Surface water runoff travels to the south and enters the Hagerstown stormwater drainage system. The stormwater system flows underground through drain lines to Walnut Street (approximately one mile) where the stormwater flow empties out of a box culvert and into an unnamed tributary to Marsh Run. The unnamed tributary flows southwest past the pond at City Park and then joins Marsh Run, which flows beside Memorial Boulevard, southeast in a concrete drainage way and feeds Antietam Creek (See Figure 4).

In 1976, sediment samples were taken from Antietam Creek. Analysis of the samples revealed the presence of DDT, lead, arsenic and other contaminants. The highest levels of DDT and lead were found in the sediments of Antietam Creek where it is joined by an unnamed tributary (also known as Marsh Run by town residents).

Some on-site surface water runoff travels into a depression, at the bottom of which is a sinkhole (approximately two feet in diameter). This depression and sinkhole are located to the north of the entrance to Central Chemical Corporation and south of the filled sinkhole, inside the fence.

There are several bodies of surface water within a 3-mile radius, including Antietam Creek (two miles southeast), Marsh Run (1.5 miles south), Hamilton Run (1.5 miles west) and the previously mentioned unnamed tributary to Marsh Run (1.1 miles southwest). There are seven or more unnamed small streams, some which feed Antietam Creek and some which feed Conococheague Creek, within the 3-mile radius. There are six or more unnamed small ponds within the 3-mile radius.

Antietam Creek and several other small streams are used for recreational purposes, primarily fishing. Surface waters are also used for irrigation of commercial crops and commercial

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livestock watering.

3.3 GEOLOGY

The site is located in the Hagerstown Valley which is the eastern-most major structure in the Valley and Ridge Province. This province is characterized by rolling hills with topographic reliefs of approximately 150 feet which are the result of differential erosion of shales adjacent to carbonates. South Mountain, seven miles to the east, is the next closest major structural feature of this area. This mountain, which is cored with Cambrian-aged metasediments, is the dividing line between the Valley and Ridge Province and the Blue Ridge Province which is farther to the east.

The structural geology of the site area is explained as a sedimentary sequence of Cambrian-to-Silurian limestones, dolomites and cherts, with minor shale stringers, which have experienced multiple episodes of deformation. The deformations have generated tight, overturned folding and a complex system of faulting and jointing (See Figures 7). This network of fractures have been shown to exert a profound influence upon the hydrology of the region by: (a) affecting the direction that groundwaters are transported and (b) aiding the development of a pronounced secondary porosity within the original matrix of carbonate minerals. Secondary porosity is often developed to such a degree

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that solution channels, sinkholes and caverns are formed, mostly within the upper 50 feet of the rock. This is characteristic of\_ the development of early karst terrain.

### 3.4 GROUNDWATER

Public water is available to all homes within a 3-mile radius but records are not complete enough to differentiate between private and public water sources. Records of the MDE indicate that 271 wells have been drilled in a 3-mile radius of the area since 1969, of which 14 are located in a one mile radius of the site. According to Slaughter and Darling (1962), there are an additional 65 wells and 14 springs within a 3-mile radius of the site. The nearest known well is on location and is owned by Central Chemical Corporation. This well was completed in 1950. However, the exact location of this well is not known.

While it can be shown that the surface water drains to the south (See Figure 4), groundwater probably flows both east and west because of the site's location on the crest of an anticlinal feature. According to an earlier study, (Baker-Wibberly, Inc., 1977), bedding planes dip between 55-70° westward in the northern portion of the site and between 30-45° to the east when south of a postulated northwest-southeast fault that cuts across the spine of the anticline. The positioning of the site upon the arch or, "axial plane", of the anticline will cause the groundwater to

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flow in opposing directions along bedding planes depending on where one is located exactly on the site.

It should be remembered that, as a result of the complexity of the limestone fracture system, groundwater transportation routes may proceed in many different directions. Virtually all formations in this region act as aquifers in response to the fracture network, and any aquitards can only be described as leaky. All formations have several subzones of greater porosity which allow relatively greater flows of water within the formation. These subzones are often discontinuous and extremely difficult to trace, but are thought to be interconnected by the fracture network. Surface expression of this network is most easily observed as trellis and rectangular drainage patterns, but can also be seen through the use of air photometry in "fracture trace" analyses. Rose diagram analyses (Baker-Wibberly, Inc., 1977) of fracture traces seen within the study area suggest a pattern which consists of both northeast/southwest and northwest/southeast joint families. The Rose analyses were complimented in 1988 by an unpublished MDE study which utilized air photometry to outline fractures at the Central Chemical site which later were verified by a field examination (See Figure 6). The dip angles of the fracture planes are not apparent, but are believed to be either vertical or steeply inclined to the east in a fashion consistent with the structural style of the region (See Figure 4). The linear extent of the on-site fractures is not

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discernable because of landfill practices, but probably continues beneath the disrupted surface underneath the site.

Another consideration that relates geologic structures with the development of solution channels is that of the location of the fractures on the structures themselves. USGS studies of this area suggest that water flow is enhanced along joint patterns that occur along the crests of anticlines when compared to flow through fracture systems found in synclinal structures. This phenomenon is explained as the result of stress-field orientations which are more apt to open fissures in areas of convex folding. Conversely, areas undergoing concave flexing will still fracture, but will tend to squeeze shut many of the weakness planes. The more easily water can pass through a fracture, the quicker that fracture will succumb to dissolution forces.

There are three formations that produce water within a 3mile radius of the site. These are: the Conococheague Limestone, the Stonehenge Limestone and the Rockdale Run formation. The Conococheague Limestone is the formation that the site rests upon.

The Conococheague Limestone of Cambrian age, is thought to be between 2000 and 2600 feet thick. The formation is best described as an argillaceous, laminated, dark slate-blue limestone with interbedded dolomites in the basal sandy portion.

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Faulting has sometimes disturbed its normal underlying sequence with regard to the overlying Beekmantown Group.

Slaughter and Darling (1962) state that transmissivity values of the Conococheague range between 2,200 to 19,000 gpd/ft. According to this same report, well depths in this formation are between 40-500 feet and yield from 15-235 gpm of water (See Table 1). The well that is located on-site is completed in this formation. This well is 318 feet deep and originally yielded 45 gpm in 1950 when it was used for industrial purposes by the Central Chemical Corporation. Hydraulic conductivities are variable in karst terrains, but locally range from 2.24 x  $10^{-2}$  to 2.50 x  $10^{-3}$  cm/sec in this formation.

Overlying the Conococheague unit is the Ordovician-aged Stonehenge Limestone. This formation, a member of the Beekmantown Group, is approximately 500-800 feet in thickness and is composed of a massively-bedded clayey limestone which grades upward into thin conglomerate beds. Transmissivities of this unit are from 2000 to 200,000 gpd/ft. Well depths in the Stonehenge range between 70-910 feet and yield from 1.5-600 gpm. The hydraulic conductivities range from 2.2 x  $10^{-1}$  to 2.198 x  $10^{-3}$ cm/sec. according to pumping tests performed in this aquifer.

The third unit of concern is the Rockdale Run Formation of Ordovician age. Like the underlying Stonehenge Limestone, this

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formation also is a member of the Beekmantown Group and is made up of alternating limestones and dolomites that are between 1690-2550 feet thick. The basal section of this formation consists of a cryptozoon chert, approximately 100-200 feet thick, overlain by stromatolitic silty limestones and dolomites. Transmissivity figures for the Rockdale Run Formation are from 10-127,000 gpd/ft and well depths range from 19 to 230 feet. Yields from these wells are from 1.0-30 gpm. Hydraulic conductivities range from 9.85 x  $10^{-6}$  to 1.25 x  $10^{-1}$  cm/sec., depending on whether they are measured in fractured zones or in competent bedrock.

3.5. SOILS

The site rests upon a soil type classified as the Hagerstown silt loam which is a deep, well-drained, mature, red-to-orange soil which develops during the weathering of limestones. Analyses of this material show the mechanical composition to be 10% clay, 10% sand and 80% silt with an organic content adequate to support a variety of crops. Soils thicknesses vary considerably from 0 to 40 feet thick over bedrock, depending on the slope of the terrain. In this particular area, slopes are between 0 and 15%.

The surface of the Hagerstown silt loam often has a friable or crumbly character which affects the rate of water percolation. These surface permeabilities generally range from 0.06 to 0.6

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inches per hour which is sufficient to prevent flooding except during unusually heavy rainfalls.

The Hagerstown soils are considered to be the most important soils in Maryland. The soils are capable of supporting a large variety of commercial agricultural and wood crops with only a moderate need for expensive fertilizers. The fine particle size of the soil makes it susceptible to erosion but, with properly designed farming techniques, erosion is easily controlled.

3.6 CLIMATE AND METEOROLOGY

The site is 560 feet above sea level. Normal precipitation, measured over a 30 year period, is 38.84 inches per year, although rainfall measured 33.67 and 31.16 inches in 1987 and 1988 respectively. Average temperature, measured over the same period, is 53.5 degrees fahrenheit. These values were obtained from John Stiller, of the University of Maryland's State Climatology Office and were taken from the Hagerstown measuring station. The climate of the area is influenced by the height and breadth of the mountains which interfere with wind patterns, a phenomenon known as the "shadow effect". The net precipitation of this area is low and is calculated to be between 2.84 and 4.84 inches per year.

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AR100464

# 3.7 LAND USE AND POPULATION DISTRIBUTION

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In the immediate vicinity of the site, land use is industrial, residential and commercial, but primarily residential. The Washington County Planning Commission reports that, according to the 1980 U.S. Census, the population of Hagerstown is 34,132.

### 3.8 SENSITIVE ENVIRONMENTS

There are no coastal wetlands within two miles of the site. Fresh water wetlands of less than five acres are located approximately 1500 feet southeast of the site (a one acre, unnamed pond) and 0.8 miles northeast of the site (Hamilton Run).

According to the United States Department of the Interior, Fish and Wildlife Service, Maryland is a habitat for the peregrine falcon, bald eagle, Indiana bat, eastern cougar, Maryland darter (fish), swamp pink, Canby's dropwort, Harperella, small whorled pogonia and sandplain gerardia.

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# 4.0 WASTE TYPES AND QUANTITIES

### 4.1 PRELIMINARY INFORMATION

From approximately 1935 until 1965, pesticides were blended and packaged at this site. Mr. Robert Boone, MDE/HSWMA Regional Inspector, conducted an interview on January 20, 1989 with Earl Melvin Faith, a former employee of Central Chemical Corporation. Mr. Faith was employed at Central Chemical Corporation during the 1950's until 1965 as a supervisor overseeing warehouse operations.

"Mr. Faith said that when raw materials became defunct and were banned by the government, he was informed via company directives to bury said materials either in an old stone quarry which held approximately 15 feet of water (for soluble waste) or to bury the materials in 40 x 5 feet deep trenches throughout areas east/northeast form the quarry (for insoluble wastes). Mr. Faith said that he was personally responsible for the disposal of the following wastes during this period of time and said that it was acceptable practice for land disposal back then.

Wastes disposed of in a quarry (now abandoned) included bags of crystallized copper sulfate, bags of powdered chlordane, bags of powdered sulfur, bags of powdered arsenic and other soluble wastes. Wastes disposed of in earthen trenches included bags of

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CEN-024245 AR100466 unusable lime and sulfur (Dow Chemical), several thousand gallons of chlordane which was disposed in bags, 50-60 tons of Para Screen" which was used to mix with an insecticide and disposed of in 55 gallon fiber drums, cyanide gas canisters, sulfuric acid canisters, muriatic acid canisters, approximately fifty 55 gallon drums of 2-4,5T and a couple of hundred tons of DDT in fiber 55 gallon drums" (Memo to Central Chemical file from Robert Boone).

On February 22, 1989, Alan Williams and Laura Myers-Paligo, MDE/HSWMA, interviewed Mr. Faith again. Mr. Faith spoke about the hazardous waste mentioned above and added that he had buried "Dyrene". On this occasion, Mr. Faith stated that he had also buried large quantities of raw DDT in bags, "hundreds of boxcars", and that, one time only, some waste had been hauled to a county landfill.

The limited data presented by the GPR performed by Weston indicates that 46,000 cubic yards of fill material may be in the dump.

#### 4.2 ANALYTICAL RESULTS

On June 22, 1976, 11 sediment samples were collected along Antietam Creek. Samples 6 - 11 were collected downstream from Central Chemical corporation. Samples 6 - 10 have elevated levels of DDT (2.059 - .047 ppm). All samples have elevated

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levels of arsenic (5.07 - 1.03 ppm) and lead (1070 - 5 ppm). Levels of DDT and lead are highest at the site of sample 6, the first sample point downstream of Central Chemical Corporation. All samples also have elevated levels of chromium (80 - 11 ppm), with the highest level being from sample point 4, upstream of Central Chemical Corporation (See Table 1).

Four soil samples were collected on August 3, 1976. Two were collected from drainage ditches on Central Chemical Corporation property and one from a drain inlet pipe and one from a storm drain inlet. All samples had elevated levels of lead, arsenic and DDT. Sample 1, a drainage ditch, contained 188 ppm lead, 53.75 ppm arsenic, and 1.867 ppm DDT. Sample 2, a drainage ditch, contained 100.5 ppm lead, 16.17 ppm arsenic and 6535 ppm DDT. Sample 3, a drain inlet pipe, contained 124 ppm lead, 34 ppm arsenic and 6931 ppm DDT. Sample 4, a storm drain inlet, contained 138.5 ppm lead, 16.5 ppm arsenic and 46.68 ppm DDT. The storm drain where sample 4 was collected leads to an unnamed tributary and then to Antietam Creek (See Table 2).

Soil borings were collected on October 28 and 29, 1976 from seven locations at several depths at Central Chemical Corporation. Sample 1 revealed concentrations of lead (up to 325 ppm), arsenic (up to 20.85 ppm) and DDT (up to 471 ppm). Sample 2 revealed concentrations of lead (93.5 ppm), arsenic (16.28) and DDT (119.5 ppm). Sample 3 revealed concentrations of lead (up to

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197 ppm), arsenic (up to 300 ppm) and DDT (653.6 ppm). Sample 4 revealed concentrations of lead (31 ppm), arsenic (38 ppm) and DDT (85 ppm). Sample 5 revealed concentrations of lead (114.5 ppm), arsenic (17.7 ppm) and DDT (70.7 ppm). Sample 6 revealed concentrations of lead (up to 90.8 ppm), arsenic (up to 39.3 ppm) and DDT (up to 1646.4 ppm). Sample 7 revealed concentrations of lead (up to 89.1 ppm), arsenic (2.17 ppm) and DDT (up to 27.3 ppm) (See Table 2).

Soil borings were collected between April 26 and May 2, 1977 from 23 locations at several depths. Samples revealed elevated concentrations of lead, arsenic and DDT. Concentrations of lead ranged from 4.6 to 1020 ppm. Concentrations of arsenic ranged from 3.9 to 306 ppm. Concentrations of DDT ranged from 0.33 to 392.9 ppm (See Table 3).

The two monitoring wells sampled on May 16, 1977 contained lead, arsenic and DDT. In MW-A-5, the concentration of DDT was 0.33 ppb. In MW-E-7A, the concentration of arsenic was 1970 ppb and the concentration of DDT 2.20 ppb. Lead was present in both wells, but the concentration was less than 50 ppb (See Table 4).

One surface water sample was collected on May 16, 1977 from an abandoned quarry located 1200 feet south of the Central Chemical Corporation. The results indicate the presence of DDT at a concentration of 0.36 ppb, lead at less than 50 ppb and arsenic at less than 20 ppb (See Table 4).

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A soil sample was collected on March 27, 1987 from the dump area. The sample revealed elevated concentrations of chlordane (424 ppm), methoxychlor (9800 ppm), 4,4'DDE (734 ppm), 4,4'DDD (345 ppm), 4,4'DDT (3700 ppm), lindane 15 ppm), 1,2dichlorobenzene (45 ppm), 1,4-dichlorobenzene (14 ppm), chlorobenzene (16 ppm) and (2-butanone) (29 ppm) (See Table 5).

Soil samples were collected from seven borings on October 25 and 26, 1988. Samples revealed the presence of acetone (110 ppb), chloroform (13 ppb), tetrachloroethene (8 ppb), benzene (17 ppb), toluene (31 ppb), chlorobenzene (4600 ppb), xylenes (9200 ppb), 1,2-dichlorobenzene (81000 ppb), 1,3-dichlorobenzene (1200 ppb), 1,4-dichlorobenzene (180,000 ppb), ethylbenzene (53 ppb), 1,2,4-trichlorobenzene (210 ppm), naphthalene (3.7 ppm), pentachlorophenol (0.83 ppm), phenanthrene (8.4 ppm), fluoranthene (3 ppm), benzo(a)pyrene (0.091 ppm), pyrene (0.18 ppm), chrysene (0.15 ppm), anthracene (0.3 ppm), bis(2ethylhexyl)phthalate (5.9 ppm), di-n-butylphthalate (11 ppm), arsenic (313 ppm), beryllium (2.3 ppm), chromium (46.6 ppm), copper (319 ppm), nickel (39.1 ppm), lead (50.8 ppm), zinc (646 ppm), alpha-BHC (110 ppm), beta-BHC (790 ppm), delta-BHC (260 pm), DDE (1200 ppm), DDD (22,000 ppm) and DDT (76,000 ppm). (See Tables 6 & 7).

Groundwater samples were collected from two bore holes on

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October 25 and 26, 1988. Methylene chloride (50 ppm) and acetone (26 ppm) were present in BH-5. The samples from BH-2 revealed the presence of 1,1-dichloroethane (2.0 ppb), chloroform (up to 12 ppb), trichloroethene (3 ppb), benzene (45 ppb), toluene (7 ppb), chlorobenzene (651 ppb), 1,3-dichlorobenzene (27 ppb), 1,2dichlorobenzene (270 ppb), 1,4-dichlorobenzene (630 ppb) and ethylbenzene (up to 97 ppb) (See Tables 6 & 7).

Five soil samples were collected on and off-site on April 27, 1989. Results revealed the presence of DDT (798 ppm), DDD (0.860 ppm), DDE (43 ppm), chlordane (31 ppm), alpha-BHC (2.5 ppm), beta-BHC (2.5 ppm), lindane (0.46 ppm), delta-BHC (0.57 ppm) and endrin (40 ppm) (See Table 8).

Groundwater samples were collected on May 17 and 18, 1989. Samples from MW-1 revealed the presence of chloroform (2 ppb), 1,1,1-trichloroethane (1 ppb), 1,2-dichlorobenzene (up to 2.2 ppb), chlorobenzene (1 ppb), mercury (0.48 ppb), alpha-BHC (0.8 ppb), beta-BHC (up to 2.4 ppb), lindane (0.1 ppb), delta-BHC (up to 3 ppb) and dieldrin (up to 6 ppb) (See Tables 9 & 10).

Samples from MW-2 revealed the presence of benzene (19 ppb), toluene (1.3 ppb), chlorobenzene (182 ppb), total xylene (2.1 ppb), 1,2-dichlorobenzene (6.9 ppb), 1,4-dichlorobenzene (22 ppb), ethylbenzene (5.0 ppb), xylenes (4 ppb), acetone (168 ppb), isopropyl alcohol (250 ppb), arsenic (0.01 ppm), copper (33.8

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ppb), zinc (23.7 ppb), mercury (0.001 ppm), alpha-BHC (0.5 ppb), beta-BHC (5 ppb) and delta-BHC (up to 12 ppb).

Samples from MW-3 revealed the presence of benzene (11 ppb), chlorobenzene (8.8 ppb), 1,2-dichlorobenzene (1.9 ppb), 1,4dichlorobenzene (6.1 ppb), zinc (20.8 ppb), alpha-BHC (up to 3.9 ppb), beta-BHC (up to 7.8 ppb), and delta-BHC (up to 19 ppb).

Samples from MW-5, revealed the presence of benzene (14 ppb), chlorobenzene (109 ppb), total xylene (1 ppb), 1,2dichlorobenzene (5.8 ppb), 1,4-dichlorobenzene (12 ppb), copper (25.5 ppb), zinc (54.3 ppb), alpha-BHC (up to 12 ppb), beta-BHC (4 ppb), lindane (3 ppb) and delta-BHC (up to 14 ppb).

Duplicate samples from MW-5 revealed the presence of benzene (8.7 ppb), chlorobenzene (80 ppb), total xylene (1.1 ppb), 1,2dichlorobenzene (5.2 ppb), 1,4-dichlorobenzene (13 ppb), copper (27.1 ppb), zinc (57.5 ppb), alpha-BHC (23 ppb) and delta-BHC (16 ppb).

Samples from MW-6 revealed the presence of chloroform (2 ppb), 1,2-dichlorobenzene (2 ppb), chlorobenzene (1 ppb), arsenic (0.003 ppb), beryllium (38.3 ppb), cadmium (5 ppb), copper (55.9 ppb), nickel (379 ppb), zinc (512), alpha-BHC (1 ppb), beta-BHC (2 ppb), lindane (0.2 ppb), delta-BHC (0.5 ppb), and dieldrin (0.4ppb).

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Samples from MW-7 revealed the presence of chloroform (12 ppb), 1,1-dichloroethane (2 ppb), zinc (56.8), alpha-BHC (3 ppb), beta-BHC (57 ppb), lindane (1 ppb), delta-BHC (8 ppb), dieldrin (3 ppb) and endrin (3 ppb).

Figure 8 indicates the locations of sediment samples collected off-site in 1976 (Table 1). Samples 0291, 0277 and 0000 were collected upstream and east of the site. They are background samples with low concentrations of DDT and relatively low concentrations of lead and arsenic. Sample 0251 is slighty upstream of the site and has a low concentration of DDT and a relatively low concentration of lead, but has an elevated concentration of arsenic (5.07 ppm). Sample 0001 is downstream of the site, at the confluence of Marsh Run and Antietam Creek. This sample has a high concentration of DDT (2.059 ppm), an extremely high concentration of lead (1070 ppm) and an elevated level of arsenic (4.89 ppm), but this sample has a lower concentration of arsenic than Sample 0251, upstream of the site. Farther downstream of the site, Samples 0229, 0203 and 0134 reveal diminishing levels of DDT, lead and arsenic. Stormwater from the site enters an unnamed tributary which enters Marsh Run prior to Marsh Run joining Antietam Creek. These samples and subsequent investigation led to a Complaint and Order being issued to Central Chemical Corporation for a pollution violation in relation to the release of DDT, as well as lead and arsenic,

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to the waters of the State.

Figure 9 is a map which depicts concentrations of DDT found in soil samples collected from bore holes in the dump area (Table 7). The DDT concentrations were converted to percent and the contours are presented logarithmically in percent to aid interpretation. The contours in this figure indicate the presence of an elongated plume.

Figure 10 is a map which depicts concentrations of chlorobenzene found in soil samples collected from bore holes in the dump area (Table 6). The chlorobenzene concentrations are presented logarithmically in ppb. As in Figure 9, the contours indicate the presence of an elongated plume.

Figure 11 indicates the location of soil samples collected on- and off-site that revealed the presence of pesticides such as DDT, chlordane, endrin and alpha, beta, delta and gamma-BHC (Table 8). Sample 5 is a background sample from an adjacent property located northwest of the site and reveals low concentrations of total pesticides. Sample 3 was collected from the west side of the site, outside the property line, from an area where two drains discharge. This sample contained the highest concentration of total pesticides (860.88 ppm). Sample 4 contained the next highest concentration of total pesticides (241.87 ppm) and was collected from the northwest corner of the

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site near the pesticide storage building. Sample 2 was collected upgradient of a storm drain and contained concentrations of total pesticides (168.99 ppm). Sample 1 was collected from the storm drain, downgradient of Sample 2, and contained 67.15 ppm total pesticides. Some of these pesticides have migrated off-site and may pose a risk to human and/or environmental health.

Figures 12, 13 and 14 (Table 10) indicate the location of monitoring wells which were sampled by Weston. In Figure 12, total VOCs in groundwater were found to be present up to 203 ppb. Several VOCs are known or suspected carcinogens and have been assigned an MCL for public drinking water by the U.S. EPA. The highest concentrations occur in the dump area in MW-2 ( 203 ppb) and south of the filled sinkhole in MW-5 (108 ppb). Figure 13 depicts the levels of total metals found in groundwater. Total metals are highest (990 ppb) in MW-6, located next to the warehouse and lowest (0.480) in MW-1, north of the access road. Figure 14 depicts the levels of total pesticides found in groundwater. Total pesticides are highest (57 ppb) in MW-7, on the west side of the property and lowest (0 ppb) in MW-6, located next to the warehouse.

Figure 15 depicts the areas of the property that were surveyed with Ground Penetrating Radar (GPR) and EM-31.

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### 5.0 FIELD TRIP REPORT

### 5.1 SITE OBSERVATIONS

On March 9, 1989, the site was visited by Robert Boone and Laura Myers-Paligo, MDE/HSWMA. Mr. Boone related his interview with Earl Faith, indicating that Mr. Faith accompanied him to the site and pointed out the location of the "guarry" where soluble wastes were dumped and the location of earthen trenches where insoluble wastes were dumped. Mr. Boone stated that the area that Mr. Faith referred to as a "guarry" was the same area marked on Figure 2 as "filled and regraded sinkhole". The ground at the site was snow covered, but areas of dumping were still visible. Stakes with orange flags were also visible; these indicate the location of borings performed on October 25-27, 1988.

To the south of the "filled and regraded sinkhole" is a depression containing a smaller sinkhole (approximately two feet in diameter).

In April of 1989, Mary-Linda Adams and Jon Mattes visited the site. They met with Dr. Fred Bop of Roy F. Weston, Inc., Central Chemical Corporation's consulting firm to discuss Weston's sampling plan.

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### 5.2 PERSONS CONTACTED

 Barbara Brown MD Department of the Environment - HSWMA (301) 631-3487

- Robert Boone MD Department of the Environment - HSWMA (301) 791-4787
- 3. Raymond Ludlow MD Department of the Environment - WMA (301) 631-3654
- 4. Greg Anderson MD Department of the Environment - WMA (301) 631-3707
- Kirk Warner, Assistant Superintendent Hagerstown Water Department (301) 790-3200, ext. 174
- Bob Gudmundson Washington County Planning Commission (301) 733-4702
- Farl Melvin Faith Hagerstown Street Department (301) 790-3200, ext. 179
- 8. David Schwartz, President Central Chemical Corporation (301) 733-4702
- 9. Dr. Fred Bop Roy F. Weston, Inc. (301)

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6.0 TOXICOLOGICAL EVALUATION



### 6.1 INTRODUCTION

Sediment samples were collected from 11 locations along Antietam Creek on June 22, 1976. Organic analyses were performed by TSD-Chemical and Biological Investigations Laboratory. Metals analyses were performed at the U.S. EPA Annapolis Field Office.

On August 3, 1976, personnel from the Maryland Water Resources Administration (MD/WRA) collected soil samples from two drainage ditches on the Central Chemical Corporation property and from two drainage inlets leading from the property. On October 28 and 29, 1976, personnel from the Maryland Water Resources Administration (MD/WRA) conducted soil borings and collected 15 split spoon samples from Central Chemical Corporation property. The samples collected on August 3, October 28 and 29, 1976 were analyzed for arsenic, lead and DDT by the MD/WRA laboratory.

Between April 26 and May 2, 1977, Baker-Wibberly & Associates, Inc. performed 33 test borings and collected 62 soil samples at the site. The soil samples were analyzed for arsenic, lead and DDT. On May 16, 1977, Baker-Wibberly & Associates, Inc. collected water samples from two monitoring wells and an abandoned quarry. All samples were analyzed for arsenic, lead and DDT. The Baker-Wibberly report does not indicate where the samples were analyzed.

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On March 27, 1987, personnel from MD/DHMH collected one soil sample from the Central Chemical dump area which was analyzed for EP Toxicity Organics, organics and volatile organics by the MD/DHMH laboratory.

Between October 25 and 28, 1988, Weston, Inc. performed borings, collected soil samples from seven bore holes and collected water samples from two bore holes at the site. The two water samples were split with MDE. The soil samples collected by Weston were analyzed for volatile organics, semi-volatiles, inorganics, pesticides and herbicides by Weston. The water samples were analyzed for volatile organics, both for Weston and MDE.

On April 27, 1989, MDE personnel collected five soil samples which were analyzed for pesticides by the MD-DHMH laboratory.

On May 17 and 18, 1989, MDE personnel collected samples from seven monitoring wells which were split with Weston. The MDE samples were analyzed for total metals, volatile organics and pesticides by the MD-DHMH laboratory. The samples taken by Weston were analyzed for volatile organics, pesticides and inorganics by Weston.

Contaminants successfully analyzed and revealed in the data include heavy metals, pesticides, volatile organic compounds (VOCs)



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and semi-volatile organic compounds. The main contaminants of concern are lead, arsenic, chromium, pesticides and VOCs. Arsenic, pesticides and VOCs were present in groundwater in excess of the U.S. EPA's Maximum Contaminant Level (MCL), Proposed Maximum Contaminant Level (PMCL), or the National Interim Primary Drinking Water Regulation (NIPDWR), hereafter referred to as the Interim Maximum Contaminant Level (IMCL).

Lead, arsenic, chromium, pesticides and VOCs were present in soil in excess of the U.S. EPA's MCL, PMCL or IMCL. The MCL is a standard for public water systems, but it is used as a standard for soil because there are no standards set for soil and contaminants that are in the soil have the potential for migrating to the groundwater. Concentrations of lead in one sample also exceed the U.S. EPA's 10-day health advisory for lead in soil (500 ppb).

### 6.2 ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

6.2.1 GROUNDWATER

The two monitoring wells sampled on May 16, 1977 contained lead, arsenic and DDT. Concentrations of DDT were present up to 2.20 ppb. Concentrations of arsenic were above the U.S. EPA's Maximum Contaminant Level (MCL) for arsenic, 0.05 ppb (See Table 4).

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Groundwater samples were collected from two bore holes on October 25 and 26, 1988. The samples revealed the presence of methylene chloride, acetone, 1,1-dichloroethane, chloroform, trichloroethene, benzene, toluene, chlorobenzene, 1,3dichlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene and ethylbenzene. The U.S. EPA's MCL or PMCL was exceeded for several contaminants: benzene (5 ppb MCL), trichloroethene (5 ppb MCL), 1,4-dichlorobenzene (75 ppb MCL) and chlorobenzene (100 ppb PMCL) (See Table 6).

Groundwater samples were collected from six monitoring wells on May 17 and 18, 1989. Samples revealed the presence of 1,1dichloroethane, chloroform, 1,1,1-trichloroethane, 1,2dichlorobenzene, 1,4-dichlorobenzene, chlorobenzene, benzene, toluene, xylenes, acetone, isopropyl alcohol, arsenic, beryllium, cadmium, copper, mercury, nickel, zinc, alpha-BHC, beta-BHC, lindane, delta-BHC, dieldrin and endrin. The U.S. EPA's MCL, IMCL or PMCL was exceeded for several contaminants: benzene (5 ppb MCL), arsenic (5 ppb IMCL), endrin (0.2 ppb IMCL) and chlorobenzene (100 ppb PMCL) (See Tables 9 and 10).

### 6.2.2 SOIL/SEDIMENT

On June 22, 1976, 11 sediment samples were collected along Antietam Creek. Samples 6 - 11 were collected downstream from

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Central Chemical corporation. Samples 6 - 10 have elevated levels of DDT (2.059 - .047 ppm). All samples have elevated levels of arsenic (5.07 - 1.03 ppm) and lead (1070 - 5 ppm). Levels of DDT and lead are highest at the site of sample 6, the first sample point downstream of Central Chemical Corporation. All samples also have elevated levels of chromium (80 - 11 ppm), with the highest level being from sample point 4, upstream of Central Chemical Corporation. The U.S. EPA's IMCL was exceeded for lead (50 ppb IMCL) and arsenic (5 ppb IMCL) (See Table 1).

Four soil samples were collected on August 3, 1976. Two were collected from drainage ditches on Central Chemical Corporation property and one from a drain inlet pipe and one from a storm drain inlet. All samples had elevated levels of lead, arsenic and DDT. The storm drain where sample 4 was collected leads to an unnamed tributary and then to Antietam Creek. The U.S. EPA's IMCL was exceeded for lead and arsenic (See Table 2).

Soil borings were collected on October 28 and 29, 1976 from seven locations at several depths at Central Chemical Corporation. Samples revealed elevated concentrations of lead, arsenic and DDT. The U.S. EPA's IMCL was exceeded for lead and arsenic (See Table 2).

Soil borings were collected between April 26 and May 2, 1977 from 23 locations at several depths. Samples revealed elevated

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CEN-024261 AR100482 concentrations of lead, arsenic and DDT. The U.S. EPA's IMCL was exceeded for lead and arsenic (See Table 3).

A soil sample was collected on March 27, 1987 from the dump The sample revealed elevated concentrations of chlordane, area. methoxychlor, 4,4'DDE, 4,4'DDD, 4,4'DDT, lindane, 1,2dichlorobenzene and 1,4-dichlorobenzene as well as chlorobenzene and (2-butanone). The U.S. EPA's MCL, IMCL or PMCL was exceeded by chlordane (2 ppb PMCL), methoxychlor (100 ppb IMCL), lindane (4 1,2-dichlorobenzene (600 ppb PMCL) dqq IMCL), and 1.4dichlorobenzene (75 ppb MCL) (See Table 5).

Samples were collected from seven borings on October 25 and 26, 1988. Samples revealed the presence of VOCs, semi-volatile compounds, inorganics and pesticides. The U.S. EPA's MCL, IMCL and PMCL was exceeded by benzene (5 ppb MCL), chlorobenzene (100 ppb PMCL), tetrachloroethene (5 ppb PMCL), 1,2- and 1,3dichlorobenzene (600 ppb PMCL), 1,4-dichlorobenzene (75 ppb MCL), pentachlorophenol (200 ppb PMCL), arsenic (5 ppb IMCL), chromium (50 ppb IMCL) and lead (5 ppb IMCL) (See Tables 6 and 7).

Five soil samples were collected on and off-site. Results revealed the presence of DDT, DDD, DDE, chlordane, alpha-BHC, beta-BHC, lindane, delta-BHC and endrin. The U.S EPA's IMCL or PMCL was exceeded by chlordane (2 ppb PMCL), lindane (4 ppb IMCL) and endrin (0.2 ppb IMCL) (See Table 8).

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### 6.2.3 SURFACE WATER



One surface water sample was collected from an abandoned quarry located 1200 feet south of the Central Chemical Corporation. The results indicate the presence of DDT, lead and arsenic (See Table 4).

### 6.2.4 BURIED OBJECTS

The interview in Section 4.0 with a former employee states that there are buried canisters of cyanide gas, muriatic acid and sulfuric acid at Central Chemical Corporation.

### 6.3 POTENTIAL ENVIRONMENTAL AND HUMAN EXPOSURE PATHWAYS

Potential environmental pathways include those related to human exposure to contaminated soil, surface water, groundwater and the food chain. Potential human exposure to contaminants include direct contact with and inhalation of soil, ingestion of water through use of residential wells and direct contact with surface water and sediment. There is open access to the dump area, so there is a threat of exposure to children or other persons in the vicinity of the site. There is also a potential for contaminated dust to accumulate on shoes and tires and therefore carry contamination off-site.

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Contaminants have been shown to have migrated off-site. DDT, DDE, chlordane, alpha-, beta-, gamma- and delta-BHC and endrin were detected in sediment in a storm drain that receives run-off from Central Chemical. The storm drain empties into an unnamed tributary to Marsh Run and Antietam Creek (See Figure 1). In 1976, DDT was detected in Antietam Creek and the source was traced to Central Chemical Corporation. There is a potential for contaminants onsite to adversely affect aquatic life in the unnamed tributary, Marsh Run and Antietam Creek.

Some of the contaminants, particularly DDT and chlordane, are persistent in the environment and can be bioaccumulated in the food chain. A threat to human health from bioaccumulation exists when people eat organisms belonging to a food chain that included the contaminant.

6.4 DEMOGRAPHICS

The site is located in the City of Hagerstown in Washington County. There are residential areas and a shopping center in close proximity to the site. The population of Hagerstown is 34,132. Approximately 1300 people are dependent on groundwater as a drinking water source within a 3-mile radius of the site.

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6.5 HEALTH EFFECTS OF CONTAMINANTS FOUND



### 6.5.1 LEAD

Elevated lead concentrations were found in on-site soil samples (up to 1020.0 ppm) and off-site sediment samples (up to 1070 ppm). Lead is considered to be a hazardous substance and a priority toxic pollutant by the U.S. EPA. The IMCL for lead in public drinking water is 50 ppb and the PMCL is 5 ppb. Lead may enter the body through inhalation of dusts, ingestion and skin and eye contact. Children, especially those under two years of age, are most threatened by exposure to lead, which can cause permanent damage to the developing nervous system leading to mental retardation or more subtle learning, behavioral or psychological problems. Lead also effects blood forming organs, causing anemia, and can damage other body systems such as the kidneys (MDE/TESH). Exposure to lead presents a hazard to reproduction, and exerts a toxic effect on conception, pregnancy and the fetus. Studies, using animals, suggest that lead may have adverse effects on the immune system. Lead has been shown to reduce or eliminate populations of bacterial and fungi normally found on leaf surfaces and in soil (Clement Associates, 1985 and Sittig, 1985).

6.5.2 ARSENIC

Arsenic was found in groundwater and soil samples on-site (up

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to 1.97 ppm and 300 ppm, respectively) and sediment samples offsite (up to 5.07 ppm). Arsenic is considered a carcinogen, a hazardous waste constituent, a hazardous substance in some forms and a priority toxic pollutant by the U.S. EPA. The IMCL for arsenic in public drinking water is 50 ppb. Arsenic enters the human body through skin, eyes or respiration or ingestion. Arsenic compounds may produce contact dermatitis and skin sensitization, skin cancer and lung cancer. Skin cancer in humans is associated with exposure to arsenic compounds in drinking water, drugs and occupational environment. Arsenic compounds have been reported to be teratogenic, fetotoxic and embryotoxic in several animal species. An increased incidence of multiple malformations among children born to women occupationally exposed to arsenic have been reported. Arsenic compounds have been found to cause chromosomal damage in animals and chromosome aberrations in humans (Clement Associates, 1985 and Sittig, 1985).

### 6.5.3 CHROMIUM

Chromium was found in on-site soil samples (up to 46.6 ppm). Chromium is considered a hazardous waste constituent and a priority toxic pollutant by the U.S. EPA. The hexavalent form of chromium (+ 6) is considered to be a primary carcinogen, inducing cancer at the site of administration only, in animals and humans. The IMCL for chromium in public drinking water is 50 ppb. Chromium compounds act as allergens which cause dermatitis to exposed skin.

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Inhalation of hexavalent chromium salts causes irritation and inflammation of the nasal mucosa and ulceration and of the nasal septum. Hexavalent chromium also produces kidney damage in humans and animals. The kidneys and respiratory system are more sensitive than the liver to the toxic effects of hexavalent chromium. Hexavalent chromium compounds can cause DNA and chromosomal damage in humans and animals (Clement Associates, 1985).

### 6.5.4 BENZENE

Benzene was found in on-site groundwater (up to 45 ppb) and soil (up to 17 ppb). Benzene is considered a carcinogen by the International Agency for Research on Cancer (IARC) and a hazardous substance, a hazardous waste and a priority toxic pollutant by the U.S. EPA. The MCL for benzene in public drinking water is 5 ppb. Chronic exposure to benzene has been shown to cause leukemia in humans and aplastic anemia with a latent period of up to ten years. Benzene exposure is associated with chromosomal damage in animals and humans. Exposure to very high concentrations of benzene can be fatal within minutes. Liquid and vapor phases of benzene may cause irritation to the eyes, skin and upper respiratory tract. Liquid aspirated into the lungs may cause pulmonary edema and hemorrhage (Clement Associates, 1985 and Sittig, 1985).

### 6.5.5 CHLOROBENZENE

Chlorobenzene was found on-site in groundwater (up to 651 ppb)

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and soil (up to 4600 ppb). Chlorobenzene is considered a hazardous substance, a hazardous waste and a priority toxic pollutant by the U.S. EPA. The PMCL for chlorobenzene in public drinking water is 100 ppb. The State of Maryland recommends 50 ppb chlorobenzene in Chlorobenzene drinking water. is a component of DDT. Chlorobenzene enters the body through inhalation, ingestion and eye and skin contact and may cause irritation of the eyes, throat and skin, drowsiness, incoherence and liver damage. Chlorobenzene is soluble in alcohol, benzene and chloroform, all of which are present in the groundwater and soil at the site (Sittig, 1985).

### 6.5.6 DICHLOROBENZENE

Dichlorobenzene (1,2-,1,3- and 1,4-) (DAB) were found on-site in groundwater (up to 900 ppb) and soil (up to 180,000 ppb). Dichlorobenzenes are considered to be hazardous substances, hazardous wastes and priority toxic pollutants by the U.S. EPA. The MCL for 1,4 dichlorobenzene in public drinking water is 75 ppb. The PMCL for 1,2- and 1,3-dichlorobenzene in public drinking water is 600 ppb. Routes of entry for dichlorobenzene include inhalation, ingestion, eye and skin contact for 1,4-DAB and also skin absorption for 1,2-DAB. DAB has been known to cause hemolytic anemia and liver necrosis, and 1,4-DAB has been found in human fat tissues. Other health effects of DAB include headaches, irritation of eyes and nose, skin blistering, liver and kidney damage, weight loss, jaundice and cirrhosis (Sittig, 1985).

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### 6.5.7 TRICHLOROETHENE (TCE)

TCE was found in groundwater samples on-site (up to 3 ppb). It is considered to be an animal carcinogen by the IARC and a hazardous substance, a hazardous waste and a priority toxic pollutant by the U.S. EPA. The MCL for TCE in public drinking water is 5 ppb. Routes of entry to the body include inhalation, ingestion, skin absorption and skin and eye contact. Irritation to eyes, nose and throat may be a result of exposure to TCE vapor. Liquid TCE may cause dermatitis after prolonged or repeated skin contact. Acute exposure to TCE depresses the central nervous system and unconsciousness and death have been reported (Sittig, 1985).

### 6.5.8 PENTACHLOROPHENOL

Pentachlorophenol (PCP) was found in an on-site soil sample (0.83 ppm). It is considered to be a hazardous substance, a hazardous waste and a priority toxic pollutant by the U.S. EPA. The PMCL for pentachlorophenol in public drinking water is 200 ppb. PCP is a bactericide, fungicide and slimicide which is used for wood preservation. It is also used as an insecticide because of it's biological properties as a chlorinated hydrocarbon. Routes of entry to the body include inhalation, ingestion, skin absorption and eye and skin contact. Chronic exposure to PCP may result in

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headache, irritation of eyes, nose and throat, muscle weakness," chloracne, weight loss and liver and kidney damage (Sittig, 1985).

### 6.5.8 PESTICIDES

Endrin was found in a groundwater sample on-site (3 ppb) and soil samples on-site (up to 40 ppm). It is considered to be a hazardous substance, a hazardous waste and a priority toxic pollutant by the U.S. EPA. The IMCL for endrin in public drinking water is 0.2 ppb. Endrin can enter the body through inhalation, ingestion, skin absorption and eye and skin contact and mainly effects the central nervous system. Endrin is persistent in the environment, strongly bioaccumulated by aquatic organisms and is highly toxic to mammals, aquatic and terrestrial wildlife after acute exposure.

Dieldrin was found in groundwater samples on-site (up to 6 ppb). Dieldrin is considered to be a hazardous substance, a hazardous waste and a priority toxic pollutant by the EPA. Dieldrin is also considered an animal carcinogen by IARC and may be a human carcinogen. There is no MCL set for dieldrin, but to protect human health, the permissible concentration in water is preferably zero. Dieldrin may enter the body through inhalation, ingestion, skin absorption and skin and eye contact. Acute health effects include nausea, headaches, vomiting, irritability and

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weakness, with severe exposure possibly causing convulsions and death. Chronic health effects can occur at some time after exposure and last for an unspecified amount of time. Chronic effects may include cancer, liver and central nervous system damage, skin rash, delayed convulsions, reduced fertility and damage to a developing fetus. Dieldrin is concentrated in breast milk and thereby may be transferred to breast-feeding infants. Dieldrin is very persistent in the environment, bioaccumulates in the fat tissues of humans and wildlife and is toxic to freshwater and marine organisms. Dieldrin is very toxic to terrestrial wildlife and domestic animals at low levels.

DDT, lindane, chlordane and methoxychlor were found in soil samples on-site (up to 76,000 ppm, 15 ppm, 424 ppm and 9800 ppm, respectively). DDT was also found in sediment samples off-site (up to 2.059 ppm). DDT is considered to be a hazardous substance, a hazardous waste, a priority toxic pollutant and a potential carcinogen by the U.S.EPA. There is no MCL set for DDT, but the EPA has determined that a level of 0.00024 ug/l in water will impose a lifetime cancer risk of 1 in 100,000  $(10^{-5})$ .

DDT may enter the body through inhalation, ingestion, skin absorption and eye and skin contact. Acute effects of exposure to DDT include a prickling sensation in the tongue mouth and lower face, dizziness, abdominal pain, headache, nausea, and loss of muscle control and tremors. Very high exposures can cause

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convulsions and death. Chronic exposure to DDT may cause adverse effects to the liver, kidneys and the central nervous system and damage to a developing fetus. Prolonged exposure may irritate the eyes, skin and nose. DDT is very persistent in the environment, migrates through run-off, erosion and volatilization, bioaccumulates in the fat tissues of wildlife and humans, is toxic to aquatic organisms and has been determined to decrease the reproductive success of many bird species. DDT has a low water solubility, but is soluble in benzene and acetone, both of which are present in the soil and groundwater at the site.

Lindane and chlordane are considered to be hazardous substances, hazardous wastes and priority toxic pollutants. Both are also considered carcinogens, lindane by the U.S. EPA and chlordane by the National Cancer Institute (NCI). Lindane was also found in groundwater samples on-site (up to 3 ppb). The IMCL for lindane in public drinking water is 4 ppb and the PMCL is 0.2 ppb. Lindane enters the body through inhalation, ingestion, skin absorption and eye and skin contact and can cause several symptoms, including: irritation of eyes, nose and throat, headaches, respiratory problems, aplastic anemia and muscle spasms. Lindane is fairly persistent in the environment and is toxic to, and bioaccumulates in, aquatic organisms.

The PMCL for chlordane in public drinking water is 2 ppb. Chlordane enters the body through inhalation, ingestion, skin

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absorption and skin and eye contact. Effects of exposure include blurred vision, ataxia, coughing, abdominal pain and irritability. Chronic exposure may result in liver damage and enzyme changes in the body and chlordane may act as a cumulative neurotoxin. Chlordane is very persistent in the environment and strongly bioaccumulates in, and is highly toxic to, aquatic organisms.

Methoxychlor is considered to be a hazardous substance by the U.S. EPA. The IMCL is 100 ppb. Methoxychlor may enter the body through inhalation and ingestion and has been known to cause trembling, convulsions and kidney and liver damage in animals (Clement Associates, 1985 and Sittig, 1985).

### 6.5.9 CYANIDE

Canisters of cyanide gas are reported to be buried on-site. The type of cyanide gas is not known, but the toxicity of the gas is based on the cyanide ion and not on other constituents of the gas. The gas is flammable and poisonous. It may enter the body through inhalation and skin and eye contact. Low exposures will cause immediate eye and nose irritation. Other symptoms of exposure are constriction of the chest, confusion, headache, unconsciousness and feeble and rapid respiration. In the case of a large dose, death will occur within a few minutes (Handbook or Toxic and Hazardous Chemicals and Carcinogens, 1985).

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#### 6.6 EVALUATION AND DISCUSSION

Samples collected by MDE personnel were analyzed by the Maryland Department of Health and Mental Hygiene's laboratory (MD-DHMH Lab). Though the results are not Contract Laboratory Program (CLP) data, the MD-DHMH Laboratory has provided reliable results in the past. Samples collected by the consulting firm, Weston, were analyzed at the Weston Laboratory, a CLP lab. Weston added a qualifier to some of the results: "\* indicates a result below exact quantification." This indicates that a contaminant was present but that it is not possible to determine the exact quantity of the substance.

Groundwater and soils on the site are contaminated with volatile organic compounds, heavy metals and pesticides. There are 341 residential wells with a 3-mile radius of the site. If the 1300 residents are drinking this water, there is a potential health risk for those residents. Individuals coming in direct contact with contaminated soils will be at direct risk of exposure via dermal contact, inhalation and ingestion of soils. A portion of the site is fenced, but the dump area where many soil contaminants are found is not secured.

To the northeast of the site is a new residential development, to the east of the site is a shopping center and west and southwest of the site there is another residential area. The area of the

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site that is not fenced has been used as a dumping ground. These are indications that the area has traffic (foot or vehicular) moving through it and those individuals will be at risk of exposure.

Soil contaminants picked up by surface water may enter the storm water drainage system and be carried to an unnamed tributary to Marsh Run which empties into Antietam Creek. Several of the contaminants are toxic to aquatic life. Several of the pesticides are known to be persistent in the environment and to bioaccumulate within organisms.

Based on the evaluation of the site at this time, the site is considered to be a potential public health threat. The groundwater and soil at the site are contaminated with VOCs, heavy metals and pesticides that pose a toxicological threat to human and aquatic life and some contaminants have already migrated off-site.

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CEN-024275

### 7.0 CONCLUSIONS AND RECOMMENDATIONS

Samples collected by MDE personnel were analyzed by the Maryland Department of Health and Mental Hygiene's laboratory (MD-DHMH Lab). Though the results are not Contract Laboratory Program (CLP) data, the MD-DHMH Laboratory has provided reliable results in the past. Samples collected by the consulting firm, Weston, were analyzed at the Weston Laboratory, a CLP lab. In order to expedite the whole process of environmental clean-up, the concept of using available sampling results, not necessarily CLP data, to complete the SSI report was proposed to and accepted by Region III of the U.S. EPA. This Available Information Screening Site Inspection (AISSI) will be followed by a Listing Site Investigation (LSI).

High levels of VOCs, pesticides and heavy metals were detected in the groundwater and soils at the site. The majority of samples were taken in the dump area where high levels would be expected. However, pesticides, lead and arsenic were also found in several areas off-site. indicating contaminant migration. These contaminants are toxic to aquatic life and pesticides bioaccumulate in the fat tissues of aquatic organisms and humans. Approximately 1300 residents may rely on groundwater for drinking water, indicating that there is a threat to public health. Based on the above evaluation, the Central Chemical Corporation site is recommended for a high priority LSI and MDE will prepare a work plan to address the above concerns.

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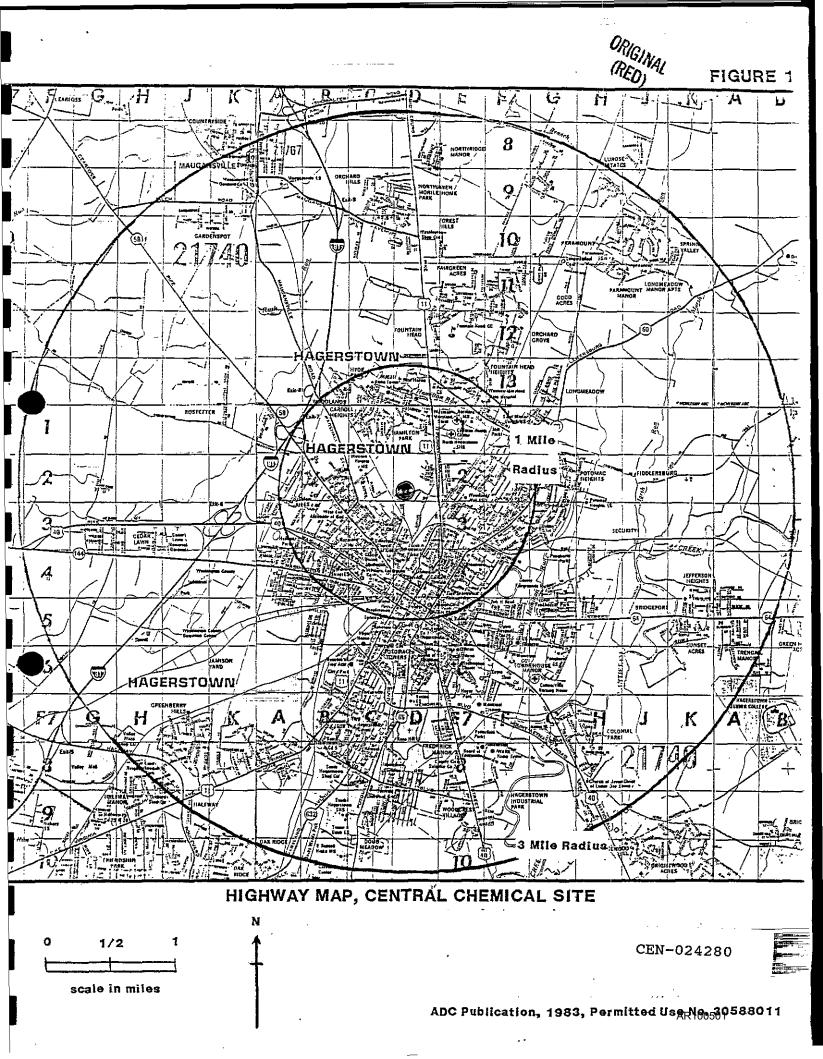


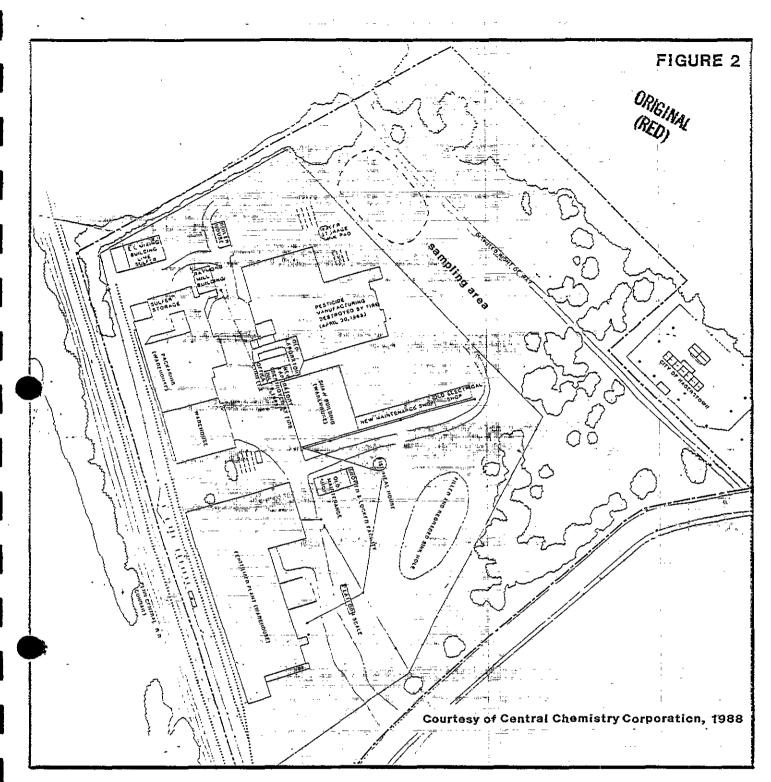
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FIGURES	·

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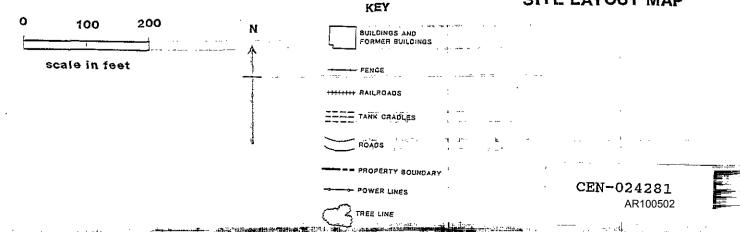
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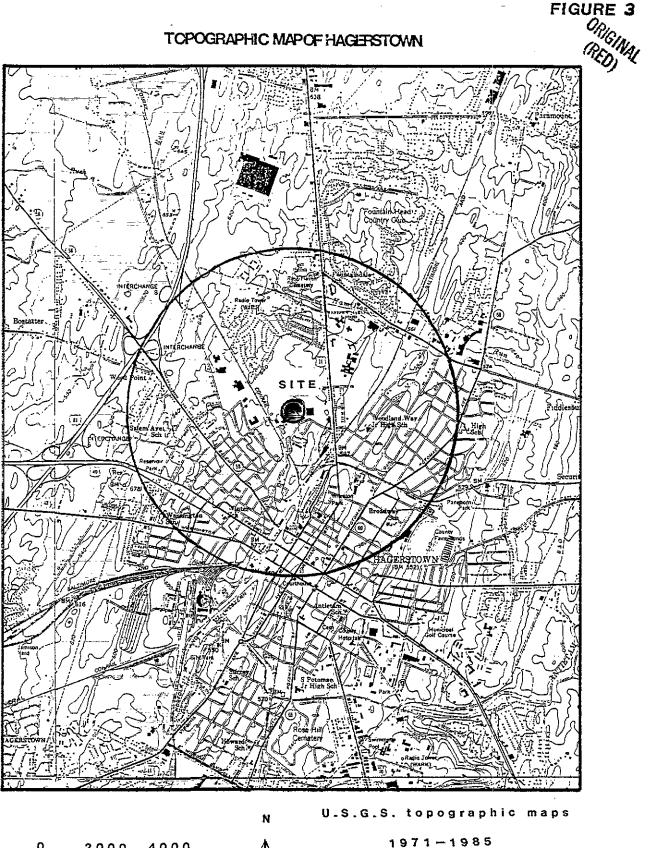




SITE LAYOUT MAP



TOPOGRAPHIC MAPOF HAGEPSTOWN



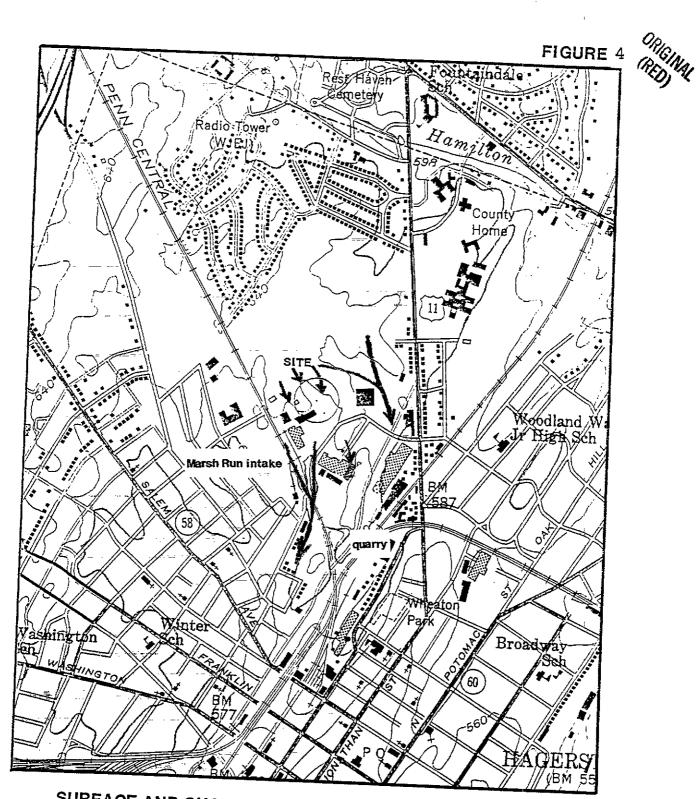
0 2000 4000 scale in feet

one mile radius

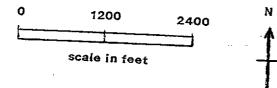
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FIGURE 3



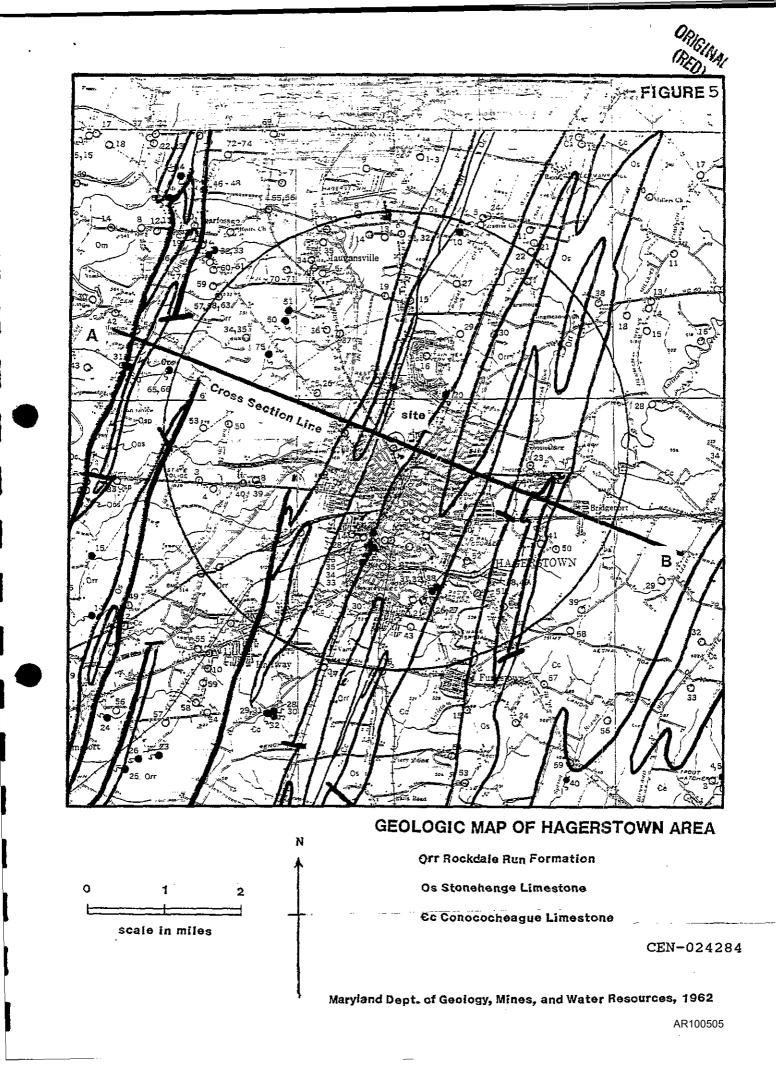
# SURFACE AND SHALLOW GROUNDWATER FLOW DIRECTIONS



runoff directions

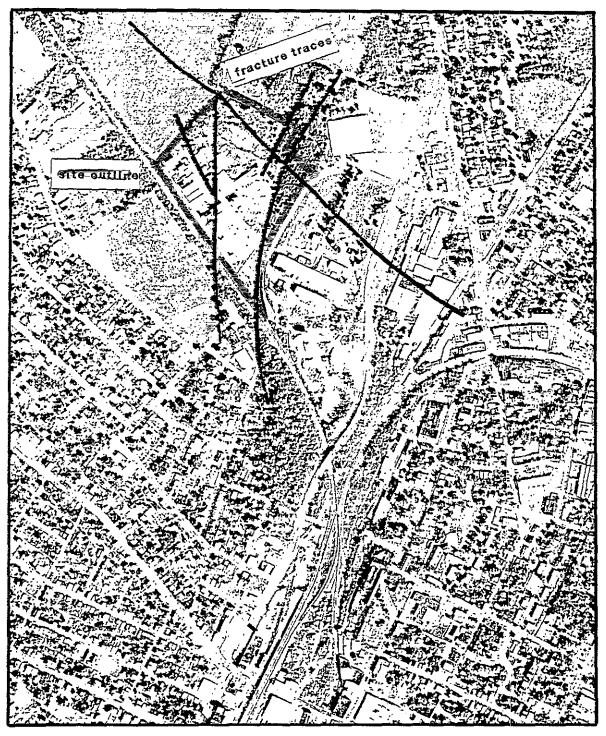
U.S.G.S. topographic maps 1971—1985

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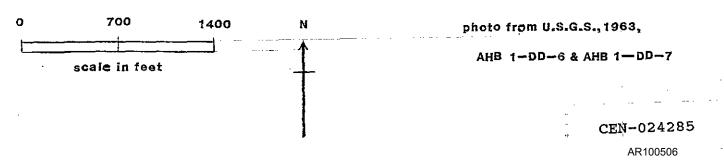


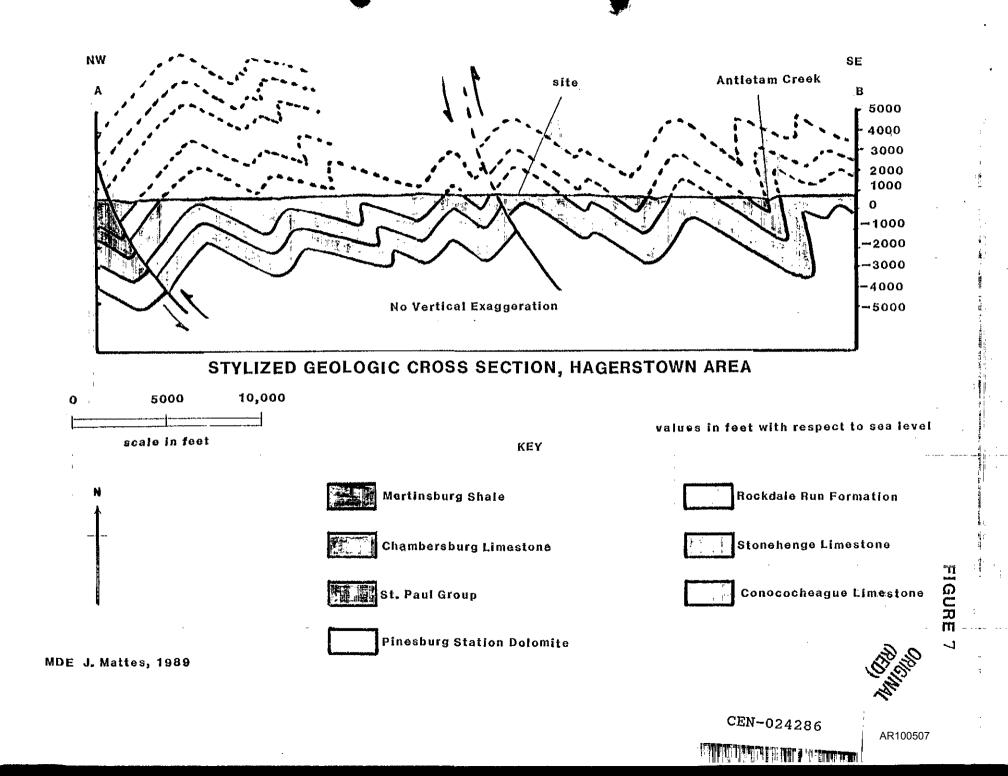
# FIGURE 6

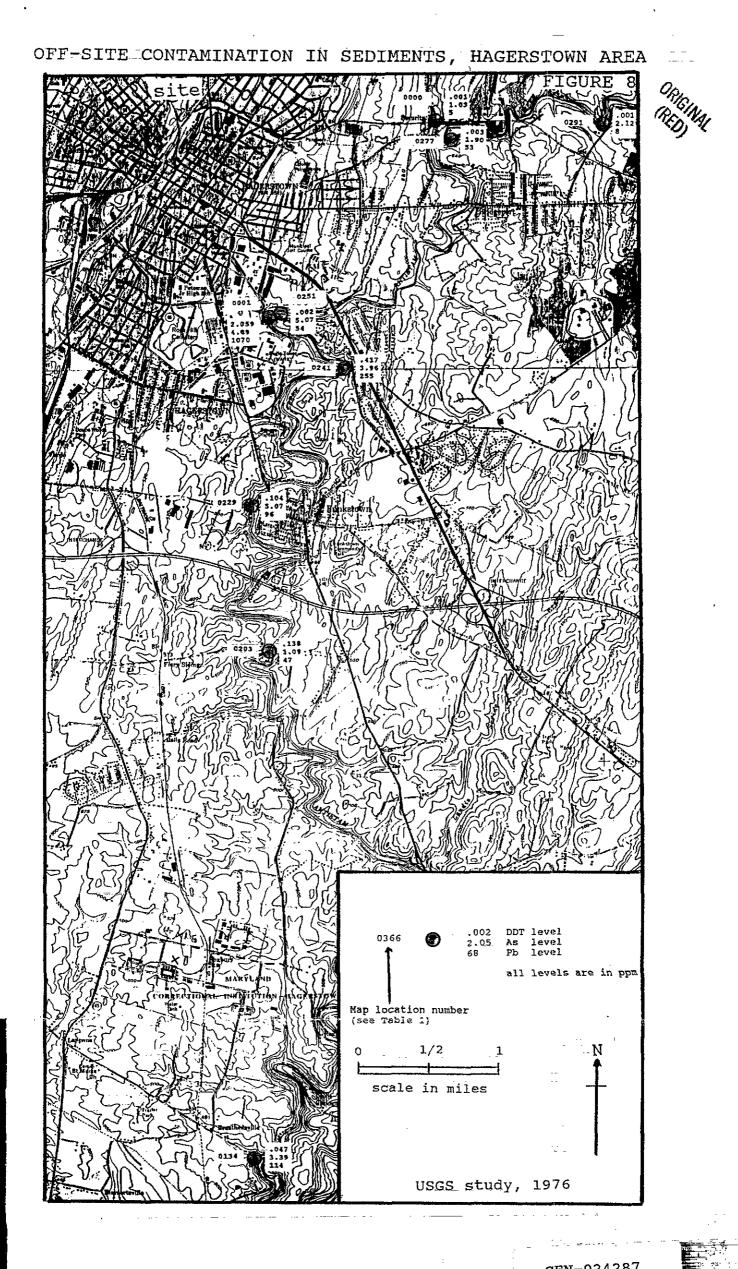
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# FRACTURE TRACES, CENTRAL CHEMICAL AREA





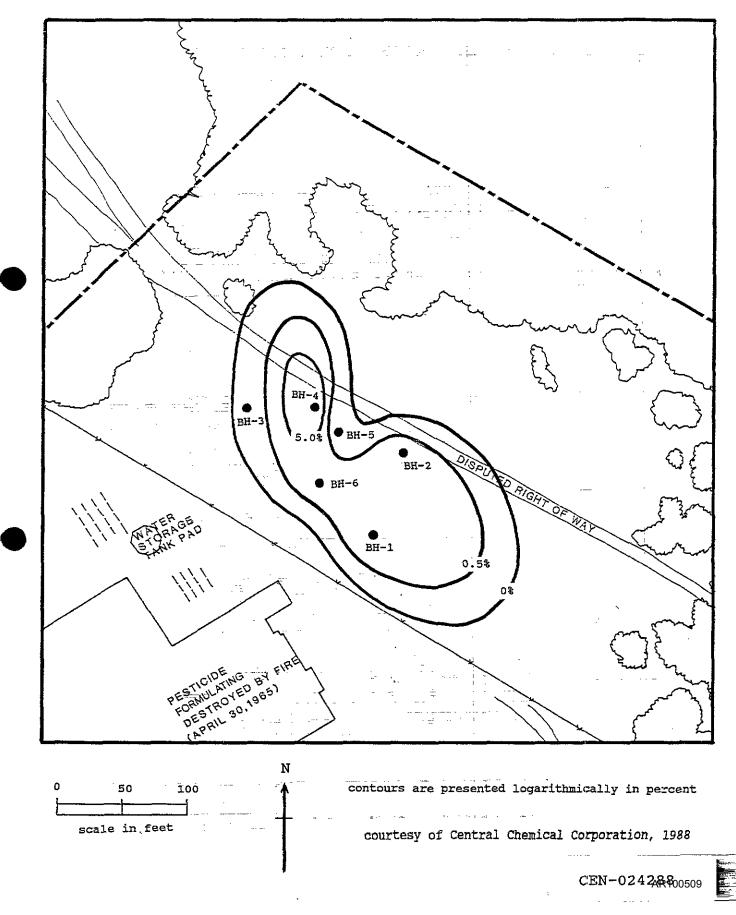


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DDT ANALYSIS RESULTS OF SOIL FROM DUMP AREA

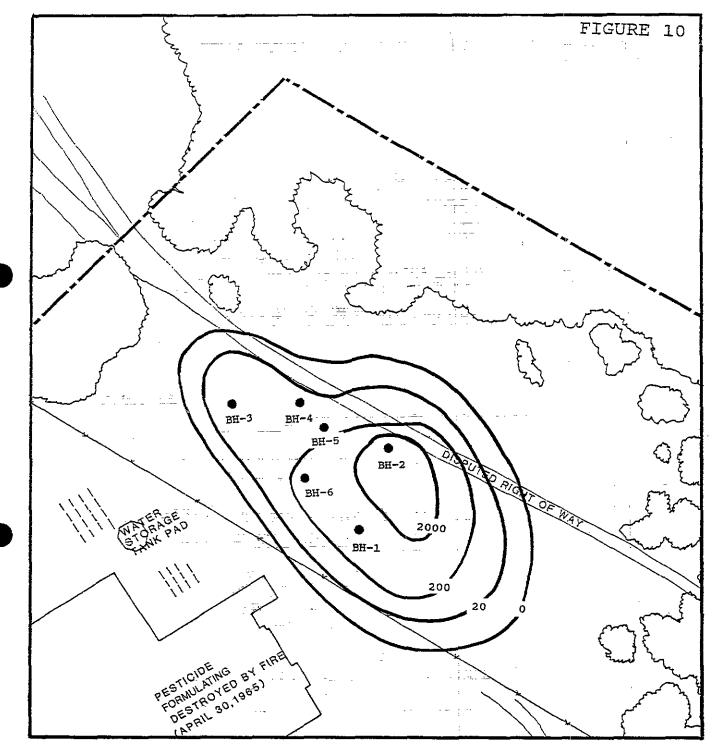


FIGURE 9

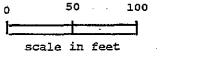




CHLOROBENZENE ANALYSIS RESULTS OF SOIL FROM DUMP AREA

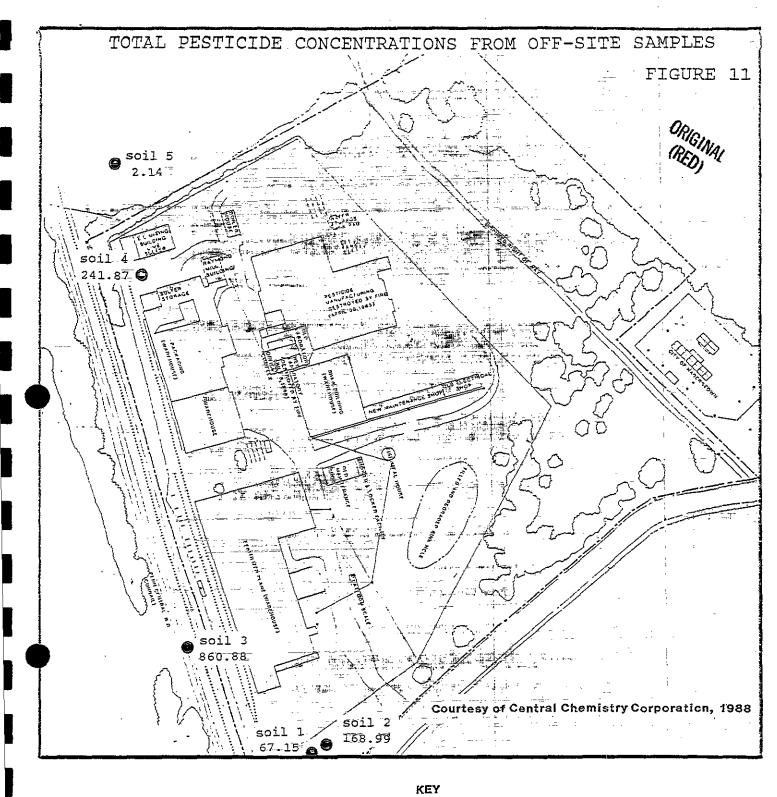


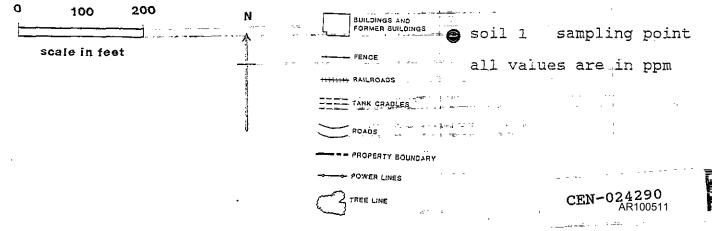
contours are presented logarithmically in ppb courtesy of Central Chemical Corporation, 1988

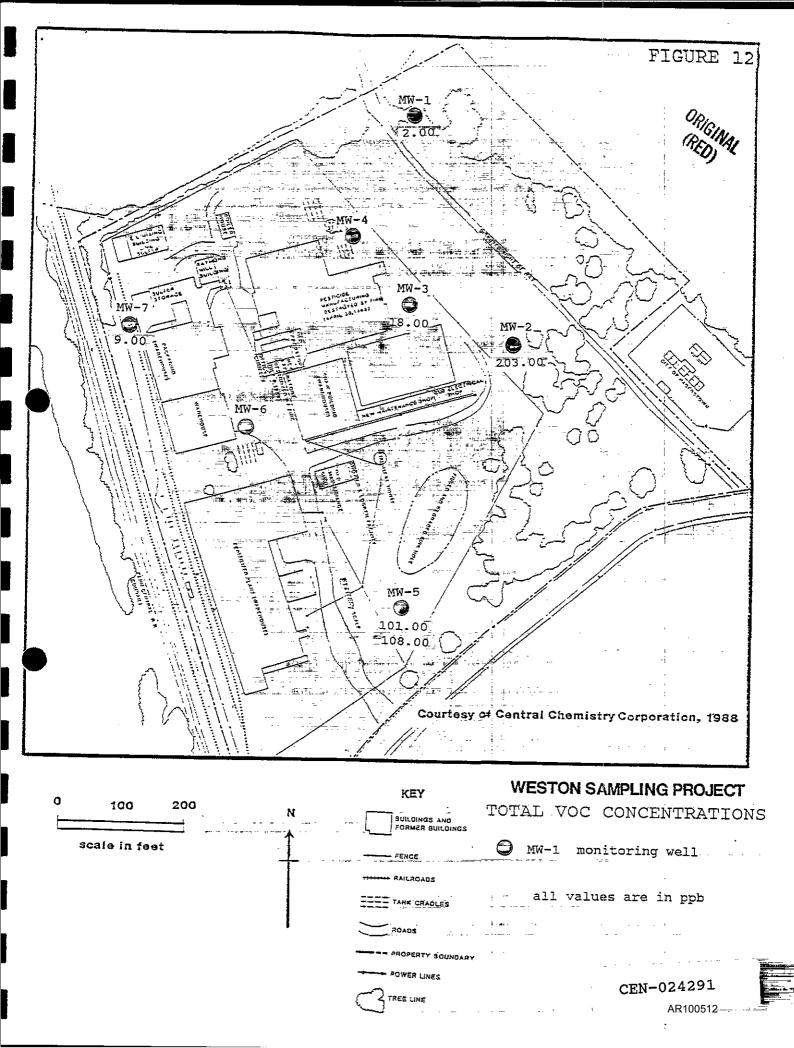


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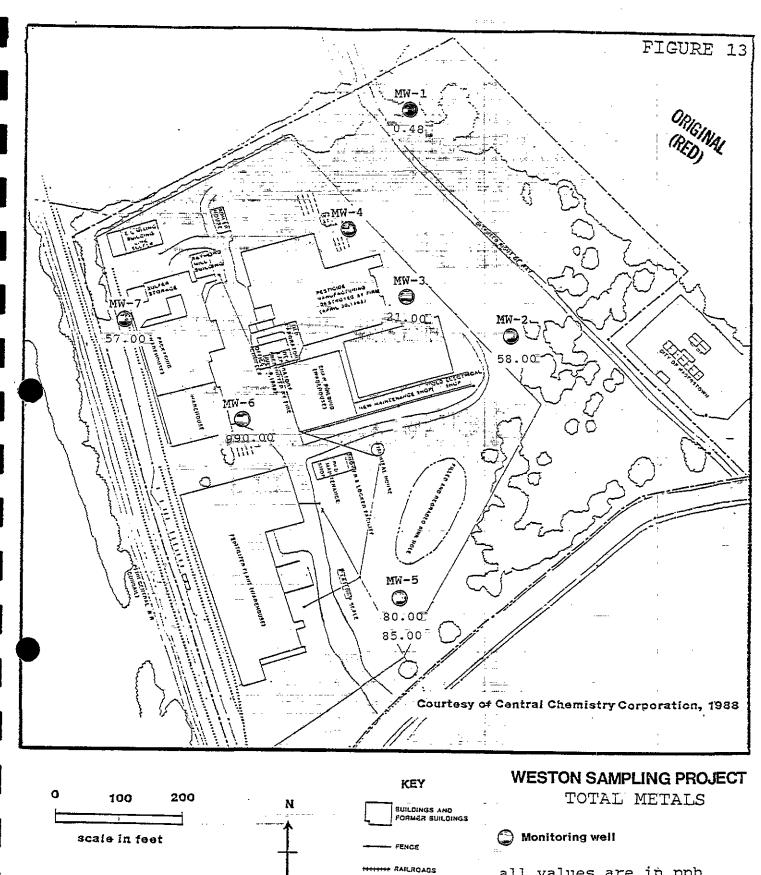
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all values are in ppb

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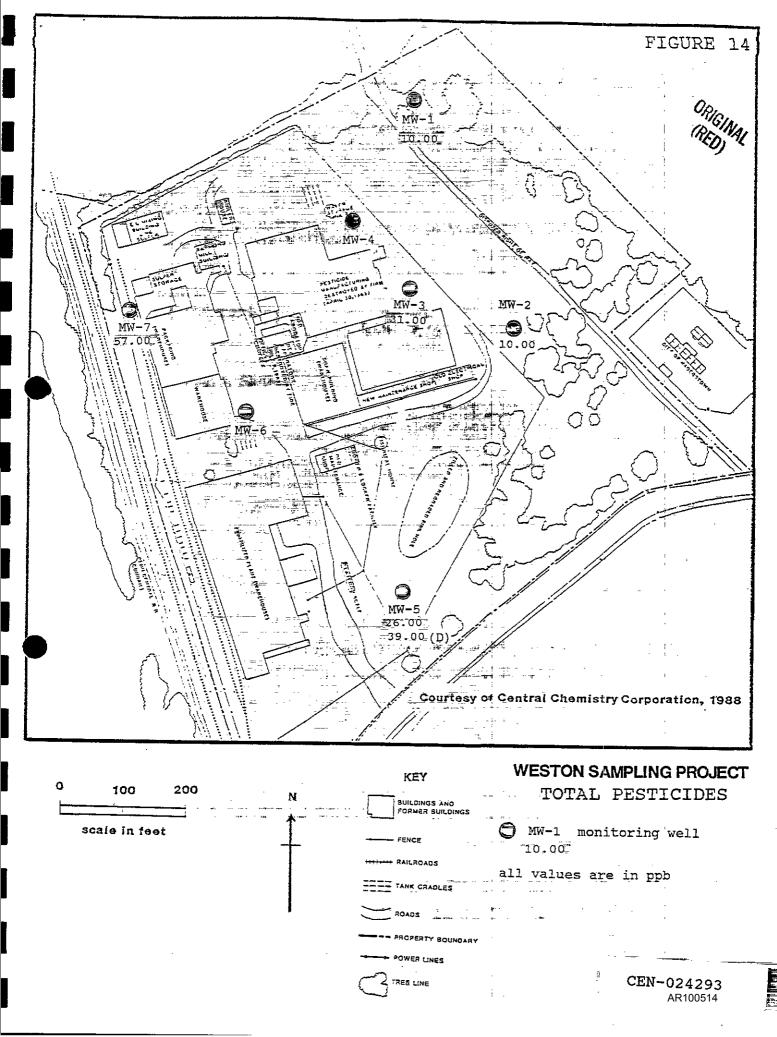
POWER LINES

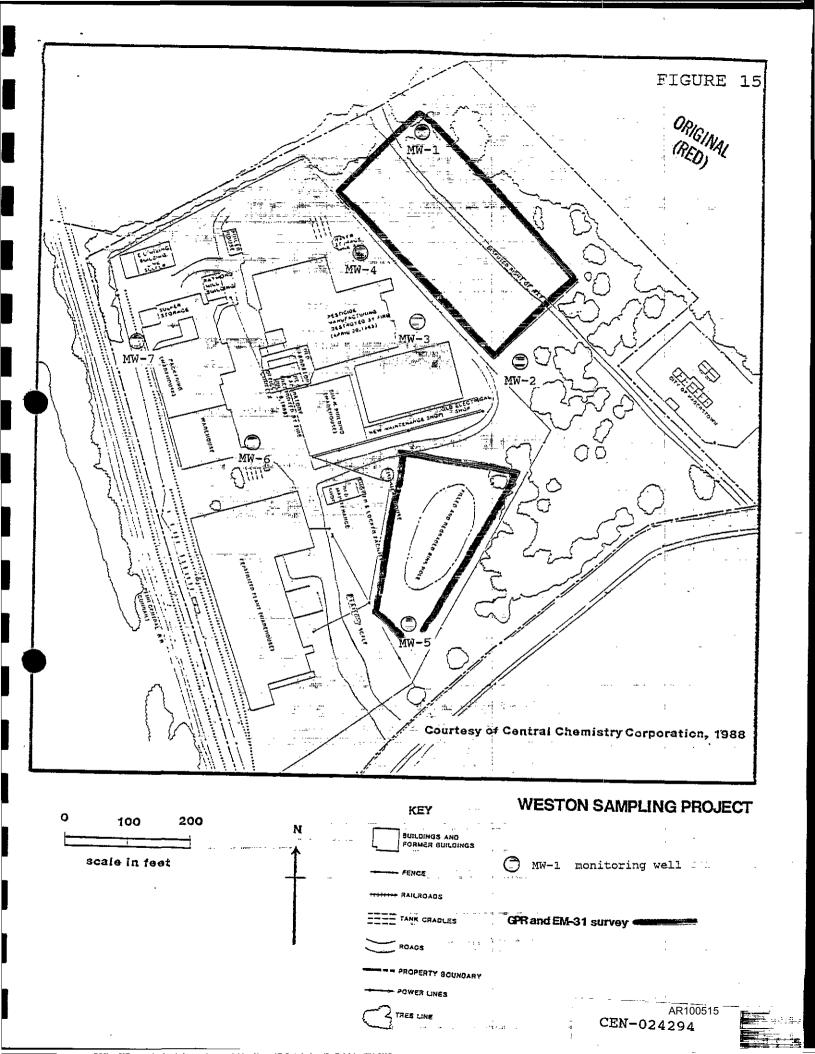
TANK GRADLES

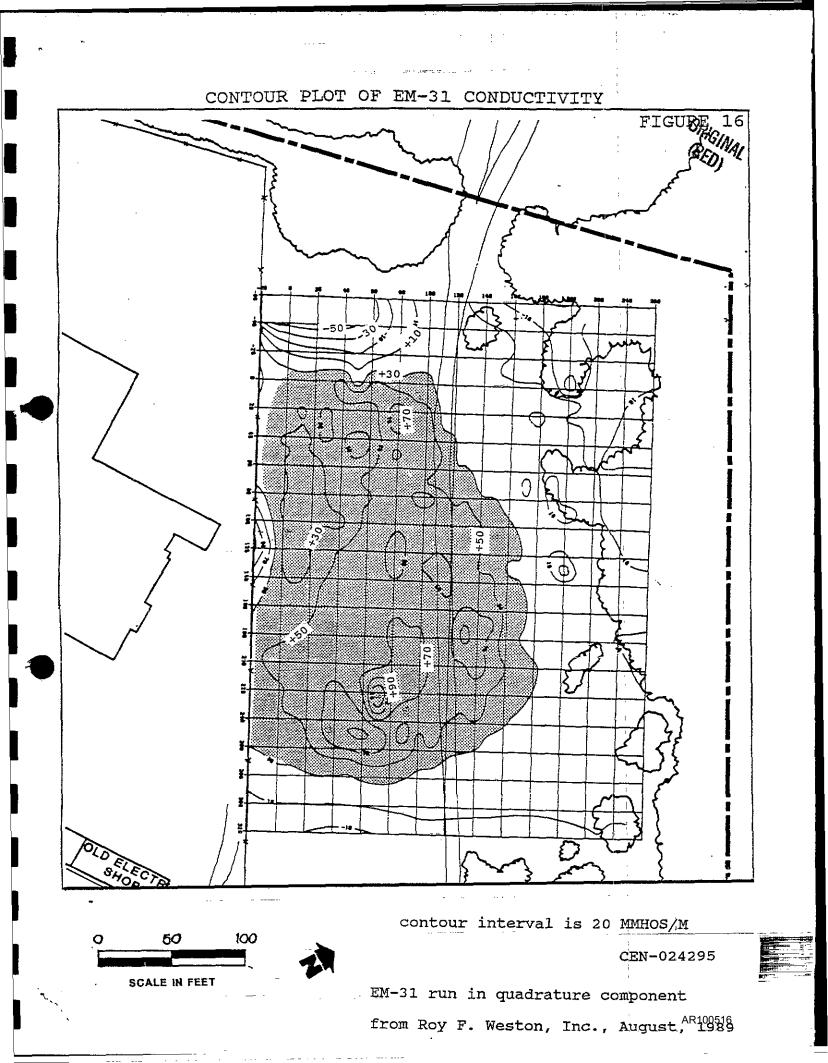
ROADS

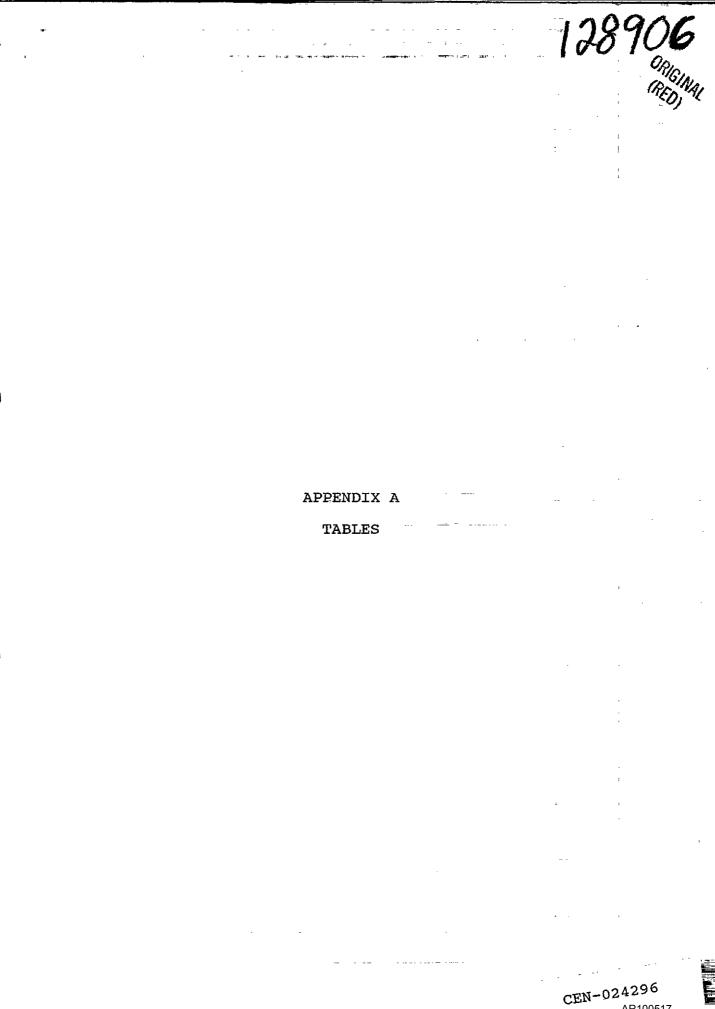
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CEN-02400 AR100517



#### 6/22/76

SAMPLE NO. (ppm)	Lead	Arsenic	DDT
1-ANT 0366	68.000	2.050	0.002
2-ANT 0291	8.000	2,120	0.001
3-ANT 0277	53.000	1.900	0.003
4-MRS 0000	5.000	1.030	0.001
5 ANT 0251	54.000	5.070	0.002
6-UAK 0001	1070.000	4.890	2.059
7-ANT 0241	255.000	3.960	0.417
8-ANT 0229	96.000	5.070	0.104
9-ANT 0203	47.000	3.090	0.138
10-ANT 0134	114.000	3.390	0.047
11-ANT 0044	36:000	4.090	0.003
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# Sediment samples collected off-site along Antietam Creek. Organics analyzed by TSD Chemical and Biological Investigations Laboratory. Metals analyzed by U.S. EPA at Annapolis Field Office.

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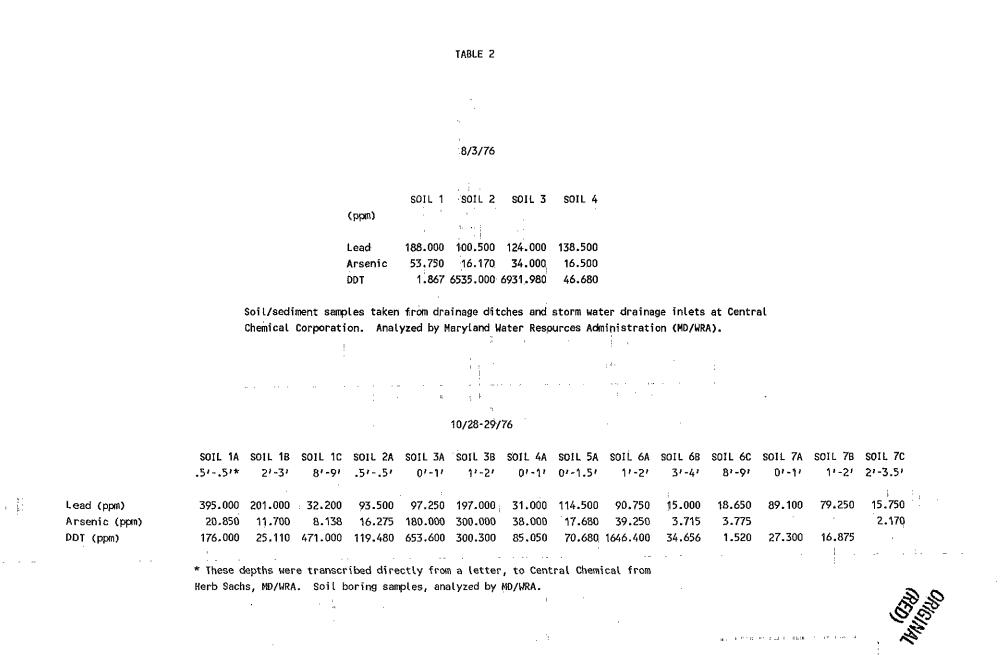
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BORING	DEPTH	OF SAMPLE			
A-1	0' to 1.5'	4.5' to 6.0'	8.0' to 9.5'	11.0' to 12.0'	
Total Lead Total Arsenic D.D.T.	68.6 41.0 117.2	35.0 71.1 0.41	7.5 77.5 *0.05	10.7 13.2 0.33	
A-3	0' to 2.0'	4.5' to 6.0'	8.0' to 9.5'	11.0' to 12.0'	
Total Lead Total Arsenic D.D.T.	1020.0 22.8 55.2	17.8 63.3 0.19	8.9 20.7 0.80	22.9 21.4 *0.05	
A-5	<u>0' to 2'</u>	4.5' to 6.0'	8.0' to 9.5'	11.0' to 12.0'	
Total Lead Total Arsenic D.D.T.	317.7 12.4 273.2	15.0 17.5 3.17	18.5 19.7 0.56	16.7 12.4 20.2	
A-7	0' to 2.0'	4.5' to 6.0'	8.0' to 9.5'	11.0' to 12.0'	
Total Lead Total Arsenic D.D.T.	41.0 13.3 2.72	16.3 11.6 0.29	10.4 9.8 *0.05	9.0 12.1 0.49	
8-2	<u>0' to 2.0'</u>	4.5' to 6.0'	8.0' to 9.5'	<u>11.0' to 12.0'</u>	
Total Lead Total Arsenic D.D.T.	16.4 20.3 1.26	_72.7 306.0 *0.05	4.4 12.7 0.22	10.8 12.9 0.15	
B-5 -	<u>0' to 2'</u>	4.5' to 6.0'	10' to 11.5'		•
Total Lead Total Arsenic D.D.T.	20.7 15.1 38.2	16.0 13.7 0.21	12.1 11.0 0.26	· · · · ·	
B-7 +80	<u>0' to 2.0'</u>	425' to 6.0'	8.0' to 9.5'	11.0' to 12.0'	
Total Lead Total Arsenic D.D.T.	75.0 20.4 392.9	31.2 15.7 14.5	12.5 12.7 28.0	4.6 3.9 0.27	

\* Less than

وحذجان وتأثير وتراجع والمناخر

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TABLE 3 (CONT.)

C-2	<u>0' to 1.5'</u>		. <u></u>	ORIGINAL (RED)	,
Total Lead	··· ··· 8.7	`	-	· · · · · · · · · · · · · · · · · · ·	
Total Arsenic	13.6				· ·
D.D.T.	1.55	······································			
0.0.1.	لندا				
C-3	0' to 1.5'				
Total Lead	20.7		,	1	
Total Arsenic	16.4		-		
D.D.T.	3.15				
0.0.1.	3.15				
C-3A 15' N.W	. of C-3	4.5' to 6.0'	8.0' to 9.5'	11.0' to 12.0'	
Total Lead		15.9	17.9	00.0	
Total Arsenic	· · · ·	- 17.1		88.8	
D.D.T.			11.9	. 156.0	
0.0.1.		4.8	0.23	0.83	
C-4	<u>0<sup>1</sup> to 2<sup>1</sup></u>	4.5' to 6.0'	8.0' to 9.5'	11.0' to 12.0'	,
Total Lead	61.0	39.0	10 C	10.0	•
Total Arsenic			10.6	16.9	
	23.6	13.8	12.0	9.4	
D.D.T.	160.0	17.1	5.26	16.0	
D-3	<u>0' to 1.5'</u>	· · · · · ·	• • • • • • •		
Total Lead	- 9.7				
Total Arsenic	12.2			· · · ·	
D.D.T.		•			
0.0.1.	0.96				
<b>O N</b>					•
D-4	<u>0' to 2.0'</u>	5.0" to 6.5"	8.0' to 9.5'	•	,
• • • • • • • • • • • • • • • • • • • •	n na				-
Total Lead	266.0	24.9	17.4		
Total Arsenic		21.1	16.2	•	
D.D.T.	124.0	178.0	27.3		
	• •				
D-6	<u>0.5' to 2'</u>	4.5' to 6.0'	•		. '
Total Lead	48.3	17.5			
Total Arsenic	12.1	63.3	,	· · · ·	
D.D.T.	2.15		· · · ·	•	
ې ۶ م سام سې	2.10	1.89	ι «		
D-6 + 25 25'	West of D-6	×	8.0' to 9.5'	<u>11.0' to 12.0'</u>	
Total Lead		· .	79 1	13.0	
Total Arsenic	· · · · · · · ·		78.0	12.4	
D.D.T.	•=	1	15.3	10.5	
W.U.I.		j <sup>a</sup> r	7.65	5.26	

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	TABLE	3	(CONT.)	
<u>0' to</u>	2.0'	• -:		

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	TAB:	LE 3 (CONT	• )	
D-7	<u>0' to 2.0'</u>	Na Ni Ni Companyan Suan	аны ан 	ORIGINAL (RED. AL
Total Lead Total Arsenic D.D.T.	254.0 9.2 100.0			
D-7A - 30' N.	W. of D-7	4.51 to 6.01	<u>8.0' to 9.5'</u>	<u>11.0'</u> to 12.0'
Total Lead Total Arsenic D.D.T.		16.7 8.4 0.95	12.5 16.5 0.72	13.7 16.8 3.08
D-8	0' to 2.0'			
Total Lead Total Arsenic D.D.T.	83.5 6.2 15.5	<b>.</b> .	'	ø
E-3	0 <sup>1</sup> to 2.0 <sup>1</sup>			1
Total Lead Total Arsenic D.D.T.	42.2 7.2 1.75	:		н - -
E-7-A - 30' N.	W. of E-7	5.0' to 7.5'	<u>15.0' to 20.0</u>	Auger Sample
Total Lead Total Arsenic D.D.T.		102.0 26.1 22	31.9 35.0 1404.	
E-8	<u>0' to 1.5'</u>	4.5' to 6.0'		
Total Lead Total Arsenic D.D.T.		53.0 17.5 122.5	· · · ·	
F-5	<u>0' to 2.0'</u>	4.5' to 6.0'	8.0 <sup>1</sup> to 9.5 <sup>1</sup>	
Total Lead Total Arsenic D.D.T.	10.9 11.0 25.0	28.7 20.9 0.70	54.0 4.9 0.82	· · · ·
G-4	0.5' to 2.0'	4.5' to 6.0'	8.0' to 9.5'	11.0" to 12.0"
Total Lead Total Arsenic D.D.T.	47.0 10.0 5.32	11.3 19.2 1.08	27.2 12.7 7.2	14.4 19.9 2.75
				-

Baker-Wibberly Hydrologic Investigation, 1977

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CEN-024302 AR100523

## TABLE 4 GROUNDWATER ANALYSES 5/16/77

Location

Monitoring Well A-5

Water Level 18 feet below ground level Total Lead Less than 0.05 parts per million Total Arsenic Less than 0.02 parts per million

D.D.T.

0.33 parts per billion

(0.00033 parts per million)

Location

Abandoned Quarry

Total Lead	Less	than	0.05	parts	per	million
Total Arsenic	Less	than	0.02	parts	per	million
D.D.T.			0.36.	parts	per	billion

(0.00036 parts per million)

Location

E-7A, Water Level 10 feet below ground level

Total Lead	Less than	0.05	parts	per	million
Total Arsenic		1.97	parts	per	million
D.D.T.		2.20	parts	per	billion.
	. (0.	0022	parts	per	million)

Baker-Wibberly Hydrologic Investigation, 1977

3/27/87	
:	SOIL 1
EP TOX ORGANICS	
Lindane	52 ppb
ORGANICS	:
Chlordane	424 ppm
Methoxychlor	9800 ppm
4,4-DDE	734 ppm
4,4-DDD	345 ppm
4,4-DD1	3700 ppm
Lindane	15 ppm
ORGANICS	
Chlorobenzene	16 ррп
(2-Butanone)	29. ppm
1,4-Dichlorobenzene	14 ppm
1,2-Dichlorobenzene	45 ppm

Soil samples taken from the dump area. Analyzed by MD/DHMH.

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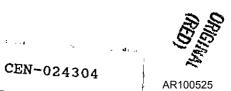
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4 ł. 10/25-26/88

	BH-1-4	BH-2-7	BH-3-5	BH-4-3	BH-5-7	BH-6-4	вн <del>-</del> 6-5	BH-2 AQ	BH-5 AQ	BH-2A/MD	BH-5A/MD
VOLATILES (ppb)		:		· 1	1		ı				
Methylene chloride									*50.0		
Acetone	i il	1	110.000						*26.D		
1,1-dichloroethane	: 1		:	4						2.000	
Chloroform	13.000			2.000				12.000		1.000	
Trichloroethene		e.	:	1	:					3.000	
Tetrachloroethene	*8.0		И	*7.0	· · ·	:					
Benzene	17.000		5.000		· · ·	• •			36.000	45.000	42.000
Toluene	11.000		31.000	3.000	이 같은 것이 안 한다.	5 E - 1				7.000	12.000
Chlorobenzene	1100.000	4600.000	100.000	41.000	34.000	34.000	720.000		4 <b>90.</b> 000	651.000	526.000
m-xylene	33.000	9200.000	110.000		5.000		450.000				i.
o&p-xylene	38.000	7500.000	150,000	· •	9.000	 	110.000	4			
1,3-dichlorobenzene	66.000	1200.000	17.000	6.000		14.000	790.000	27.000	21.000	:	
1,2-dichlorobenzene	1100.000	81000.00	<b>79.</b> 000	34.000	15.000	58.000	3300.000	270.000	900.000		:
1,4-dichlorobenzene	1200.000	1.80E+05	340.000	46.000	45.000	260.000	22000.00	630.000	340.000		
ethylbenzene	*8.0		53.000					46.000	97.000	42.000	87.000

Soil boring samples and water samples. Soil samples analyzed by Weston. Water samples split and analyzed by Weston and MDE.

\* indicates a result below exact quantification



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			10/25-26/8	88			
	8H-1-4	BH-2-7	BH-3-5	BK-4-3	BH-5-7	BH-6-4	BH-6-5
SEMI-VOLATILES (ppm)	2 1 1 1 1		9				( ) (
1,4-dichlorobenzene	0.820	66,000	0.870	47.000	4.500	*0.160	*4.000
1,2-dichlorobenzene	*1.200		1		.1.400		÷
Acenaphthene			*0.310	l			<i>1</i>
Fluorene	÷.1		*0.350			1.5	
1,2,4-trichlorobenzene	40.000	210.000	*0.420		2.800	6.100	12.000
Naphthalene		*3.700	19		0.870	1	8 j. j.
Pentachlorophenol	े मह	Å			*0.830		
Phenanthrene	si a qi	*8.400	1.700	4 · · · ·	0.500	5.4	· 1
Fluoranthene	: '¶ })⊮∎ ,	*3,000	1.000		*0.200		ı. I
Benzo(b)fluoranthene		1 Å 1			*0.056		
Benzo(a)pyrene			ll E	1	*0.091	· · ·	:
Pyrene		l i			*0.180		
Chrysene		ت ۲. ا	· '		*0.150		
Anthracene		1945 y 1946 y	*0.300		*0.061		:
Bis(2-ethylhexyl)phthalate		*5.900	l.	1		· .	5
Di-n-butylphthalate	*11.000	*2.600	*0.220			*0,880	*1.400
* indicates a result below ex	kact quantif	ication				·••	
	4 *			· 41.		1	i
INORGANICS (PPM)				a an a		1	į.,
Arsenic	9.200	171.000	313.000	191.000	5.800	58.900	137.000
Beryllium	1.4		2.300	4   4			ų,
Chromium	10.500	46.600	32.200	31,100	10.600	7.700	17.300
Copper	181.000	297.000	23.400	319i <b>.</b> 000	20.600	126.000	258.000
Nickel	.!	,	30.000	39,100	10.700	12.200	21.800
Lead	50.800	· · ·	14.200	14.300	18.200		
Zinc	62 <b>.</b> 100 <sup>1</sup>	392.000	102.000	655 <sub>1</sub> .000	52.700	169.000	646.000
* indicates a result below ex	kact quantif	ication 、			ι		
					· · ·		
PESTICIDES (ppm)			1		!	-	
Alpha-BHC	110.000						
Beta-BHC	-		*790.00	H			
Delta-BHC	260.000			1			
4,41-DDE		390,000	130.000	840.000	*57.000	*140.000	*1200.00
4,41-DDD	*140.000	2100.000	*12.000	22000.00	*32.000	*120.000	*370.000
4,44-DDT	6700.000			76000.00		1900.000	
* indicates a result below e							
·	· · · · · ·						

Soil boring samples. Analyzed by Weston.

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		4/27/89			
	SOIL 1	SOIL 2	SOIL 3	SOIL 4	SOIL 5
PESTICIDES (ppm)			40 		
DDT .	43,000	150.000 0.860	798.000	159.000	0.730
DDE	16.000	8.100	43.000	7.800	1.300
Chlordane	7.300	8.800	15.000	31.000	
Alpha-BHC	0.160	0.220	1.000	2.500	0.021
Beta-8HC	0.330	0.520	2.500	1.000	0.076
Gamma-BKC (Lindane)	0.050	0.100	0.460	0.370	0.013
Delta-BHC	0.040	0.110	0.570	0.200	
Endrin	0.270	0.280	0.270	40.000	
TOTAL PESTICIDES	67.150	168,990	860.800	241.870	2.140

#### Soil/sediment samples taken on and off site. Analyzed by MD/DHMH.

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	5/17/89	5/17/89	5/17/89	5/18/89	5/18/89	5/18/89
	MW-1	MW-6	MW-7	`M₩-2	MW-3	MW-5
		e.	1	1	i <sub>B</sub>	
	· i		ļ.,			
VOLATILES (ppb)		1		Υ. L	1 4 1 4 5	
1						
1,1-dichloroethane	I		2.000		1	• [1]
Chloroform	2,000	21000	12.000	1	, 	1
1,1,1-trichloroethane	1.000	1				
1,2-dichlorobenzene	2.000	2.000				
Chlorobenzene	1.000	1.000		182.000	111000	109.000
Benzene	.			19,000		14.000
Ethylbenzene				5.000		
Total xylenes				4.000	en l	· · ·
Acetone			1 1	168.000	1 I I 1 I	
Isopropyl alcohol			1. A. A.	250.000		· · · ·
		iat i	l	<sup>11</sup>		
INORGANICS (ppm)	4. -				1, 4, 1	
· .	. 1				·	
Arsenic	N/A	0.003	N/A	0.010		
Calcium	N/A	610,000	N/A	640.000	275.000	520.000
Copper	NZA	0.060	N/A		p	
Mercury	· N7A	. 1	N/A	0.001	-	
	1					÷
PESTICIDES (ppb)						:
					i	
Alpha-BHC	0.800	1.000	3,000	0.500	3,000	8.000
Beta-BHC	2.000	2,000	40.000	5.000	7.000	4.000
Gamma-BHC (lindane)	0.100	0,200	1.000			3.000
Delta-BHC	3.000	0.500	8.000	12.000	10.000	9.000
Dieldrin	6.000	0.400	3,000			
Endrin	:		3,000			

Groundwater samples, split with Weston. Analyzed by MDE. N/A - Not Analyzed.



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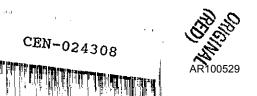
### CEN-024307

				5/17-18/8	9		
VOLATILES (ppb) Chloroform	MW-1	M₩-2	₩ <b>-</b> 3	MW-5	MW-5(D)	MW-6	MW-7 8,600
Benzene		16.000	1.100	8.400	8.700		
Toluene		1,,300			•		
Chlorobenzene	i	150.000	8.800	74.000	80.000		· . · ·
Total xylene	1	2.100		1.000	1.100	:	: :
1,2-dichlorobenzene	2,200	6.900	1,900	5.800	5.200	i	÷ ,
1,4-dichlorobenzene	ļ	22,000	6.100	12.000	13.000	1	
Ethylbenzene	1	4.600				1	
TOTAL VOLATILES	2.200	202.900	17,900	101 200	108.000		8.600
iona vornielo	LILOU	LOL	11.200	101.200	1001000		0.000
INORGANICS (ppb)	ł	•	5	4	, Ē		
Beryllium		. I	ļ.	1. j		38.300	1
Cadmium						5.000	
Copper		33.800	<u>। वि</u>	25.500	27.100	55,900	
Mercury	0.480			· ·			· ·
Nickel	•	*1			$   _{\mathcal{L}_{2}} \leq     _{\mathcal{L}_{2}} \leq     _{\mathcal{L}_{2}} \leq     _{\mathcal{L}_{2}} \leq      _{\mathcal{L}_{2}} \leq                                   $	379.000	
Zìnc		23.700	20.800	54.300	57.500	512.000	56.800
			1	i, I		:	:
TOTAL INORGANICS	0.480	57.500	20,800	79.800	84.600	990.200	56.800
					ii ii		.,
PESTICIDES (ppb)	t	i	<u> </u>				4
Alpha-BHC		· .	3,900	12.000	23.000		
Beta-BHC	2.400		7.800				57.000
Delta-BHC	2.400	9.500	19.000	14.000	16.000		
Dieldrín	5.600		4				1
TOTAL PESTICIDES	10.400	9.500	30.700	26.000	39.000	T	57,000

Groundwater samples, split with MDE. Analyzed by Weston. (D) - duplicate.

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#### APPENDIX B

#### SAMPLE RESULTS

CEN-0248109530



Antietam Creek Survey - June 1970

TABLE I

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AFO Sample No.	Location	Date Sampled	Time Sampled	As PPM	Cd PPM	Cr PPM	- РЬ РРМ-	Hg PPM	DDT PPM	DDE PPM	DDD PPM	РСВ 1254 РРМ	Chloro- dane PPM	Diel drin PPB
76062233	Antietam Cr. at USGS Gage Sta. near Md/Pa. line	6-22-76	1015	2.05	<1.0	27,0	68	0.5	.002	.000	.002	<.010	.015	<1.0
76062232	Antietam Crat Hagerstown, below trib next to Trovinger Rd.	6-22-76	1100	2.12	<1.0	11.0	8	<0.1	.001	.020	< <b>,000</b>	<,010	<.010	<1.0
76062231	Antietam Cr. at Hagerstown, above Marsh Run	6-22-76	1130	1.90	· <1.0	22.0	53	0.5	.003	.001	.001	<.010	<.010	<1.0
76062235	Marsh Run at confluence with Antietam Cr.	6-22-76	1150	1.03	8.0	80.0	5	0.6	.001	.000	.000	<.010	<.010	<1.0
76062230	Antietam Cr. at Hagerstown, bridge at Power Sta.	6-22-76	1300	5.07	2.0	34,0	54	0,8	.002	.001	.001	<b>&lt;.010</b>	<.010	<1.0
76062234	Unknown Trib at Hagerstown above Power Plant Effl. pipe	6-22-76	1250	4.89	2.0	35.0	1070	1.5	2.059	.018	.206	<.010	<.010	<1.0
76062229	Antietam Cr. at Hagerstown, US 40 by pumping sta.	6-22-76	1315	3.96	5.0	50.0	255	0.2	•417	.011	.074	<.010	<.010	<1.0
76062228	Antietam Cr. at Ridge Rd., Funkstown, Md.	6-22-75	1300	5.07	.2.0	29.0	96	0.3	.104	.003	.010	<.010	<.010	<1.0
76062227	Antietam Cr. at Poffenberger Rd.	6-22-76	1200	3.09	1.0	31.0	47	0.3	.138	.007	.068	<,010	<.010	<1.0
76062226	Antietam Cr. at Devils Backbone Co. Park	6-22-75	1115	3.39	5.0	41.0	114	0.3 ·	.047	.003	.011	<.010	<.010	<1.0
76062225	Antietam Cr. at Burnside Bridge	6-22-76	1030	4.09	1.0	30.0	36	0,5	.003	.001	.005	<.010	<.010	<1.0
-	Sample No. 76062233 76062232 76062231 76062235 76062230 76062234 76062229 76062228 76062228 76062228	Sample No.Location76062233Antietam Cr. at USGS Gage Sta. near Md/Pa. line76062232Antietam Cr. at Hagerstown, below trib next to Trovinger Hd.76062231Antietam Cr. at Hagerstown, above Marsh Run76062235Marsh Run at confluence with Antietam Cr.76062230Antietam Cr. at Hagerstown, bridge at Power Sta.76062234Unknown Trib at Hagerstown above Power Plant Effl. pipe76062229Antietam Cr. at Hagerstown, bridge at Power Sta.76062229Antietam Cr. at Hagerstown, bridge Rd, Brunkstown, Md.76062227Antietam Cr. at Ridge Rd, Funkstown, Md.76062227Antietam Cr. at Poffenberger Rd.76062226Antietam Cr. at Devils Backbone Co. Park	Sample No.LocationSampled76062233Antietam Cr. at USGS Gage Sta. near Md/Pa. line6-22-7676062232Antietam Cr. at Hagerstown, below trib next to Trovinger Rd.6-22-7676062231Antietam Cr. at Hagerstown, above Marsh Run6-22-7676062235Marsh Run at confluence with Antietam Cr.6-22-7676062230Antietam Cr. at Hagerstown, bridge at Power Sta.6-22-7676062234Unknown Trib at Hagerstown above Power Plant Effl. pipe6-22-7676062229Antietam Cr. at Hagerstown, bridge at Power Sta.6-22-7676062229Antietam Cr. at Hagerstown, bridge Rd, Funkstown, Md.6-22-7676062227Antietam Cr. at Ridge Rd, Funkstown, Md.6-22-7676062227Antietam Cr. at Poffenberger Rd.6-22-7676062227Antietam Cr. at Devils Backbone Co. Park6-22-76	Sample No.LocationSampled Sampled76062233Antietam Cr. at USGS Gage Sta. near Md/Pa. line6-22-76101576062232Antietam Cr. at Hagerstown, below trib next to Trovinger Rd.6-22-76110076062231Antietam Cr. at Hagerstown, above Marsh Run6-22-76113076062235Marsh Run at confluence with Antietam Cr.6-22-76115076062230Antietam Cr. at Hagerstown, bridge at Power Sta.6-22-76130076062234Unknown Trib at Hagerstown above Power Plant Effl. pipe6-22-76135076062228Antietam Cr. at Ridge Rd, Funkstown, Md.6-22-76130076062227Antietam Cr. at Ridge Rd, Funkstown, Md.6-22-76131576062226Antietam Cr. at Poffenberger Rd.6-22-76130076062226Antietam Cr. at Devils Backbone Co. Park6-22-761315	Sample No.         Location         Sampled Sampled PPM           76062233         Antietam Cr. at USGS Gage Sta. near Md/Pa. line         6-22-76         1015         2.05           76062232         Antietam Cr. at Hagerstown, below trib next to Trovinger Rd.         6-22-76         1100         2.12           76062231         Antietam Cr. at Hagerstown, above Marsh Run         6-22-76         1130         1.90           76062235         Marsh Run at confluence with Antietam Cr.         6-22-76         1150         1.03           76062230         Antietam Cr. at Hagerstown, bridge at Power Sta.         6-22-76         1300         5.07           76062234         Unknown Trib at Hagerstown above Power Plant Effl, pipe         6-22-76         1315         3.96           76062229         Antietam Cr. at Ridge Rd, a Funkstown, Md.         6-22-76         1300         5.07           76062229         Antietam Cr. at Ridge Rd, a Funkstown, Md.         6-22-76         1300         5.07           76062229         Antietam Cr. at Poffenberger Rd.         6-22-76         1300         5.07           76062227         Antietam Cr. at Poffenberger Rd.         6-22-76         1300         5.07           76062226         Antietam Cr. at Devils Backbone Co. Park         6-22-76         1200         3.09	Sample No.         Location         Sampled Sampled Sampled PPM         PPM           76062233         Antietam Cr. at USGS Gage Sta. near Md/Pa. line         6-22-76         1015         2.05         <1.0	Sample No.         Location         Sampled Sampled Sampled PPM         PPM         PPM           76062233         Antietam Cr. at USGS Gage Sta. near Md/Pa. line         6-22-76         1015         2.05         <1.0	Sample No.         Location         Sampled Sampled Sampled PPM         PPM         PPM         PPM         PPM           76062233         Antietam Cr. at USGS Gage Sta. near Md/Pa. line         6-22-76         1015         2.05         <1.0	Sample No.         Location         Sampled Sampled Sampled PPM         PDM         PDM         PDM	Sample No.         Location         Sampled Sampled Sampled PPM         PDM         PDM         PDM	Sample No.         Location         Sampled Sampled Sampled PPM         PPM	Sample No.         Location         Sampled Sampled Sampled PPM         PPM	AFO Sample No.         Location         Date Sampled Sampled Sampled PPM         Cd PPM         Cr PPM         PB PPM         DDT PPM         DDE PPM         DDE PPM         DDE PPM         PPM         PDM         PDM         PDM	AFO Sample No.         Location         Date Sampled Sampled Sampled Sampled Sampled         Cd PPM         Cr PPM         Pb PPM         Hg PPM         DDT PPM         DDT PPM



AR100531

CEN-024310

HERBERT M. SACHS



STATE OF MARYLAND DEPARTMENT OF NATURAL RESOURCES WATER RESOURCES ADMINISTRATION TAWES STATE OFFICE BUILDING ANNAPOLIS, MARYLAND 21401

#### MEMORANDUM

TO: Bob Creter

FROM: Rich Steimle

DATE: December 29, 1976

On October 21, 1976 I met with Bob Boone to discuss a subsurface investigation of the possible contamination of soil by insecticides from the Central Chemical Company, Hagerstown, Maryland. The plant manufactures agricultural fertilizers now, but manufactured pesticides previously. It was determined that a series of borings be conducted to obtain soil samples at various depths and locations for the purpose of further understanding the problem.

On October 28 and 29, 1976 the Groundwater Investigating Group conducted a series of borings and obtained split spoon samples. The soil samples were taken to the W.R.A. laboratory to be analysed for DDT, arsenic and lead. The predominant soils consists of silts and clays with rock fragments. The area is underlain by limestone.

The analysis revealed lead concentrations ranging from 395.0 ppm to 14.75 ppm, arsenic from 300.0 ppm to 2.17 ppm and DDT from 1,646.4 ppm to 0.179 ppm.

The limits established by the U.S.P.H.S. for drinking water standards are 0.05 for both arsenic and lead. In view of the fact that the soils on and near the Central Chemical Company property contains lead and arsenic concentrations far exceeding these limits, I feel a serious ground and surface water contamination problem probably exists due to the leaching of the soil by precipitation.

Geologically speaking, this region lies in a limestone area which is a valuable, productive water-bearing rock. This rock is extremely susceptible to contamination due to the relatively large voids and fractures in the rock of which groundwater moves freely with very little chance of filtration or attenuation. Therefore, contaminated groundwater may be found great distances from the source.

I recommend a thorough hydrogeologic investigation be conducted by a competant, private engineering firm. The investigation should include an extensive soil sampling program to define and ascertain the extent of the contamination. A proposal should also be submitted for the possible solution of the problem, i.e. removal of the soil. All plans should be submitted to W.R.A. for review and approval before implementation. An investigation should also be conducted to determine the possible contamination of nearby wells.

> CEN-024311 AR100532



I stress the urgency of expedience due to the toxic nature of the contaminents and the relatively large concentrations, therefore deadlines should be set for each step toward the solution. PED)

If you have any questions feel free to call me at 269-2780.

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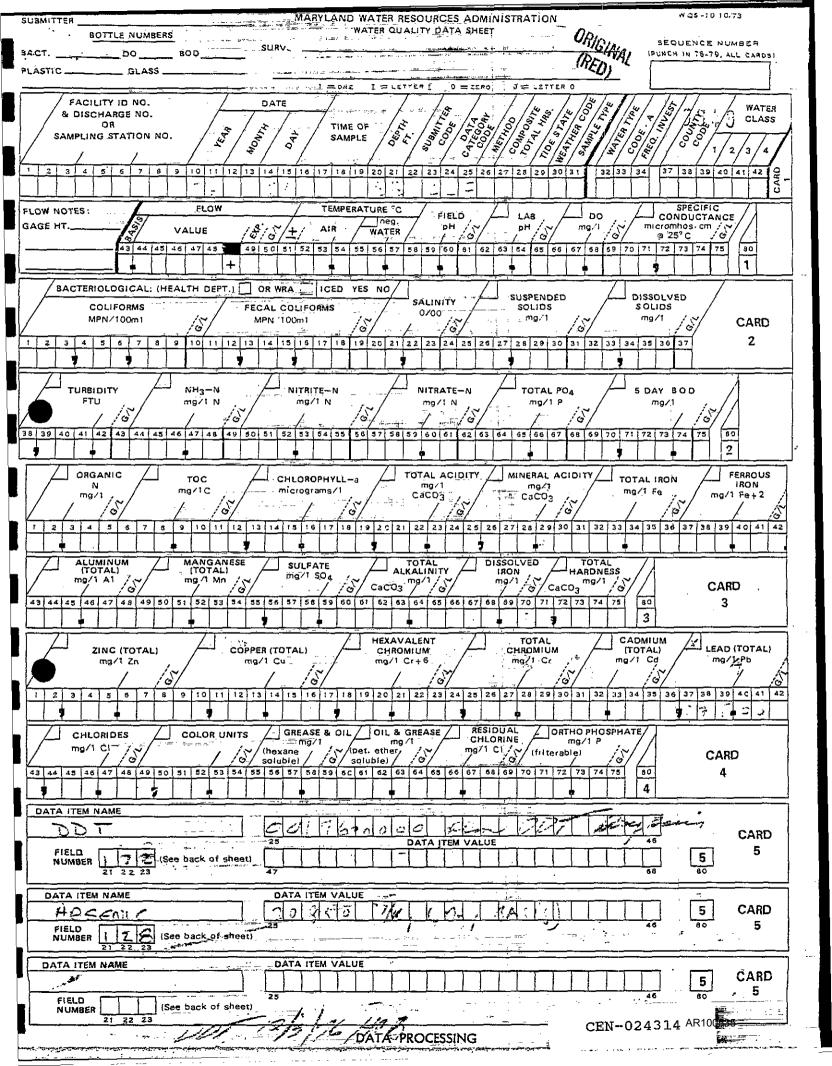
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RS:dlk

cc: J. Lewandowski A. Schiffman

Samples were taken as follows: SAMPLE POINT 1 - located in the lowest area in the southeast corner of the property. Sample #1A -  $\frac{1}{2} - \frac{1}{2}'$ #1B - 2'-3' #1C - 8'-9' SAMPLE POINT 2 - located inside the fence line on the western side of the property near the liquid storage area. Sample #2A - ½'-½' \_\_\_\_\_ SAMPLE POINT 3 - located outside the fence line on the southeast corner of the porperty near the shipping area. Sample #3A - 0'-1' #3B - 1'-2' . . . . . . . . SAMPLE POINT 4 - located outside the fence on the western side near the grinding and dust packing area. Sample #4A - 0'-1' SAMPLE POINT 5 - located at the northern corner at the highest point on the property. This sample was taken as a possible unaffected background sample. Sample #5A - 0'-12' #5B - 21/2'-31/2' SAMPLE POINT 6 - located outside the fence at the edge of a private landfill containing rubble from insecticide buildings destroyed in a fire. · . · · · · · Sample #6A - 1'-2' #6B - 3'-4' #6C - 8'-9' SAMPLE POINT 7 - located along edge of Mitchell Avenue, south of the plant, where surface drainage enters public storm drains. Sample #7A - 01-11 #7B - 1'-2' #7C - 2'-31/2'





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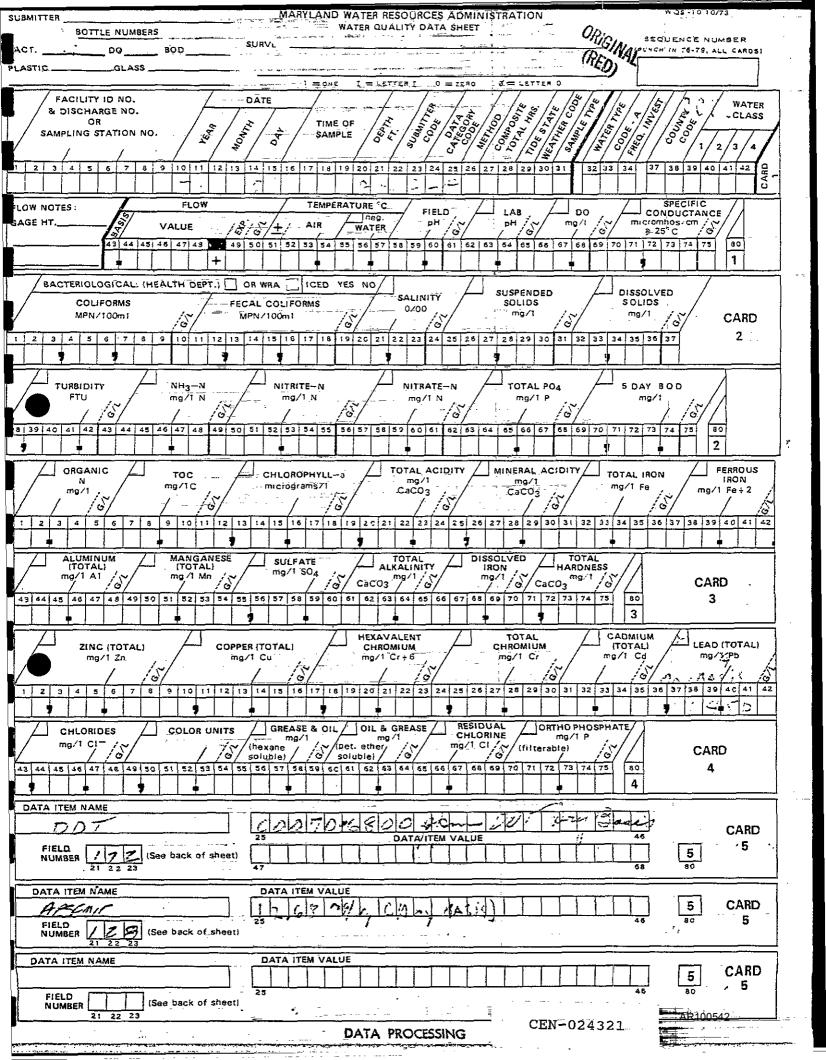
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ORGANIC	TOTAL ACIDITY MINERAL ACID		FERROUS
N mode		mg/1 F	
	$caco_3$ $\sim$ $caco_3$ $\sim$	1 1	a mg/1 Fe+2
<u><u></u><u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u>	3 14 15 16 17 18 19 2 2 21 22 23 24 2 5 26 27 28 29 30 3	1 32 33 34 39	<u> </u>
		1 22 33 34 33	
ALUMINUM (TOTAL) (TOTAL)	SULFATE TOTAL DISSOLVED H	TOTAL ARDNESS	
mg/1 A1 / mg/1 Mn / Mn	$\frac{mg}{3}$	mg/1 /S/	CARD .
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	<u>+     +       + +     +   +   +   +   +</u>	3	
<u> </u>	/ HEXAVALENT / TOTAL	CADMI	
	ER (TOTAL) CHROMIUM CHROMIUM CHROMIUM mg/1 Cr ,	mg/1 C	
	test the test of the test		
			$\frac{3}{36}$ $\frac{37}{38}$ $\frac{39}{39}$ $\frac{4}{40}$ $\frac{41}{42}$
	3 14 15 16 17 16 19 20 21 22 23 24 25 26 27 28 29 30 3		
│ <u>┝─└───────────────────────────────────</u>			
CHLORIDES COLOR UNITS	ma/1 CHLORINE / ma	PHOSPHATE	
mg/1 C1-15-15	(hexane / / (bet, ether / / mg/1 Cl / / (filterable soluble) / 0 soluble) / 0		CARD
	5 36 37 58 59 5C 61 62 63 64 65 66 67 68 69 70 71 72		4
		4	· ·
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Alectic	21×10001012 1 6 4 1 144111		5 CARD
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21 22 23			
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SUBMITTER		WQ3-101073
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BACT DO BOD SURV	- AL	PLACH IN TOTTE, ALL CARDEN
PLASTIC GLASS	(O) *	SEQUENCE NUMBER
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	31 32 33 34	37 28 20 40 41 42 0
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	<b>∔</b>	9 1 1
BACTERIOLOGICAL: (HEALTH DEPT.)	71	
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ETU / mg/1 N / mg/1 N / mg/1 N / mg/1 P	- /	mazi //
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mg/1 mg/1C micrograms/1 CaCO3 CaCO3	~/ /	re mg/l Fe+2
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$\frac{mg/1}{\omega}$ AI $\frac{mg/1}{\omega}$ Mn $\frac{mg/1}{\omega}$ SO <sub>4</sub> $\frac{mg/1}{\omega}$ CaCO <sub>3</sub> $\frac{mg/1}{\omega}$ $\frac{mg/1}{\omega}$ CaCO <sub>3</sub> $\frac{mg/1}{\omega}$ CaCO <sub>3</sub> $\frac{mg/1}{\omega}$ CaCO <sub>3</sub> $\frac{mg/1}{\omega}$ $\frac{mg/1}{\omega}$ CaCO <sub>3</sub> $\frac{mg/1}{\omega}$ $\frac{mg/1}{\omega}$ CaCO <sub>3</sub> $\frac{mg/1}{\omega}$ $\frac{mg/1}{\omega}$ $\frac{mg/1}{\omega}$ $\frac{mg/1}{\omega}$ CaCO <sub>3</sub> $\frac{mg/1}{\omega}$	03 <sup>mg/1</sup> /0//	CARD
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CHLORIDES COLOR UNITS COLOR UNITS COLOR CO	HOPHOSPHATE	1
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SUBMITTER MARYLAND WATER RESOURCES ADD		WQS-10 10/73
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PLASTIC GLASS	TED, M	[]
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OR TIME OF THE O	100 Control Co	CLASS
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		<b>U</b>
FLOW NOTES. FLOW TEMPERATURE 'C FIELD		SPECIFIC
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S/ 10/0/1/ MATCH - 1.40/	1 6 1 10	<u>◎ 25°C</u>
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		*      1
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	mg/1 IUIAC	IRON IRON
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ALUMINUM AMANGANESE SULFATE ALKALINITY	DISSOLVED TOTAL	1
mg/1 A1 / mg/1 Mn / mg/1 S04 / a ag mg/1 / M	HARDNESS	CARD
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		Sta and the
		5 36 37 38 39 40 41 42
CHLORIDES COLOR UNITS GREASE & OIL OIL & GREASE RE	SIDUAL ORTHOPHOSPHATE	λ Ι
mg/1 Cl 7 / hexane / / lpet. ether / mg/	1 Cl / (filterable)	CARD
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PLASTICGLASS	THE REPAIR OF THE OF TH	= LETTER D	11.0
FACILITY ID NO. & DISCHARGE NO.		STREE CODE	A WATER CLASS
SAMPLING STATION NO.	DATE TIME OF TIME O	1014.051 1014.0514 1106.01418 54116.01418 54116.002 84116.002 84116.002 716.002 7176	WATER CLASS
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FLOW NOTES:	FLOW TEMPERATURE C FIELD	AB ,	SPECIFIC CONDUCTANCE
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MPN/100m1	S MPN 100m1 5	. /0/	CARD
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	NH3-N NITRITE-N NITRATE-N MITRATE-N MITRATE-N	• • •	AY BOD
	6 47 48 49 50 51 52 53 54 55 56 57 58 52 60 61 62 63 84 6	1 - 18	1 /0/
			73 74 75 80 2
ORGANIC	IDC CREDNOPHTEL-a mg/1	MERAL ACIDITY TOTAL mg/1 CaCO3	7 (RON )
5/-	1- 18/ 1/8/	/ /0/	6
	9 10 11 12 13 14 15 16 17 18 19 2 5 21 22 23 24 25 26 27 2	28 29 30 31 32 33 34 3	5 36 37 38 39 40 41 42
ALUMINUM (TOTAL) mg/1 A1	MANGANESE SULFATE TOTAL DISSOLUTION (TOTAL) mg/1 S04 mg/1		CARD
	51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 7		• •
	COPPER (TOTAL)		LEAD (TOTAL)
mg/1 Zn	1 5 1 5	mg/1 Cr mg/1 C	Stan valie 15
1     2     3     4     5     6     7     8	9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 2	28 29 30 31 32 33 34 3	5 36 37 38 39 4C 41 42
	COLOR UNITS GREASE & OIL OIL & GREASE RESIDUAL mg/1 mg/1 mg/1 CHLORINE // (hexane / // (pet. ether, // mg/1 CI //	mg/1 P . / /	
	March         March <th< td=""><td>10/</td><td>CARD 4</td></th<>	10/	CARD 4
DATA ITEM NAME			
- <del>D</del> 07		1.000	CARD
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SUSMITTER	MARYLAND WATER RESOURCES ADMINISTRATION WATER QUALITY DATA SHEET	NQ\$ -: J 10/73
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ACILITY ID NO.	DATE TIME OF TIME OF TIME OF SAMPLE TIME OF TIME OF	WATER CLASS WATER CLASS WATER CLASS WATER CLASS WATER CLASS WATER CLASS WATER CLASS WATER CLASS WATER CLASS
OR SAMPLING STATION NO.		
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	AIR WATER PH OF PH OF	mg/l / micromhos/cm / /
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BACTERIOLOGICAL: (HEALTH DEPT.)	OR WRA ICED YES NO SALINITY SUSPENDED	
	MPN/100m1 / / / / / / / / // // ///	S mg/1 /S CARD
1 2 3 4 5 6 7 8 9 10 11 12 13	14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 3	31 32 33 34 35 36 37 2
TURBIDITY NH3-N	NITRITE-N NITRATE-N TOTAL PO4	5 DAY BOD
FTU mg/1 N	mg/1.N mg/1.N mg/1.N	mg/1
38 39 40 41 42 43 44 48 46 47 48 40 55	0 51 52 53 54 53 56 57 58 59 60 61 62 63 64 65 66 67 6	18 69 70 71 72 73 74 75 30 2
ORGANIC TOC	CHLOROPHYLL-a TOTAL ACIDITY MINERAL ACII micrograms/1 CaCO <sub>2</sub> , CaCO <sub>2</sub> ,	mg/1 Fe mg/1 Fe+2
	13 14 15 16 17 19 19 20 21 22 23 24 25 26 27 29 29 30	31 32 33 34 35 36 37 38 39 40 41 42
ALUMINUM MANGANESE (TOTAL) (TOTAL) mg/1 A1 /> mg/1 Mn />		TOTAL HARDNESS
43 44 45 46 47 48 49 50 51 52 53 54 5	35 56 57 58 39 60 61 62 63 64 65 66 67 68 69 70 71 72	73 74 75 80 3
	/ HEXAVALENT / TOTAL	
	PER (TOTAL) CHROMIUM CHAOMIUM	(TOTAL) LEAD (TOTAL) mg/i Cd mg/3_Pb
		S G MALES
1 2 3 4 5 6 7 8 9 10 11 12 1	13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	31 32 33 34 35 36 37 38 39 40 41 42
CHLORIDES COLOR UNITS	mall CHLORINE	HO PHOSPHATE
/ / 0/ / 0/	(hoxane / / (bet. ether / / mg/1 Cl / (filterabl soluble) / 9 / 9	
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EVEL D	25 DATA ITEM VALUE	
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	DATA ITEM VALUE	
DATA ITEM NAME	DATA HEM VALUE	5 CARD
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	SEQUENCE NUMBER
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PLASTIC GLASS CALL CALL CALL CALL CALL CALL CAL	
ACILITY ID NO. & DISCHARGE NO. OR SAMPLING STATION NO. DATE TIME OF SAMPLE DATE TIME OF SAMPLE DATE TIME OF SAMPLE DATE TIME OF SAMPLE DATE	U U U U U U U U U U U U U U U U U U U
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& DISCHARGE NO. OR SAMPLING STATION NO.	WATER WA
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 2	18 29 30 31 32 33 34 37 38 39 40 41 42 Q -
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AGE HT VALUE / S/S +/ AIR WATER DH	oH / mg/l / micromhas/cm / /
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BACTERIOLOGICAL: (HEALTH DEPT.) OR WRA CICED YES NO	
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MPN/100m1 (MPN '100m1	- mg/1 / S/ CARD
	s 29 30 3. 32 33 34 35 36 37 2
	TOTAL PO4 5 DAY BOD
FTU mg/IN mg/IN mg/IN	mg/1 P mg/1
	4 6 10
<u>3 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 6</u>	5 66 67 68 69 70 71 72 73 74 75 80
ORGANIC TOC CHLOROPHYLL-a TOTAL ACIDITY MIL	NERAL ACIDITY TOTAL IRON FERROUS
mg/1 / mg/1C / micrograms/1 - CaCO2 /	mg/1 mg/1 Fe mg/1 Fe+2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 2 C 21 22 23 24 2 5 26 27	28 29 30 31 32 33 34 35 36 37 38 39 40 41 42
ALUMINUM MANGANESE SULFATE TOTAL DISSOL (TOTAL) mg/1 SO4 ALKALINITY IRON mg/1 A1 // mg/1 Mn // mg/1 SO4 // crossing/1 // mg/1	HAPDNESS / A
43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 69 67 68 69	70 71 72 73 74 75 80 3
ZINC (TOTAL) COPPER (TOTAL) CHROMIUM CH	ROMIUM (TOTAL)
	g/1 Cr mg/1 Cd mg/3 Pb
	28 29 30 31 32 33 34 35 36 37 38 39 4C 41 42
CHIORIDES / COLOR LINITS / GREASE & OIL / OIL & GREASE / RESIDUAL	/ ORTHO PHOSPHATE/ ]
CHLORIDES COLOR UNITS GREASE & OIL OIL & GREASE ASTO AND ASTO ASTO ASTO ASTO ASTO ASTO ASTO ASTO	mg/1 P
	16 CARD
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21 22 23 47	60
DATA ITEM NAME DATA ITEM VALUE	
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NUMBER (See back of sheet)	
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Additury ID PRO.         Data	84CT 00 800	արն է երկնությունների հետությունների հետությունների հետությունների հետությունների հետությունների հետությունների	(Pro AI	PUNCA IN TE-TH. ALL CARDS)
Date         Date <thdate< th="">         Date         Date         <thd< td=""><td>PLASTICGLASS</td><td></td><td>F</td><td></td></thd<></thdate<>	PLASTICGLASS		F	
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PLOW NOTES:       FLOW NOTES:	& DISCHARGE NO.	DATE	0 2 4	5 A S WATER
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FLOW		3 14 19 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1	32 33 34	
BADE HT       VALUE       Big / 4       Am       Files       Files <t< td=""><td></td><td></td><td></td><td></td></t<>				
Name         VALUE         Status         Value         Value </td <td>97</td> <td>FIELD LAB LAB</td> <td></td> <td>CONDUCTANCE / /</td>	97	FIELD LAB LAB		CONDUCTANCE / /
Image: Section of the sectio	GAGE HT.	SIG + AIR WATER PH A PH	/ / / / m	@ 25° C / C
BACTERIOLOGICAL: (HEALTH DEFT.)       ON WAA       ICCC VER NAG       SULVEY       SULV				72 73 74 75 80
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HERBERT M. SACHS DIRECTOR

## STATE OF MARYLAND DEPARTMENT OF NATURAL RESOURCES WATER RESOURCES ADMINISTRATION TAWES STATE OFFICE BUILDING ANNAPOLIS, MARYLAND 21401

CERTIFIED MAIL

## March 7, 1977

Central Chemical Corporation (Maryland Corp.) c/o Mr. Franklin M. Thomas, Jr., Resident Agent 523 Gordon Circle Hagerstown, MD 21740

C-77-432

### Gentlemen:

Pursuant to the provisions of Sections 8-1401-1417, inclusive, of the Natural Resources Article, Annotated Code of Maryland (1974 Vol. & 1975 Supp.), the Water Resources Administration has determined that a pollution violation has occurred.

Specifically, the determination is based upon the findings of Mr. Robert A. Boone, Regional Inspector, Enforcement Division, and the Groundwater Investigation group of the Hazardous Wastes Section, Water Resources Administration.

On August 3, 1976, Mr. Boone found soil contaminated with toxic metal and chemical concentrations at your facility located on Mitchell Avenue, Hagerstown, Maryland. Mr. Boone also found evidence of the same toxic chemicals concentrated in the soil of unvegetated drainage ditches located on the West and South side drainage areas from your plant building and in receiving storm drain inlet on Mitchell Avenue, waters of the State. This storm drain system flows to the unnamed tributary to Marsh Run and outfalls from concrete box culvert at Walnut Lane. Analyses on a dry weight basis of the soil samples taken from these chemical discharges revealed the following violations:

1. Location - Chemical plant drainage ditch located at west side edge of pesticide chemical loading dock -- Total Lead, 188 mg/Kgm; Total Arsenic, 53.750 mg/Kgm; DDT, 1.8672 mg/Kgm

2. Location - Chemical plant upper drainage ditch west of paper storage shed before entering Penn Central Railroad drainage ditch --Total Lead, 100.50 mg/Kgm; Total Arsenic, 16.17 mg/Kgm; DDT, 6,535.0 mg/Kgm

CEN-024329 AR100550

Central Chemical Corration (Maryland Corp.)

March 7, 1977 Page 2 (RED)

C-77-432

- 3. Location Penn Central Railroad drain inlet pipe receiving west side drainage of Chemical plant building and property -- Total Lead 124 mg/Kgm; Total Arsenic, 34.00 mg/Kgm; and DDT, 6931.98 mg/Kgm
- 4. Location Mitchell Avenue storm drain inlet below drainage from Chemical plant (northeast of railroad overpass) -- Total Lead, 138.50 mg/Kgm; Total Arsenic, 16.50 mg/Kgm; DDT, 46.68 mg/Kgm

On October 28 and 29, 1976, the Groundwater Investigation group of the Industrial and Hazardous Waste Section of this Administration conducted a series of soil borings and obtained split spoon samples from your facility and found that the following toxic chemicals sampled from your facility are causing a serious groundwater contamination problem in this area. The analyses on a dry weight basis of these samples revealed the following violations:

- Location Lowest sarea in the southeast corner of Central Chemical Corp. property. Sample #1A. Soil Depth ½' to ½', Total Lead, 395.00 mg/Kgm; Total DDT, 176.0000 mg/Kgm; Total Arsenic 20.850 mg/Kgm. Sample #1B, Soil Depth 2' to 3', Total Lead, 201.00 mg/Kgm; Total DDT, 25.1100 mg/Kgm; Total Arsenic, 11.700 mg/Kgm. Sample #1C, Soil Depth 8' to 9', Total Lead, 32.20 mg/Kgm; Total DDT, 471.0000 mg/Kgm; Total Arsenic, 8.138 mg/Kgm
- Location inside the fence line on the western side of Central Chemical Corp. property near the liquid storage area. Sample #2A,
  Soil Depth ½' to ½', Total Lead, 93.50 mg/Kgm; Total DDT, 119.4800 mg/Kgm; Total Arsenic, 16.275 mg/Kgm
- 3. Location outside Central Chemical Corp. fence line on the southeast corner of the property near the shipping area. <u>Sample #3A</u>, Soil Depth O' to 1', Total Lead, 97.25 mg/Kgm; Total DDT, 653.6000 mg/Kgm; Total Arsenic, 180.000 mg/Kgm. <u>Sample #3B</u>, Soil Depth 1' to 2', Total Lead, 197.000 mg/Kgm; Total DDT, 300.3000 mg/Kgm; Total Arsenic, 300.000 mg/Kgm
- Location outside the Central Chemical Corp. fence on the western side near the grinding and dust packing area. <u>Sample #hA</u>, Soil
   Depth 0' to 1', Total Lead, 31.00 mg/Kgm; Total DDT, 85.0500 mg/ Kgm; Total Arsenic, 38.000 mg/Kgm
- 5. Location at the northern corner at the highest point of Central Chemical Corp. property. Sample #5A, Soil Depth 0' to 1<sup>1</sup>/<sub>2</sub>', Total Lead, 114.50 mg/Kgm; Total DDT, 70.6800 mg/Kgm; Total Arsenic, 17.68 mg/Kgm. Sample #5B, Soil Depth 2<sup>1</sup>/<sub>2</sub>' to 3<sup>1</sup>/<sub>2</sub>', Total Lead, 14.75 mg/ Kgm; Total DDT, 0.2675 mg/Kgm; Total Arsenic, 5.700 mg/Kgm

6. Location - outside Central Chemical Corp. fence at the edge of abandoned Central Chemical Corp. landfill containing rubble from insecti-

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Central Chemical Corporation (Maryland Corp.)

March 7, 1977 Page 3

C-77-432

cide building destroyed in fire. Sample #6A, Soil Depth 1' to 2', Total Lead, 90.75 mg/Kgm; Total DDT, 1,646.4000 mg/Kgm; Total Arsenic, 39.25 mg/Kgm. Sample #6B, Soil Depth 3' to 4', Total Lead, 15.00 mg/Kgm; Total DDT, 34.6560 mg/Kgm; Total Arsenic, 3.715 mg/ Kgm. Sample #6C, Soil Depth 8' to 9', Total Lead, 18.65 mg/Kgm; 1.5200 mg/Kgm; Total Arsenic, 3.775 mg/Kgm

7. Location - along edge of Mitchell Avenue, south of Central Chemical Corp. plant building, where surface drainage enters public storm drains. <u>Sample #7A</u>, Soil Depth 0' to 1', Total Lead, 89.10 mg/Kgm; Total DDT, 27.3000 mg/Kgm. <u>Sample #7B</u>, Soil Depth 1' to 2', Total Lead, 79.25 mg/Kgm; Total DDT, 16.875 mg/Kgm. <u>Sample #7C</u>, Soil Depth 2' to 3<sup>1</sup>/<sub>2</sub>', Total Lead, 15.75 mg/Kgm; Total Arsenic, 2.17 mg/ Kgm

Said facility is in violation of Maryland Water Resources Regulations 08.05.04.02 A (4) and 08.05.04.05 A (2).

Accordingly, the Administration has issued the enclosed Order.

Direct any questions or correspondence regarding this matter to Mr. Robert V. Creter, Regional Chief, Enforcement Division, Water Resources Administration, Box 613-B, Highland Estates, Naves Crossroads, Cumberland, Maryland 21502; telephone number (301) 724-8530.

Sincerely,

Herbert M. Sachs, Director

By : Joseph P. Lewandowski, Chief

CEN-024331 AR100552

Enforcement Division

### HMS:JPL:km

cc: Warren K. Rich, Esq., Asst. Attorney General Mr. Robert V. Creter Mr. William E. Chicca, WRA

Washington County Health Dept. Mr. David Woronecki, Fisheries Admin.

Central Chemical Corporation (Maryland Corp.)	:		WATER	(RED. WAL
c/o Mr. Franklin. M. Thomas, Jr. 523 Gordon Circle	:	:	RESOURCES	REDUNAL
Hagerstown, MD 21740	:		ADMINISTRATION	

VIOLATOR

ware water

# ORDER

C-0-77-432

Pursuant to the provisions of Sections 8-1401-1417, inclusive, of the Natural Resources Article, <u>Annotated Code of Maryland</u> (1974 Vol. & 1975 Supp.), it is, this 7th day of February, 1977, by the Water Resources Administration, ORDERED:

That Central Chemical Corporation (Maryland Corp.) shall:

- By April 30, 1977, submit to the Cumberland Regional Office of this Administration results from hydrologic investigation by a competant engineering firm to include but not limited to extensive soil sampling to determine levels of Total Lead, Total Arsenic and DDT.
- 2. By May 30, 1977, submit to the Cumberland Regional Office for review and approval, a detailed plan and time schedule for eliminating all

contaminated soil and for restoration of all disturbed ground areas.

3. By May 30, 1977, submit for review and approval a plan for preventing

reoccurrence of untreated chemical discharges and/or soil contamina-

Herbert M. Sachs, Director Water Resources Administration Tawes State Office Building Annapolis, Maryland 21h01

Enforcement Division

Lewandowski

AR10055

CEN-024332

Joseph P.

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	DEPARTMENT OF HEALTH AND MENTAL HYC Laboratories Administration 201 W. Preston Street	SIENE "CO"
	J. Mensen Joseph, Ph.D., Director TRACE ORGANICS LABORATORY	
	VOLATILE ORGANICS ANALYSIS	
NUMBER 65 032787-01		Washington Name of County
	reide durp/brasil COLLECTOR	Souberg
	TRIBUTION SOURCE	OTHER
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Suspected Industrial Chemical	•	
Other (specify)		
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TRANS COUNTY TYPE	PLANT NO. SAMPLING STATION	
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momethane		
Dichlorodifluoromethane	Dibromochloromethane	Ethylbenzene
Vinyl chloride		Total Xylenes
Chloroethane	cis-1,3-Dichloropropene	Total Purgeable Hydrocarbons
Methylene chloride	2-Chloroethylvinylether	Tetrahydrofuran
Trichlorofluoromethane	Bromoform	(2-Butanone) (MEK) 29-PPM-
1,1-Dichloroethene	1,1,2,2-Tétrachloroethane	Methylisobutylketone (MIBK)
1,1-Dichloroethane	Tetrachloroethene	
trans-1,2-Dichloroethene	Chlorobenzene	
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Bromodichloromethane		CEN-024333
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DATE RECEIVED MAR 31 1987		

MARYLAND STATE DEPARTMENT OF HEALTH AND MENTAL HYGIENE Frogram: Laboratories Administration Howard and Biddle RCRA 54 -P.O. Lab. N. 570208 NPDES urganic Analysis Report Form SPECIFY Priority ASAP coilector Sonberg 1900-2000 3/27/87 Sample Source Central Chemical Sample ID No. 65032787-01 Preservative Used none Sample Alert <u>Sandes from historic pesticide</u> landfill have shown DDI - Dioxing historic samples Chain of Fustory sample possession 112045 3/31/87 to Alra Lew 1120 3/31/87 date Name/time/date From Liller From Name/time/date Name/time/date From Name/time/date Name/time/date EP Toxicity Organics time detected DL = 2 cpb endrin lindane Cone detected DC= 4 ppb methoxychlor one detected DL = 90 ppb toxaphene 🚬 diticted IL = Eppb -2, 4-D 2, 4, 5-TP(silver) LIL= Sppb Organics Analysis \*Purgeable halocarbons El and indivited the \*Purgeable aromatics \*Acrolein & Acrylonitrile \*Phenols \*Phthalate esters \*Organochlorine Pesticides **4**1 万万ぷ 4141 \*Nitrogromatics & Isophorone 41 \*Polynuclear aromatic hydrocarbons \*Haloethers \*Chlorinated hydrocarbons \*see other side for specific compounds GC/MS ONALISIS undicited the following o - Cran 4 - dichloroberzene Organic identification and comparison 7 oil and grease PPM Authorized By: Section Chief: ied 🚌 Date: R100F CEN-024334 1963

DEPARTMENT OF HEALTH AND MENTAL HYGIENE       Linderstate of the state o	
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VOLATILE ORGANICS ANALYSIS         BOTTLE         BOTTLE         Contral         Chick organization         SURCE OF SAMPLE         Central         Chick organization         Contral         Observation Well         Observation Samples         Supported Industrial Enfluent         Obser	
NUMBER       J.S.D.Q.GQSDU/L92B       COLLECTOR       Datage       Distance	
(Include Address)	
(Include Address)	
SAMPLE TYPE:       Community       0       Observation       STP Station         Observation Well       Stream       Tidal Waters       Industrial Effluent         Other (Specify)       Option       BH-Z       Industrial Effluent         Preservative Used       First time sampled       X         IMPORTANT:       First time sampled       X       Suspected Petroleum Contamination         Suspected Industrial Chemical Contamination       X       Other (Specify)         CHAIN OF CUSTODY:       From:       D       D         From:       D       D       D       D         TRANS       Country       PLNT NO.       Samplus       Date Collected       Coand         TRANS       Country       PLNT NO.       Samplus       Date Collected       Coand       No.         TRANS       Country       PLNT NO.       Samplus       Date Collected       Coand       No.         Trans       Country       PLNT NO.       Samplus       Date Collected       Coand       No.         Trans       Country       PLNT NO.       Samplus       Date Collected       Coand       No.         Trans       Country       PLNT NO.       Samplus       Date Collected       Coand       <	
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Other (Specify)     BH Z       Preservative Used	
Preservative Used	
IMPORTANT:       First time sampled	
Reason for submitting sample: Survey	
Suspected Industrial Chemical Contamination       X       Other (Specify)         CHAIN OF CUSTODY:       From:       D-B Obort 19/28/38       To:         From:       To:       To:       To:         REMARKS:       To:       To:       To:         Image: Country       Image: Country       PLANT NO.       Sameling       Image: Country       Image: Country       PLANT NO.       Sameling         PIELD       PIELD       RESID. CHLORINE: FREE       TOTAL       Other Purgeables         Purgeable Halocarbons (EPA       COL       Stampling       Total       Other Purgeables         Purgeable Halocarbons (EPA       Col / 1       Chioromethane       Chioromethane       Tichloroethane       Total       Benzene       4/2         Dibromochloromethane       Chioroethane       Chioroethane       Total Xylenes       5/1         Vinyl choride       1/1.2-Trichloroethane       Total Xylenes       5/1         Methylene chloride       1/2-Chloroethylvinylether       Total Purgeable Hydrocarbons       4/2	
CHAIN OF CUSTODY: From: D. HODENT 10 125/38       To:         Colspan="2">Other Purgeables         Other Purgeables         To:         To:         To:         To:         To:         To: <th colsp<="" td=""></th>	
From:       To:         To:         To:         To:         To:         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16       17       18       19         TRANS       COUNTY       PLAT NO.       SAMPLING       DATE COLLECTED       CARD         TRANS       COUNTY       PLAT NO.       SAMPLING       DATE COLLECTED       CARD         TRANS       COUNTY       PLAT NO.       SAMPLING       DATE COLLECTED       CARD         TOTAL       Date collected       COLLECTED       NO.         Purgeable Halocarbons (EPA       GOIN         Othoromethane       Colspan= 2       Colspan= 2       Colspan= 2       Total       Distoromethane       Sampling       Total Xylenes         Dichlorodifluoromethane       Colspan= 2 <th c<="" td=""></th>	
REMARKS:         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16       17       18       19         TPANS       COUNTY       PLANT NO.       SAMPLING       DATE COLLECTED       CARD       CARD       NO.         TYPE       COUNTY       PLANT NO.       SAMPLING       DATE COLLECTED       CARD       NO.         20       21       22       22       22       25       25         FIELD       FIELD RESID. CHLORINE: FREE       TOTAL       Image: Collected billing       NO.         Purgeable       Halocarbons (EPA       (D)       Chlorodinorpropene       Image: Collected billing       Image: Collected billing       15         Chloromethane       Simplifier       Tothoroetheme       Image: Collected billing       Image: Co	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
TPANS       COUNTY       PLANT NO.       SAMPLING       DATE COLLECTED       CARD         TYPE       20       21       22       23       24       25       25       26         Purgeable       Halocarbons (EPA       (COL)       20       21       22       25       25       26       25       26       26       27       27       26       27       27       25       26       26       26       27       27       27       27       26       27       27       27       26       27	
TPANS       COUNTY       PLANT NO.       SAMPLING       DATE COLLECTED       CARD         TYPE       COUNTY       PLANT NO.       SAMPLING       DATE COLLECTED       CARD         20       21       22       22       22       25       26         PIELD       FIELD RESID. CHLORINE: FREE       TOTAL       Image: Country No.       25       26         Purgeable Halocarbons (EPA       (COL)       Cother Purgeables       10       Cother Purgeables         Chloromethane       Stans-1,3-Dichloropropene       Senzene       14.5         Bromomethane       Stans-1,3-Dichloropropene       Senzene       14.2         Dichlorodifluoromethane       Dibromochloromethane       Stans-1,12-Trichloroethane       10         Dichlorodifluoromethane       Intervention       Stans-1,12-Trichloroethane       10         Vinyl choride       Int.1,2-Trichloroethane       Intervention       10         Chloroethane       Int.1,2-Trichloroethane       Intervention       10         Methylene chloride       Int.2-Trichloroethane       Int.2       Int.2         Methylene chloride       Int.2-Chloroethylyinylether       StansInt.2	
TRANS TYPE     COUNTY     PLANT NO.     SAMPLING STATION     DATE COLLECTED     CARD NO.       20     21     22     23     23     24     25     28     25     26       PIELD     FIELD RESID. CHLORINE: FREE     TOTAL     TOTAL     Other Purgeables       Purgeable Halocarbons (EPA     60     2     Total     Benzene     45       Chloroethane     Stathoroethane     Stathoroethane     Stathoroethane     Stathoroethane     Stathoroethane     Stathoroethane       Vinyl choride     1,1,2-Trichloroethane     Vinyl choride     1,1,2-Trichloroethane     Vinyl choride     Total Xylenes     5/1       Chloroethane     2.Chloroethylvinylether     Vinyl     Tetrahydrofuran     M.D.	
TYPE     STATION       20     21     22       PIELD     PIELD RESID. CHLORINE: FREE     TOTAL       Purgeable Halocarbons (EPA     (2)       Chloromethane     55       Bromomethane     55       Dichlorodifluoromethane     55       Dichlorodifluoromethane     55       Indicate the state of the	
FIELD       FIELD RESID. CHLORINE: FREE       TOTAL         Purgeable Halocarbons (EPA       (D)       Other Purgeables         Chloromethane       5       trans-1,3-Dichloropropene       8enzene       45         Bromomethane       5       trans-1,3-Dichloropropene       8enzene       45         Dichlorodifluoromethane       1,1,2-Trichloroethane       51       Total Xylenes       51         Vinyl choride       1,1,2-Trichloroethane       V       Total Purgeable Hydrocarbons       11/2.         Chloroethane       2-Chloroethytvinylether       Y/D       Tetrahydrofuran       11/2.	
PH       Pield Hesib. CHLORINE: PREE       I       IOTAL       I         Purgeable Halocarbons (EPA       (0)       Chloromethane       (0)       Chloromethane       (1)         Chloromethane       (5)       trans-1,3-Dichloropropene       (1)       Benzene       (1)         Bromomethane       (1)       Trichloroethene       (2)       Toluene       (2)         Dichlorodifluoromethane       (1)       Dibromochloromethane       (2)       Ethylbenzene       (4)         Vinyl choride       (1)       (1)       (2)       Total Xylenes       (5)         Chloroethane       (1)       (2)       Total Yylenes       (5)         Methylene chloride       (2)       Chloroethytvinylether       (1)       Tetrahydrofuran	
Chloromethane       <5	
Chloromethane       <5	
Bromomethane       Image: Trichloroethene       Image: Trichloroethenene       Image: Trichloroethene       Image: Tr	
Dichlorodifluoromethane     Oibromochloromethane     <1     Ethylbenzene     42       Vinyl choride     1,1,2-Trichloroethane     Total Xylenes     .5/       Chloroethane     V     Total Yylenes     .5/       Methylene chloride     .2-Chloroethylvinylether     I/Q     Tetrahydrofuran	
Vinyl choride     1,1,2-Trichloroethane     Total Xylenes     .5/       Chloroethane     1     .5/     .5/       Methylene chloride     2-Chloroethylvinylether     10     Tetrahydrofuran	
Chloroethane	
Methylene chloride2-Chloroethylvinylether <u>\$10</u> Tetrahydrofuran <u>11.2</u>	
Trichlorofluoromethane Bromoform SI (2-Butanone MEK)	
-Dichloroethene	
1,1-Dichloroethane	
trans-1,2-DichloroetheneChlorobenzene	
Chloroform Carbon Disulfide	
1,2-Dichloroethane <u>Cince</u> Other Purgeable Organics: Vinyl Acetate	
1,1,1-Trichloroethane	
Carbon Tetrachloride	
Bromodichloromethane	
1,2-Dichloropropane	
1,2-DichlorobenZene (estimated) = 180	
14-Dicklembenzene (estimated) = 780	
CEN-024335	
891875	
AR 100500	
DATE REPORTED 14 1 CHEMIST / CLEMAC AR NO	

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VOLATILI	E ORGANICS ANALYSIS		
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		207WTV Why I	hireton
SOURCE OF SAMPLE	bemical		ر ۲
iciude Address)M1+chell X	we	-	·
SAMPLE TYPE: Community <u>Noncommunity</u>		STP Station	······································
Observation Well Stream	Tidal Waters	Industrial Effluent	
Other (Specify) Borkingf	54-5	· · · · · · · · · · · · · · · · · · ·	
Preservative Used		· ·	· · ·
PORTANT: First time sampledX	t known sampling date	· · · · · · · · · · · · · · · · · · ·	
Reason for submitting sample: Survey	Suspected Petr	roleum Contamination	
Suspected Industrial Chemical Contamination	X Other (Speci		, ,, ,.
HAIN OF CUSTODY: From: B. B. OUTN 0/25	8/88To:		<u> </u>
From:	To:		<u> </u>
REMARKS:		1 3 Marana	<u> </u>
			· ··
1 2 3 4 5 5 7 8	9 10 11 12 13	14 t5 t6 t7 t2 t6	
		7 5 6 9 15 15	· .
TRANS COUNTY PLANT NO.	SWPLING DATE		2000 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 -
20 21 22	STARON	COLLECTED CARD	
	23 Z4	125 25 i	7,
Purceable Halocarbons (EPA 60)	<u></u>	Cther Purgeables	
hieromethane < <u>5D</u> trans-1,3-Dict		Benzene	<u> </u>
romomethane		Toluene	42
DichlorodifluoromethansDibromochloro	······································		
invi choride1,1.2-Trichioro		. Total Xylenes	55
hioroethane ct: +1,3-Dichlo			<u>~ //</u>
Metnylene chloride 2-Uniorbethyły		Tetrahydrofuran	N.D
noniorofluoromethaneBromoform	<10_	(2-Butanone MEK)	
1-Dichloroethene 1,1,2,2-Tetrac		Methylisobutyiketone (MIBK)	<u> </u>
1,1- Tetrachloroeth		Acrolein	<u> </u>
ans-1,2-Dichloroethene Chlorobenzene		Acrylonitrile	
ChloroformTotal_Trihalom		Carbon Disulfide	_ <u>_</u>
1,2-Dichloroethane Other	Purgeable Organics:	Unyl Acetate	<u> </u>
Carbon Tetrachlonde	<u> </u>	Acetone	1
Bremodichloromethane	- <u> </u>	2-Hexanone	<u>,                                     </u>
2-Dichloropropane		4Styrene	<u>V</u>
			· · ·
1,7-Dichlombenzene (estimated) =	34-0	, 	
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site in the second s			
		- <u>***</u>	، نَصْلَةَ أَحَدَيْنَ مَنْ الْمُنْتَحَدَّةِ مَنْ الْمُنْتَحَدَّةِ مَنْ الْمُنْتَحَدَّةُ مَنْ الْمُنْتَحَدَّةُ م المح
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Results reported in mic	Torans per loans per million/	Sillion	891880
	REA A 11000	The AMALLE	AR100557
	ABC No + HERE CHEMIC		i0 -
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CENTRAL CHEMICAL SOIL BORING RESULTS OCT 1988

SAMPLE DEPTH (ft) HEAD SPACE (ppm)	BH-1-4 6-8 6.2-20	8K-2-7 12-14 150->1000	8/1-3-5 8-10 12-35	BH-4-3 E 4-6 0	9H-5-7 14-16 6-400	BH-6-4 10-12 78-95	BH-6-5 12-14 40-85	BH-2(water) 36 HA	BH-5(water) 32.5 NA
VOLATILES (ppm)	н							1	
chloromethane bromomethane acrolein acrilonitrit dichloroethane acrolein acrilonitrit dichloroethane itrichlorofluoromethane trichlorofluoromethane 1.1-dichloroethane 1.1-dichloroethane 1.1-dichloroethane trans-1,2-dichloroethane 2-butonone (MEK) 1.1.1-trichloroethane 2-butonone (MEK) 1.1.2.2-tetrachloroethane 1.2.2-dichloropropane trichloroethane 1.2.2-tichloroethane 1.2.2-tichloroethane 1.2.2-tichloroethane 1.2.2-tichloroethane 1.2.2-tichloroethane 1.2.2-tichloroethane 1.1.2-trichloroethane 2-buzene trans-1.3-dichloropropane tetrachloroethane 1.1.2-thoroethane (HIBK) toluene chlorobenzene m-xylene o&p-xylene	ND ND ND ND ND ND ND ND ND ND ND ND ND N	ND NO	ND ND ND ND ND ND ND ND ND ND ND ND ND N	ND		ND ND ND ND ND ND ND ND ND ND ND ND ND N			ND ND ND ND ND ND ND ND ND ND ND ND ND N
1,3-dìchlorobenzene 1,2-dìchlorobenzene 1,4-dichlorobenzene	0.066 1.1 1.2		0.017 0.079 0.34	0.006 0.034 0.046	ND 0.015 0.045	0.014 0.058 0.26	0.79 3.3 22	0.027 0.27 0.63	0.021 0.9 0.34
ethylbenzene	*0.008	ND	0.053	ND	ND	ND	ND	0.046	0.097

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\* indicates a result below exact quantification

CENTRAL CHEMICAL SOIL BORING RESULTS OCT 1988

SAMPLE DEPTH (ft)	BH-1-4 6-8	BH-2-7 12-14	BH-3-5 8-10	BH-4-3 BH-5-7 4-6 14-16	BH-6-4 10-12	BH-6-5 12-14
SEMI-VOLATILES (ppm)		!		1		
SEMI-VOLATILES (ppm) phenol bis(2-chloroethyl)ether 2-chlorophenol 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene bis(2-chloroisopropyl)ether 4-methylphenol N-nitroso-Di-n-propylamine hexachloroethane nitrobenzene isophorone 2-nitrophenol 2,4-dimethylphenol bis(2-chloroethoxy)methane 2,4-dichlorophenol acenaphthene 1,2,4-trichlorobenzene naphthalene hexachlorobutadiene 4-chloro-3-methylphenol	ND           ND	12-14				12-14 ND ND ND ND ND ND ND ND ND ND ND ND ND
di-n-butylphthalate indeno(1,2,3-cd)pyrene dibenzo(a,h)anthracene	*11 NO ND	*2.6 ND ND	*0.22 ND ND	ND ND ND *0.067 ND ND	*0.88 NO ND	*1_4 NO ND
benzo(g,h,i)perylene n-nitrosodimethylemine benzidene	ND ND	ND ND ND	ND ND ND	ND ND NO NO ND ND	nd No Nd	ND No Nd

\* indicates a result below exact quantification

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CENTRAL CHEMICAL SOIL BORING RESULTS OCT 1988

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gemme-BHC         Lindene)         ND	
Alpha-BHC       110       ND       ND       ND       ND       ND       ND         Beta-BHC       ND       ND       ND       ND       ND       ND       ND         gamma-BWC (Lindane)       ND       ND       ND       ND       ND       ND       ND         Heptachlor       ND       ND       ND       ND       ND       ND       ND         Aldrin       ND       ND       ND       ND       ND       ND       ND         Heptachlor       ND       ND       ND       ND       ND       ND       ND         Aldrin       ND       ND       ND       ND       ND       ND       ND         Heptachlor       ND       ND       ND       ND       ND       ND       ND         Aldrin       ND       ND       ND       ND       ND       ND       ND         Fidosulfan       I       ND       ND       ND       ND       ND       ND       ND         Fidosulfan       II       ND       ND       ND       ND       ND       ND       ND         Fidosulfan       Sigoon       100       ND       ND       N	
Delta-BHC         260         ND         ND         ND         ND         ND         ND           gmma-BHC         INdext         ND         ND <td></td>	
Heptechlor         ND	
Heptachlor epoxide         ND         ND <td>• •</td>	• •
Djeldrin     ND     ND     ND     ND     ND     ND     ND       4,4'-DDE     ND     ND     390     130     840     *57     *140     *1200       Endrin     ND     ND     ND     ND     ND     ND     ND     ND       Endosulfan II     ND     ND     ND     ND     ND     ND     ND       Endosulfan sulfate     ND     ND     ND     ND     ND     ND     ND       Endosulfan sulfate     ND     ND     ND     ND     ND     ND     ND       Endosulfan sulfate     ND     ND     ND     ND     ND     ND     ND       Endosulfan sulfate     ND     ND     ND     ND     ND     ND     ND       Endosulfan sulfate     ND     ND     ND     ND     ND     ND     ND       Endosulfan sulfate     ND     ND     ND     ND     ND     ND     ND       gamma-Chlordane     ND     ND     ND     ND     ND     ND       gamma-Chlordane     ND     ND     ND     ND     ND     ND       Arochlor-1016     ND     ND     ND     ND     ND     ND       Arochlor-1232 <td></td>	
EndrinNDNDNDNDNDNDNDNDEndosulfan IINDNDNDNDNDNDNDND4,47-DDD*1402100*1222000*32*120*370Endosulfan sulfateNDNDNDNDNDNDND4,47-DDT670031000130760003901900*5400MethoxychlorNDNDNDNDNDNDNDEndrin sldehydeNDNDNDNDNDNDgamma-ChlordaneNDNDNDNDNDNDgamma-ChlordaneNDNDNDNDNDNDArochlor-1016NDNDNDNDNDNDArochlor-1221NDNDNDNDNDNDArochlor-1248NDNDNDNDNDNDArochlor-1254NDNDNDNDNDND	
Endosulfan II ND ND ND ND ND ND 4,4'-DDD *12 22000 *32 *120 *370 Endosulfan sulfate ND ND ND ND ND ND ND 4,4'-DDT 6700 31000 130 76000 390 1900 *5400 Methoxychlor ND ND ND ND ND ND ND Endrin aldehyde ND ND ND ND ND ND ND Endrin aldehyde ND ND ND ND ND ND ND gamma-Chlordane ND ND ND ND ND ND ND foxsphere ND ND ND ND ND ND ND Arochlor-1016 ND ND ND ND ND ND ND Arochlor-1221 ND ND ND ND ND ND ND Arochlor-1242 ND ND ND ND ND ND ND Arochlor-1248 ND ND ND ND ND ND ND ND Arochlor-1248 ND ND ND ND ND ND ND ND Arochlor-1254 ND ND ND ND ND ND ND	
Endosulfan sulfateNDNDNDNDNDNDND4,4'-DDT670031000130760003901900*5400MethoxychlorNDNDNDNDNDNDNDEndrinaldehydeNDNDNDNDNDNDalpha-ChlordaneNDNDNDNDNDNDgamma-ChlordaneNDNDNDNDNDNDgamma-ChlordaneNDNDNDNDNDNDfoxapheneNDNDNDNDNDNDArochlor-1016NDNDNDNDNDNDArochlor-1232NDNDNDNDNDNDArochlor-1248NDNDNDNDNDNDArochlor-1254NDNDNDNDNDND	
MethoxychlorNDNDNDNDNDNDNDNDEndrin sldehydeNDNDNDNDNDNDNDNDalpha-ChlordaneNDNDNDNDNDNDNDgamma-ChlordaneNDNDNDNDNDNDNDgamma-ChlordaneNDNDNDNDNDNDNDArochlor-1016NDNDNDNDNDNDArochlor-1232NDNDNDNDNDNDArochlor-1242NDNDNDNDNDNDArochlor-1254NDNDNDNDNDND	
alpha-Chlordane     ND     ND     ND     ND     ND     ND     ND       gamma-Chlordane     ND     ND     ND     ND     ND     ND       Toxaphene     ND     ND     ND     ND     ND     ND       Arochlor-1016     ND     ND     ND     ND     ND     ND       Arochlor-1221     ND     ND     ND     ND     ND     ND       Arochlor-1232     ND     ND     ND     ND     ND     ND       Arochlor-1242     ND     ND     ND     ND     ND     ND       Arochlor-1248     ND     ND     ND     ND     ND     ND       Arochlor-1254     ND     ND     ND     ND     ND     ND	
Gamma Circlo Gaile     ND     ND     ND     ND     ND     ND       Arochlor-1016     ND     ND     ND     ND     ND     ND     ND       Arochlor-1221     ND     ND     ND     ND     ND     ND     ND       Arochlor-1232     ND     ND     ND     ND     ND     ND       Arochlor-1242     ND     ND     ND     ND     ND       Arochlor-1248     ND     ND     ND     ND     ND       Arochlor-1254     ND     ND     ND     ND     ND	
Arochlor-1016 ND ND ND ND ND ND ND Arochlor-1221 ND ND ND ND ND ND ND Arochlor-1232 ND ND ND ND ND ND ND Arochlor-1242 ND ND ND ND ND ND ND Arochlor-1254 ND ND ND ND ND ND ND ND Arochlor-1254 ND ND ND ND ND ND ND	
Arochlor-1232 NU NU NU NU NU NU NU NU Arochlor-1242 ND NO NO NO NO NO NO Arochlor-1254 ND ND ND ND ND ND ND Arochlor-1254 ND ND ND ND ND ND ND ND	
Arochlor-1248 ND	
HERBICIDES (EP TOX) (ppb)	
2,4-D ND	
2,4,5°T ND ND ND ND ND ND ND	
PESTICIDES (EP TOX) (ppm)	
gamma~BHC - ND	
Methoxyclor ND ND ND ND ND ND ND	
Toxapherie ND ND ND ND ND ND	
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CENTAAL CHEMICAL SOIL BORFING RESULTS

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BH-6-5 12-14

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BII-2-7 12-14	171.0 46.6 76.6 77.0 77.0 77.0 77.0 77.0 732.0 7 72.0 7 72.0 7 72.0 7 72.0 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	99999999999999999999999999999999999999
BH-1-4	22 22 22 22 22 22 22 22 22 22 22 22 22	999999999 
(ft)	(my) (ppm)	
H-	silver silver antimony beryllium chromium compor mercury mercury nickel thallium selenium selenium thallium zinc INORGANICS (EP 10	silver arsenic barium croomium croomium mercury lead selenium

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10:58

BH-6-4 10-12	58.5 58.5 58.5 58.5 58.5 58.5 58.5 59.5 59	<u>599999999</u>
84-5-7 14-16	5.12 10.6 10.6 10.6 10.6 10.6 10.6 10.6 10.6	856565555
9-7 8-7-18	2.00 3.31.1 3.31.1 5.5 45 5.5 45 7 4.1 5.5 45 6.5 5.0 6.5 .0 6.5 .0 6.5 .0 6.5 .0 6.5 .0 6.5 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0	222222222
BII-3-5 8-10	222 222 222 222 222 222 222 222 222 22	
BII-2+7 12-14	771.0 771.0 797.0 797.0 797.0 797.0 797.0 792.0	

137.0 137.0 137.0 137.0 137.0 137.0 137.0 137.0 21.8 21.8 21.8 21.8 21.8 21.8 21.8 21.8	8888888888
5 12 5.0 5 1	22227222 <u>9</u>
5, 49, 49, 69, 69, 89, 89, 89, 89, 89, 89, 89, 89, 89, 8	85655555
82.0 331.1 331.1 331.1 339.0 55.0 655.0	<u> 오</u> 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오

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STATE OF MARYLAND DEPARTMENT OF HEALTH AND MENTAL HYGIENE Laboratories Administrat 79( 2120 Program: LAB. NO. Dir tor RCRA ZARDOUS WA TE. ABORATORY TI SAMPLE SUBMISSION FORM NPDES. SPECIFY Priority. Tave THISS Collector Sample Source ee plla 5 . ( i.e. Sample ID No. Lised -0 i. ዮምን 1CL Sample Alert Chain of Custody sample possession BOONE/083 Colas 89 1.C Name/time/date want 4% Name/time/date Name/time/date From Name/time/date Name/time/date ORGANIC □ METAL INORGANIC Y -7-89-RAB-1 2 - RAB-2 4-27-89-RAB-3 27=89-RAB-4 -27-89-RAB-S AUG 7 1989 HSWMA SINFORCEMENT PROGRAM CEN-024341 19 تىن م ک the set of the set of the set **\***, \*\*\*\*

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	HA	ZARDOUS WASTE LABORA		
Priority		Organic Analysis Report Form		
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Collector <u></u>	Name/Time/Date	Soil Sample Source	M. LehellAve.	Stam draffin
Sample ID No. 4-2	7-29- FAB-1	Preservative Use		offin 11
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Chain of Custody Sample			· · · · · · · · · · · · · · · · · · ·	
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	Name/Time/Date	· · · · · · · · · · · · · · · · · · ·	Name/Time/I	Date
From:	Name/Time/Date	то:	Name/Time/E	
<u></u>				
Circle Parameters Reques	P Toxicity;	y Pollutant Scan; PCB/Pestic	ides:) Identify/Co	mpare
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E	P Toxicity;	GC Analysis indit the following PC	cates the presence of B/Pesticides:	PPM
GC/MS analysis indicates	P Toxicity;	GC Analysis ind	cates the presence of B/Pesticides:	PPM 43
GC/MS analysis indicates	P Toxicity;	GC Analysis indit the following PC	cates the presence of B/Pesticides:	PPM
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GC/MS analysis indicates	P Toxicity;	GC Analysis indi the following PC DDT DDT DDT	cates the presence of B/Pesticides:	PPM 43 present but not separa b
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GC/MS analysis indicates	P Toxicity; Priority	GC Analysis indi the following PC DDT DDT DDT DDT CbT Q-T Q-T A-T Evd	cates the presence of B/Pesticides: 	PPM 43 present but not separab 16 7.3 0.16 0.33 0.05 0.04 0.27
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GC/MS analysis indicates the following: REC	P Toxicity; Priorit; s the presence of TEIVED 7 1985	GC Analysis indi the following PC DDT DDT DDT DDT ChI C-T S-T S-T S-T S-T S-T	cates the presence of B/Pesticides:	PPM 43 present but not separab 16 7.3 0.16 0.33 0.05 0.04 0.27
GC/MS analysis indicates the following: REC AUG	P Toxicity; Priorit; s the presence of <b>TEIVED</b> 7 1985 SWMA ENT PROGRAM	GC Analysis indi the following PC DDT DDT DDT DDT ChI Q-T Q-T A-T Evd	cates the presence of B/Pesticides: 	PPM 43 present but not separab 16 7.3 0.16 0.33 0.05 0.04 0.27
GC/MS analysis indicates the following: REC AUG	P Toxicity; Priorit; s the presence of TEIVED 7 1985 SWMA ENT PROGRAM	GC Analysis indi the following PC DDT DDT DDT DDT ChI C-T S-T S-T S-T S-T S-T	cates the presence of B/Pesticides:	<u>PPM</u> <u>43</u> present but <u>not separa b</u> <u>16</u> <u>7.3</u> <u>0.16</u> <u>0.33</u> <u>0.05</u> <u>0.04</u> <u>0.27</u>
GC/MS analysis indicates the following: REC AUG ENFORCEM	P Toxicity; Priorit; s the presence of TEIVED 7 1985 SWMA ENT PROGRAM	GC Analysis indi the following PC DDT DDT DDT DDT ChI C-T S-T S-T S-T S-T S-T	cates the presence of B/Pesticides: ) ordane SHC SHC SHC Lindane) SHC cin	PPM 43 Present but not separa b 16 7.3 0.16 0.33 0.05 0.04 0.27
GC/MS analysis indicates the following: REC AUG ENFORCEM	P Toxicity; Priorit; s the presence of <b>EIVED</b> 7 1985 SWMA ENT PROGRAM ENT PROGRAM	GC Analysis indi the following PC DDT DDT DDT CbI Q-T Q-T Q-T End D-T DT DT DT DT DT DT DT D	cates the presence of B/Pesticides: ) ordane SHC SHC SHC Lindane) SHC cin	PPM 43 Present but not separa b 16 7.3 0.16 0.33 0.05 0.04 0.27

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Priority		Organic Analysis Report For	<b>m</b>	ī ·
Collector <u>F. Sc</u>	$\frac{1}{\sqrt{16}} / \frac{50}{16} / \frac{1}{\sqrt{16}}$	Sample Source	Contra V Contra and a	Ser and States
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GC/MS analysis ind the following:	licates the presence of	GC Analysis in the following P	ficates the presence of CB/Pesticides:	Mea
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the following:			CB/Pesticides:	0.86 8.1 8.8 0.22
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the following:			CB/Pesticides:	0.86 8.1 8.8 0.22
the following:			CB/Pesticides: T D E D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C C C C C C C C C C C C C	0.86 8.1 8.8 0.22 0.52 0.10 0.10
the following:			CB/Pesticides: T D E D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C C C C C C C C C C C C C	0.86 8.1 8.8 0.22 0.52
the following:		•	CB/Pesticides: T D E D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C C C C C C C C C C C C C	0.86 8.1 8.8 0.22 0.52 0.10 0.10
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the following:	ECEVED AUG 7 HSWMA	•	CB/Pesticides: T D E D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C C C C C C C C C C C C C	0.86 8.1 8.8 0.22 0.52 0.10 0.10
the following:	ECEVED Aug z	•	CB/Pesticides: T D E D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C D C C C C C C C C C C C C C	0.86 8.1 8.8 0.22 0.52 0.10 0.11 0.28
the following:	ECEVED AUG 7 HSWMA	•	CB/Pesticides: T D E ordane SHC SHC SHC (Lindane) SHC Irin	0.86 8.1 8.8 0.22 0.52 0.10 0.11 0.28
the following: Ri Ri	ECEVED AUG 7 HSWMA	•	CB/Pesticides: T D E ordane SHC SHC SHC (Lindane) SHC Irin	0.86 8.1 8.8 0.22 0.52 0.10 0.10 0.11 0.28
the following: Ri Ri	DCEVED AUG 7 HSWMA EMENT PROGRAM	the following P DD DDI DDI Chilo X-T B-T X-T A-T	CB/Pesticides: T D = ordane 3HC 3HC (Lindane) 3HC (rin	0.86 8.1 8.8 0.22 0.52 0.10 0.10 0.11 0.28
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	Preservative Used	in the
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Specify Program:		1
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rom:Name/Time/Date	To:Name/Time/Dat	c
and the second	an a	<u> </u>
Circle Parameters Requested:		· · · ·
(EP Toxicity;) Priority Pollutant Scan;		Dare
	PCB/Pesticides: Identify/Com	
the following:	the following PCB/Pesticides:	PPM
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		not sepa
	DDE	43
	Chlardane	
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		2.5
	X-RHC (Lindone)	
		6.46
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RECEIVED	A-BHC Enduin	0.46
RECEIVED	A-BHC Endrin	0.46 0.57 0.27
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FNCOD HSWMA	A-BHC Endrin	0.46 0.57 0.27
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DECARTMENT OF HEALTH A DECARTMENT OF HEALTH A 201 W Prest P.O. Box 2355, Baltimore J. Mehsen Joseph, Pl	ND MENTAL HYGIENE instration on St.	LAB. NO.	Tanko (	۲
HAZARDOUS WASTE		LAB. NO.	<u>, _</u>	
Priority Organic Analysis I			· · · · _	
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Collector <u>2.300 Not</u> <u>152D/ (127.89</u> se Name/Time/Date	mple Source	Chemich Pre-	1 jail sim	<u>~~{</u> /.
Sample ID No. $\frac{42789}{789}$ PI		LO CATIN	Le S-mapers	5
Sample Alert The risk State Trap by Lindow		<u> </u>		
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Specify Program:				
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Circle Parameters Requested:			et mente to the second	
EP Toxicity; ) Priority Pollutant Scan;	PCB/Pesticides:	Identify/Compare		
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		esence of		<u> </u>
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GC/MS analysis indicates the presence of Generation of the following:	C Analysis indicates the pr	resence of s:	<u>PPM</u> 159 	nt ;
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Priority		STE LABORATORY sis Report Form		
Collector 1 2 1530 Name/Ti	<u> / / 27-X7</u> me/Date	A	Chimin UConstis	
Sample ID No. 4 27-89 - 24		Preservative Used 7 ~ J		- 1 (l.)
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om:		To:	- ·	
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Circle Parameters Requested: EP Toxicity;	Priority Pollutant Scan;	PCB/Pesticides;	Identify/Compare	а. а.
the following:		the following PCB/Pesticides		3
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	and a participation of the state of the stat	Q-BHC	0.0	76
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	a substantion of the state of the			N-024346 R100567
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Priority	HAZARDOUS W. Organic Anal	ASTE LABORATORY	·	
1 P.1.6.51	US- TT SH		All minut	MINI-01
Collector: 1. C. Poliko [] Name/Tir	me/Date	_ Sample Source//2	CWATTON.	
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ircle Parameters Requested:	· · · · · · · · · · · · · · · · · · ·			÷,
	Priority Pollutant Scan;	BGB/Pesticides;	Identify/Compare	
C/MS analysis indicates the presence of the following:	<u> </u>	GC Analysis indicates the pr the following BCB/Pesticide	•	
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Section Chief:	<u>5</u> Date: <u>7-17-7</u>	9 Verified By: <u>RFR</u>	Authorized By:	
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	TRACE ORGANICS VOLATILE ORGAN		•	·9`
NUMBER JUP 051780	1-03 COLLECTOR J. C.	Polikoff	MDE/HSWMA	WAS H
OURCE OF SAMPLE	tral Chamical MW-1	· · · · · · · · · · · · · · · · · · ·		
Include Address)				- <u></u> -
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From:	· · · · · · · · · · · · · · · · · · ·	To:		¥
EMARKS:				
TRANS COUNTY TYPE 20 21 22 21 22 21 22 FIELD Purgeable Halocarbons (EPA Purgeable Halocarbons (EPA Pu	4       5       6       7       8       9       10         M       W       0       SAMPLING       SAMPLING       SAMPLING         1ELD RESID. CHLORINE: FREE       23         1ELD RESID. CHLORINE: FREE       23         1ELD RESID. CHLORINE: FREE       23         1COLORINE: FREE       23         1.1,2-Trichloropthene       1,1,2-Trichloropthane         2-Chloroethylvinylether       3         Bromoform       1,1,2,2,-Tetrachloroethane         1.1,2,2,-Tetrachloroethane       2         2       Total Trihalomethanes         2       1         2       1         2       1	$\frac{24}{\text{TOTAL}}$	4       15       16       17       18       1         COLLECTED       CARD       NO.       CARD       NO.         25       25       CARD       NO.         25       26       CARD       NO.         25       26       CARD       NO.         25       26       CARD       NO.         26       Time       I       C         Benzene       Toluene       Ethylbenzene       Total Xylenes         Total Purgeable Hydrocarb       Tetrahydrofuran       (2-Butanone MEK)         Methylisobutylketone (MIBH       Acrolein       Acrolein         Acrolein       Acrylonitrile       Carbon Disulfide         Vinyl Acetate       Acetone       2-Hexanone         Styrene       Styrene       Styrene	$\frac{1}{\frac{1}{\sqrt{2}}}$
,2-Dichloropropane	V		in	· · · ·
1, 2-Dichlorobenze	ine 2	· · · ·	- ·	
			•	
······································				
			· · · · · · · · · · · · · · · · · · ·	<u> </u>
	DATE AWALYZEN	<u>· 6-21·89</u>	CEN-0	24348
ATE RECEIVED 5-18-2	Results reported in micrograms pe	fer y han en	112 .	AR100569 AB. NO4M

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1 1 1 1 1 1	DEPARTMENT OF HEALTH AND MENTAL HYGIENE Laboratories Administration 201 W. Preston St.
	P.O. Box 2355, Baltimore, Maryland 21203 J. Mehsen Joseph, Ph.D., Director
	HAZARDOUS WASTE LABORATORY
riority	Organic Analysis Report Form
Collector J.C.	Poliket JE-17-59 sample Source Control Chancel MW-CE Name/Time/Date Hayens town
ample ID No	10P 051787-01 Preservative Used None
ample Alert	
pecify Program:	
	RCRA: X NPDES: OTHER:
hain of Custody S	Sample Possession
from:	Name/Time/Date
_	Name/Ime/Date
From:	Name/Time/Date Name/Time/Date
əm:	Name/Time/Date
C/MS analysis in	dicates the presence of GC Analysis indicates the presence of
	dicates the presence of GC Analysis indicates the presence of the following BEB/Pesticides: Q - BHC 1 ppb B - BHC 2 ppb - V - BHC (Lindane) 0.2 ppb
	the following BEB/Pesticides: <u>A-BHC</u> 1 ppb B-BHC 2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb
	the following DEP/Pesticides: <u>A-BHC</u> <u>1 ppb</u> <u>B-BHC</u> <u>2 ppb</u> <u>A-BHC</u> <u>0.5 ppb</u> <u>Dieldrin</u> <u>0.4 ppb</u> <u>1</u>
GC/MS analysis in the following:	He following BEB/Pesticides: <u>X-BHC</u> 1 ppb <u>B-BHC</u> 2 ppb <u>-X-BHC (Lindane)</u> 0.2 ppb

DEP	STATE OF MARY ARTMENT OF HEALTH AI Laboratories Admir 201 W. Preston J. Mehsen Joseph, Ph TRACE ORGANICS L VOLATILE ORGANIC	ND MENTAL HYGI histration Street .D., Director ABORATORY	ENE	(RED)
NUMBER JCP 051889-02			MDE/HSWMA	WASH.
SOURCE OF SAMPLE <u>Central Ch</u>	emical - Hazersto	un :	•···	
(Include Address)		<u> </u>	<u> </u>	
SAMPLE TYPE: Community				
Observation Well	Stream	_ Tidal Waters	Industrial Efflue	nt
Other (Specify)		· .	······································	<u></u>
Preservative Used 1+1			,	
IMPORTANT: First time sampled				
Reason for submitting sample:	Survey	Suspected Petro	Ieum Contamination	
Suspected Industrial Chemical C CHAIN OF CUSTODY: From:		Other (Specify	NOTIOE SECTION	IOM
From:	· · · ·	10: To:	ABTAW CNUCR	<del>}</del>
REMARKS:				
		· · · · · · · · · · · · · · · · · · ·		
	NOSAMPLING STATION	5 0 5 1 DATE 0 24 TOTAL	COLLECTED CARE NO. 25 26 COLLECTED CARE NO. 25 26 Collected Care Senzene Toluene Ethylbenzene Total Xylenes Total Yurgeable Hydrocart Tetrahydrofuran (2-Butanone MEK) Methylisobutylketone (MIB Acrolein Acrolein Acrolein Carbon Disulfide Vinyl Acetate Acetone 2-Hexanone Styrene	$\frac{4 0 0}{\frac{4}{\sqrt{2}}}$
			· · · ·	
		<u></u>	·	<u> </u>
	The second s		· · · · · · · · · · · · · · · · · · ·	
	Observed: Di	<u>chiorodenz</u> en	CEN-	024350
DATE RECEIVED DATE	IS reported in micrograms per TE REPORTED	14-89_CHEMIST		AR100571 AB. NO4M

• 	DEPARTMENT OF HEALTH A Laboratories Adm 201 W. Prest P.O. Box 2355, Baltimore J. Mehsen Joseph, F	ninistration on St.	29เรียง LAB NO. 79เรียง
PRIORITY	HAZARDOUS WASTE	LABORATORY	
			Ch - 1 Martin -
	Dikoff 05-18-89 Same/Time/Date	ample Source <u>Central</u>	Chemical MW-03
Sample ID No. <u>JC</u>	P 051889-02 Pr	eservative Used <u>HNO</u>	·
Sample Alert		· · · · · · · · · · · · · · · · · · ·	
Specify Program: F			
		•	OTHER:
	Sample Possession:		4 
From:	Name/Time/Date	· · · · · · · · · · · · · · · · · · ·	
		Name/	Time/Date
From:	Name/Time/Date	·	
	Hamer Siner Date	Name/	Time/Date
		······································	· · · · · · · · · · · · · · · · · · ·
Circle Type of Anal	ysis:	1997 - 1997 -	
1. EP Toxicity	2. Priority Pollutant	3. Total Metals	A Disadend Materia
, <b>,</b>		J. IOIAI MICIAIS	4. Dissolved Metals
ndicate Type of Sa _iquid	mple:Solid	· · · · · · · · · · · · · · · ·	Percent Solids%
	,	· · · · · · · · · · · · · · · ·	Percent Solids%
	,		Percent Solids%
	Solid Metals in p	om	· · ·
_iquid	Solid Metals in p	om <u>Element</u>	Percent Solids%
Element Antimony Arsenic	Solid Metals in p	om <u>Element</u>	EP Total
Element Antimony Arsenic Barium	Solid Metals in p EP	om <u>Element</u>	· · ·
Element Antimony Arsenic Barium Beryllium	Solid Metals in p EP	om <u>Element</u> Aluminum Calcium	EP Total
Element          Element         Antimony         Arsenic         Barium         Beryllium         Cadmium	Solid Metals in pr EP 	Dm <u>Element</u> Aluminum Calcium Cobalt	EP Total
Element Element Antimony Arsenic Barium Beryllium Cadmium Chromium	Solid Metals in p EP  	Dm <u>Element</u> <u>Aluminum</u> <u>Calcium</u> <u>Cobalt</u> <u>Magnesium</u> <u>Manganese</u> <u>Potassium</u>	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper	Solid Metals in pr EP 	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element  Antimony  Arsenic  Barium  Beryllium  Cadmium  Copper Iron	Solid	Dm <u>Element</u> <u>Aluminum</u> <u>Calcium</u> <u>Cobalt</u> <u>Magnesium</u> <u>Manganese</u> <u>Potassium</u>	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron Lead	Solid Metals in p EP Total 	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron Lead Mercury	Solid Metals in p <u>EP</u> Total <u>&lt;0.002</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.00</u>	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron Lead	Solid Metals in p EP Total 	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Copper Iron Lead Mercury Nickel	Solid Metals in p <u>EP</u> Total <u>&lt;0.002</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.00</u>	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron Icead Mercury Nickel Selenium	Solid Metals in p <u>EP</u> Total <u>&lt;0.002</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.05</u> <u>&lt;0.00</u>	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc	Solid Metals in pp EP 	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron Lead Mercury Nickel Selenium Silver Thallium	Solid Metals in p EP Total (0.002 (0.05 (0.05 (0.05 (0.05) (0.05) (0.05) (0.05) (0.05)	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EP Total
Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc	Solid Metals in pp EP 	DM Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	Total
Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc	Solid Metals in py <u>EP</u> Total <u>(0.002</u> <u>(0.05</u> <u>(0.05</u> <u>(0.05</u> <u>(0.05</u> <u>(0.05</u> <u>(0.05</u> <u>(0.05</u> ) <u>(0.05</u> <u>(0.05</u> ) <u>(0.05</u> ) <u>(0.05</u> ) <u>(0.05</u> ) <u>(0.05</u> ) <u>(0.05</u> ) <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.05)</u> <u>(0.5)</u> <u>(0.05)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u>(0.5)</u> <u></u>	Dm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium Vanadium	

P.O. BXX 2553 BARLINGS, MAYING 21200 HAZARDOUS WASTE LABORATORY PidetyOrganic Analysis Report Form Collector, J.C. Ritkolf, S. I.S.T. Some Source Scalars   Character MW- 0.5 New Time/Dec Sample NoOP 0.51 B.S.GOP 0.51 B.S.GDODDDDDDDDDDDDDDDDDDDDDDDDDDDD	بر بر ب		Laboratories Admi 201 W. Presto	ND MENTAL HYGIENE nistration n St.		TODO	in.
Perforty       Organic Analysis Report Form         Collector       1.C. Ritkow MW- 0.5         Name Time/Date       HagersTourn         Sample Nort       HagersTourn         Sample Nort       Sample Source (Samtra)         Specify Protextmic Used       Sample Source (Samtra)         RCRA:       M. NPOES:         OTHER:       Sample Source (Samtra)         RCRA:       M. NPOES:         OTHER:       Sample Source (Samtra)         From:       Name/Time/Date         Name/Time/Date       Name/Time/Date         From:       Name/Time/Date         Name/Time/Date       Name/Time/Date         Of Analysis indicates the presence of       OC Analysis indicates the presence of         Clude Parameters:       Republic         QC/MS analysis indicates the presence of       OC Analysis indicates the presence of         Clude Parameters:       Charlestage         Q = B HC       1 ppb         Q = B HC		P.	J. Mehsen Joseph, Ph	D., Director	LAB. NO.	790963	• · · ·
Collector         Lie Childre ff         Starple Source Garba Chautical MW- 05           Sample DNo.         Macket Starple Source Garba Chautical MW- 05           Sample Alert         Semple Alert           Specify Program:         RCA:           RCA:         NPDES           OTHER         New/The/Date           From:         New/The/Date           New/The/Date         To:           New/The/Date         New/The/Date           From:         New/The/Date           New/The/Date         New/The/Date           From:         New/The/Date           New/The/Date         New/The/Date           From:         New/The/Date           New/The/Date         New/The/Date           Circle Parameters Repeated:         New/The/Date           EF Positivity         Priority Politikits Sam;         Differentiation;           GC/MS analysis indicates the presence of         GC Analysis indicates the presence of           GC/MS analysis indicates the presence of         GC Analysis indicates the presence of           GC/MS analysis indicates the presence of         GC Analysis indicates the presence of           GC/MS analysis indicates the presence of         GC Analysis indicates the presence of           GE B HC         9 pp b <td< td=""><td></td><td></td><td></td><td>and the second second</td><td></td><td><u> </u></td><td></td></td<>				and the second		<u> </u>	
Name/Trac/Date     Hagersiau/1       Sample D No. <u>V1 051869-02</u> Preservative Used       Sample Alert	Priority		Organic Analysis R	eport Form	· ·		
Sample Alert		Name/Time/Date		· Ha	rectour	MW-05	·
Specify Program:	Sample ID No.	P 051889-02	Pre	servative Used	J	, 	<b></b>
Specify Program: RCRA:	Sample Alert				<u> </u>		
Chain of Custody Sample Possession          From:       Name/Time/Date       To:       Name/Time/Date         From:       Name/Time/Date       To:       Name/Time/Date         In:       Name/Time/Date       Name/Time/Date       Name/Time/Date         Chride Parameter: Requested:       EP Toxichy:       Priority Poliniant Scan:       DEE Generative Compare         GC/MS analysis indicates the presence of the following:       CA nalysis indicates the presence of the following PCD/Particles:       A - B HC       \$ ppb         Q - B HC       4 ppb       X - B HC       4 ppb         X - B HC       9 ppb       X - B HC       9 ppb         Section Chief:       Date: 7=12~f f       Verified By: RER       Autorized By:	Specify Program:	- :	oryg_va vær sy tir orter		- <b></b> .		
From:       Name/Time/Date         From:       Name/Time/Date         m:       Name/Time/Date         Maine/Time/Date       Name/Time/Date         m:       Name/Time/Date         Maine/Time/Date       Name/Time/Date         m:       Name/Time/Date         Maine/Time/Date       Name/Time/Date         Child Parameters Requested:       Name/Time/Date         EP Toxitchy:       Priority Politikin Scan;         CCMS analysis indicates the presence of       GC Analysis indicates the presence of         Maine/Time/Date       Q_mode/Time/Date         Q_mode/Time/Date       Q_mode/Time/Date         Q_mode/Time/Date       Q_mode/Time/Date         Maine/Time/Date       Q_mode/Time/Date         <		RCRA: <u>V</u> NPDES: _	OTHER: _		<u></u>		
Nume/Time/Date     To:     Nume/Time/Date       From:     Nume/Time/Date     To:     Nume/Time/Date       In:     Nume/Time/Date     Nume/Time/Date     Nume/Time/Date       Cricle Parameters Requested:     EP 7 toxicity:     Priority Pollutiant Scars;     PC2/EntitidEs     Identify/Compare       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of     Identify/Compare       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of     Section Chief:       Section Chief:     Date: n=12*11     Verified By: RER     Authorized By:	Chain of Custody Sa	mple Possession			-		
Nume/Time/Date     To:     Nume/Time/Date       From:     Nume/Time/Date     To:     Nume/Time/Date       In:     Nume/Time/Date     Nume/Time/Date     Nume/Time/Date       Cricle Parameters Requested:     EP 7 toxicity:     Priority Pollutiant Scars;     PC2/EntitidEs     Identify/Compare       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of     Identify/Compare       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of     Section Chief:       Section Chief:     Date: n=12*11     Verified By: RER     Authorized By:	From		terret terret in the second	·+			
Name/Time/Date     Name/Time/Date       In:     Name/Time/Date       Circle Parameters Requested:     EP Toxicity;       EP Toxicity;     Priority Politikint Scan;       ØC/MS analysis indicates the presence of     OC Analysis indicates the presence of       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of       Mame/Time/Date     Identify/Compare         GC/MS analysis indicates the presence of     OC Analysis indicates the presence of         GC/MS analysis indicates the presence of     OC Analysis indicates the presence of         GC/MS analysis indicates the presence of     OC Analysis indicates the presence of         GC/MS analysis indicates the presence of     GC Analysis indicates the presence of         GC/MS analysis indicates the presence of     GC Analysis indicates the presence of         GC/MS analysis indicates the presence of     GC Analysis indicates the presence of         GC/MS analysis indicates the presence of     GC Analysis indicates the presence of         GC/MS analysis     GC/MS analysis         G	·	Name/Time/Date			Name/Time/Date	······································	•
ni	From:		To:			 	<b></b>
Name/Time/Date     Name/Time/Date       Circle Parameters Requested:     EP Toxicity:     Priority Polluiant Scan:     PREVENTION:       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of     the following:       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of       GC/MS analysis indicates the presence of     OC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis indicates the presence of     GC Analysis indicates the presence of       GC/MS analysis     GC Analysis indicates the presence of       GC/MS ana							
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EP Toxicity:       Priority Pollitians Scan:       PERFERIENCE       Identify/Compare         GC/MS analysis indicates the presence of the following:       OC Analysis indicates the presence of the following PCB/Posticides:       Identify/Compare         Q-BHC       8 ppb         Q-BHC       4 ppb         X-BHC       9 ppb         X-BHC		and a second a second a second a second a second a second a	<u></u>	renser strage	- • • • • • • · · · · · · · · · · · · ·		• - ,-····
GC/MS analysis indicates the presence of the following:       GC Analysis indicates the presence of the following PCB/Pesticides:         Q - B HC       8 ppb         Q - B HC       4 ppb         Q - B HC       9 ppb      <	Circle Parameters Re	quested:		<del>-</del>			:
GC/MS analysis indicates the presence of the following:       CC Analysis indicates the presence of the following PCB/Pesticides:         Q - B HC       4 ppb         Q - B HC       4 ppb         Q - B HC       9 ppb         Q - B HC       9 ppb         A - B HC       9 ppb         Section Chief:       Date:         Date:       Date:         Date:       Date:         CEN-024352       Authorized By:		EP Toxicity; Priority	Pollutant Scan;	PCB/Pesticides;			
A=BHC 9 ppb				X-BHC Z-BHC	8	ppb	<b>.</b>
Section Chief: $DI$ Date: $D = 1 \ge -3 \uparrow$ Verified By: $RER$ Authorized By: CEN-024352	·			8-BHC (1	indane) 3	ppb	-
CEN-024352	<b>—</b> ———————————————————————————————————	ى ھەرى <u>مەرىپى مەرىپى مەرىپى</u>		A-BHC	9	ppb	<b>_</b>
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	<u></u>	Section Chief: D	nte: <u>]-12-7</u> 9 Veri	fied By: <u>RF</u> R	Authorized By:		• •
	DHMH 4320-C 10/87	· · · · · ·	HEALTH DEPARTM	IENT	CEN-024352	A <mark>₹±0</mark> 0573	  1

	201 W. F P.O. Box 2355, Balti J. Mehsen Jose	Administration Preston St. more, Maryland 21203 ph, Ph.D., Director	290969 LAB NO
	HAZARDOUS WAS	STE LABORATORY	
Collector J.C. Poliku	05-18-89 Name/Time/Date	Sample Source <u>Centra</u>	2 Chemical MW-03
Sample ID No. JCP051	889-01	Preservative Used HN(	)3
Sample Alert		-, <u></u>	
Specify Program:	:XNP	i i i i i se da se	OTHER:
Chain of Custody Sampl	le Possession:		
From:	entre planet gaard	. To:	/
	Name/Time/Date		ne/Time/Date
From:	Name/Time/Date	To:	ne/Time/Date
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Indicate Time of Sample	· · · · · · · · ·		· · · · · · · · · · · · · · · ·
Indicate Type of Sample	Solid		Percent Solids%
Liquid	Solid Metals	in ppm	
Liquid	Solid	Element	Percent Solids%
Liquid 'Element	Solid Metals	Element	
Liquid	Solid Metals	Element	
Element Element Antimony Arsenic Barium Beryllium	Solid Metals <u>EP Total</u>     	Element Aluminum Calcium Cobalt Magnesium	
Liquid 'Element Antimony Arsenic Barium Beryllium Cadmium	Solid Metals 	Element Aluminum Calcium Cobalt Magnesium Manganese	
Liquid 'Element Antimony Arsenic Barium Beryllium Cadmium Chromium	Solid Metals <u>EP Total</u> <u>40,0072</u> <u>&lt;0,5</u> <u>&lt;0,5</u>	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium	
Liquid Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper	Solid Metals 	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	
Liquid 'Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron	Solid Metals <u>EP Total</u> <u>40,0072</u> <u>40,5</u> <u>40,5</u> <u>40,5</u> <u>40,5</u>	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium	
Liquid Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Copper Iron Lead	Solid 	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	
Liquid 'Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron	Solid Metals <u>EP Total</u> <u>40,0072</u> <u>40,5</u> <u>40,5</u> <u>40,5</u> <u>40,5</u>	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Chromium Iron Lead Mercury	Solid 	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	
'Element   Antimony   Arsenic   Barium   Beryllium   Cadmium   Chromium   Copper   Iron   Lead   Mercury   Nickel	Solid 	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	
Liquid 'Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium	Solid 	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EPTotal
Liquid 'Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc	Solid	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	EPTotal
Liquid 'Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium	Solid Metals 	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	
Liquid Element Antimony Arsenic Barium Beryllium Cadmium Cadmium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc U Chromium Cr+6	Solid	Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium Vanadium	      

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	TRACE ORGANICS L VOLATILE ORGANIC			
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OURCE OF SAMPLE CENTR	al Chemical - Hayerst	own		•
nclude Address)	0			
AMPLE TYPE: Community	Noncommunity	Domestic	STP Station	
Observation Well	Stream	Tidal Waters	Industrial Effluen	t
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Preservative Used				
MPORTANT: First time sampled _	Last known sam	noling date		
· -	ng sample: Survey			
	Chemical Contamination	Other (Specify	1	*
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From:		To:	. V . Antonio Marine Ma	
REMARKS:		<u></u>	GOAT SI AON	· · · · · · · · · · · · · · · · · · ·
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TYPE	STATION		NO.	•
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	LD RESID. CHLORINE: FREE			48
Purgeable Halocarbons (EPA	601)	· · · · · · · · · · · · · · · · · · ·	Other Purgea	bles
		n and an		< /
'hloromethane	>.5 "trans-1.3-Dichloropropene	$\sim$ 1	Ronzano	
	≤ <u>5</u> trans-1,3-Dichloropropene ≤ <u>1</u> Trichloroethene		Benzene Toluene	 
romomethane			Toluene	Ţ.
romomethane lichlorodifluoromethane	<u>&lt;∫</u> Trichloroethene		Toluene Ethylbenzene	42
romomethane lichlorodifluoromethane inyl choride	✓ / Trichloroethene ↓ Dibromochloromethane		Toluene	
romomethane hichlorodifluoromethane inyl choride hloroethane	Trichloroethene       Dibromochloromethane       1,1,2-Trichloroethane		Toluene Ethylbenzene Total Xylenes	
romomethane lichlorodifluoromethane inyl choride hloroethane fethylene chloride	Trichloroethene       Dibromochloromethane       1,1,2-Trichloroethane       cis-1,3-Dichloropropene		Toluene Ethylbenzene Total Xylenes Total Purgeable Hydrocarbo	
Fromomethane Dichlorodifluoromethane Finyl choride Chloroethane Aethylene chloride	Image: Constraint of the second state of the second sta		Toluene Ethylbenzene Total Xylenes Total Purgeable Hydrocarbo Tetrahydrofuran	
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Chloromethane Bromomethane Dichlorodifluoromethane Finyl choride Chloroethane Methylene chloride richlorofiluoromethane Dichloroethene ,1 - Dichloroethane rans-1,2- Dichloroethene	Image: Second state sta		Toluene Ethylbenzene Total Xylenes Total Purgeable Hydrocarbo Tetrahydrofuran (2-Butanone MEK) Methylisobutylketone (MIBK	
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Bromomethane Dichlorodifluoromethane Finyl choride Chloroethane Aethylene chloride Tichlorofluoromethane Dichloroethene ,1 - Dichloroethane rans-1,2 - Dichloroethene Chloroform ,2 - Dichloroethane Carbon Tetrachloride Formodichloromethane ,2 - Dichloropropane	Image: Construction of the second state of the second s		Toluene Ethylbenzene Total Xylenes Total Purgeable Hydrocarbo Tetrahydrofuran (2-Butanone MEK) Methylisobutylketone (MIBK Acrolein Acrylonitrile Carbon Disulfide Vinyl Acetate Acetone 2-Hexanone Styrene	
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Bromomethane Dichlorodifluoromethane Finyl choride Chloroethane Aethylene chloride Tichlorofluoromethane Dichloroethene ,1 - Dichloroethene chloroform ,2 - Dichloroethane Carbon Tetrachloride Formodichloromethane ,2 - Dichloropropane	Image: Construction of the second state of the second s	<ul> <li>✓</li> <li>✓</li></ul>	Toluene Ethylbenzene Total Xylenes Total Purgeable Hydrocarbo Tetrahydrofuran (2-Butanone MEK) Methylisobutylketone (MIBK Acrolein Acrylonitrile Carbon Disulfide Vinyl Acetate Acetone 2-Hexanone Styrene CEN	

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		eph, Ph.D., Director	LAB. NO.	····
Priority	HAZARDOUS W. Organic Anal	ASTE LABÓRATORY		
IC DULL CL.	a second a second s	, the second second restored as a second	Aliman	MW-03
Collector J.C. PallCort Name/T	lime/Date - =		Jerstown	
Sample ID No. 1. (. Pa 05	1000 01	Preservative Used	j	·
		verser of the second state		
RCRA:	NPDES:OT	THER:	,,,,	
Chain of Custody Sample Possession				
From:		Tō:		
Name/T	ime/Date		Name/Time/Date	
From:Name/T	ime/Date		Name/Time/Date	1
m:		To:		1
	'ime/Date		Name/Time/Date	·····
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Circle Parameters Requested:		······································		
EP Toxicity;	Priority Pollutant Scan;	PCB/Pesticides;	Identify/Compare	
· · · · · · · · · · · · · · · · · · ·		Q - BHC $\overline{\beta} - BHC$ $\overline{A} - BHC$	<u> </u>	<u>}</u>
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Section Chief: 🖵	)5 Date:7-/8-29	Verified By: <u>RFR</u> A	authorized By:	
DHMH 4320-С 10/87	HEALTH DEF	PARTMENT	CEN-024355	5 AR1 776 5M

	DEPARTMENT OF HEAL Laboratorie 201 W. P.O. Box 2355, Balt	F MARYLAND TH AND MENTAL HYGIENE s Administration Preston St. timore, Maryland 21203 eph, Ph.D., Director	790965 LAB NO
		ASTE LABORATORY	
	Metals Analy	sis Report Form	
Collector J. C. Pc	011kott 05-18-89	Sample Source Central C	homical MW-02.
	Name/Time/Date		
Sample ID No. JCP	051889-03	Preservative Used HNO-	>
Sample Alert	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
Specify Program:	in in internet in		
RCR	A: NI	PDES:HUH	OTHER
Chain of Custody Sam	ple Possession:	· · · -	
-			L 1989
From:	Name/Time/Date	Name/T	ime/Date
Erom.	. , <u></u> .	Name/Ti ROUTIOWATER	AND SPECIAL TONNISION
From:	Name/Time/Date		ime/Date
			• - <sub>T</sub>
Circle Type of Analysis	• • • • • • • • • • • • • • • • • • •		
1. EP Toxicity	2. Priority Pollutant	3. Total Metals	4. Dissolved Metals
Indicate Type of Sampl	le: Solid		Percent Solids%
			Percent Solids%
	Solid	s in ppm	Percent Solids%
Liquid	Solid	s in ppm Element	Percent Solids%
Element	Solid Metal EPTotal	s in ppm <u>Element</u> Aluminum	_EPTotal
Element Antimony	Solid Metal 	s in ppm Element Aluminum Calcium	,
Element Antimony Arsenic Barium	Solid Metal EPTotal	s in ppm <u>Element</u> <u>Aluminum</u> <u>Calcium</u> <u>Cobalt</u>	_EPTotal
Element - Antimony - Arsenic - Barium Beryllium	Solid Metal O.ol 	s in ppm Element Aluminum Calcium Cobalt Magnesium	_EPTotal
Element Antimony Arsenic Barium Beryllium	Solid Metal O.01   	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese	_EPTotal
Element Antimony Arsenic Barium Beryllium Cadmium	Solid Metal    	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium	_EPTotal
Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper	Solid Metal O.01   	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	_EPTotal
Element Antimony Arsenic Barium Beryllium Chromium Copper Iron	Solid Metal    	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium	_EPTotal
Element Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron Lead	Solid Metal     	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	_EPTotal
Element Element Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Iron Lead Mercury	Solid 	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	_EPTotal
Element  Antimony  Arsenic  Barium Beryllium  Copper Iron Lead Mercury VNickel	Solid Metal     	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	_EPTotal
Element  Antimony  Arsenic  Barium Beryllium  Cadmium  Copper Iron Iron Lead Mercury VNickel Selenium	Solid 	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	_EPTotal
Element  Antimony  Arsenic  Barium  Beryllium  Chromium  Chromium  Copper Iron  Lead  Mercury  Nickel  Selenium  Silver	Solid 	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	_EPTotal
Element  Antimony  Arsenic  Barium Beryllium  Chromium  Chromium  Copper Iron Lead Mercury  Nickel Selenium Silver Thallium	Solid 	s in ppm  Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium Vanadium	_EPTotal
Element  Antimony  Arsenic  Barium  Beryllium  Chromium  Chromium  Copper Iron  Lead  Mercury  Nickel  Selenium  Silver	Solid         EP       Total         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5         40.5	s in ppm Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium	_EPTotal
Element Antimony Arsenic Barium Beryllium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc	Solid 	s in ppm  Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium Vanadium	
Element Antimony Arsenic Barium Beryllium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc V Chromium Cr+6	Solid         EP       Total         0.01       40.5         40.5       <0.5	s in ppm  Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium Vanadium	
Element Antimony Arsenic Barium Beryllium Cadmium Copper Iron Lead Mercury Nickel Selenium Silver Thallium Zinc V Chromium Cr+6	Solid Metal <u>EP</u> Total <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.5</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>40.55</u> <u>50.001</u> <u>40.55</u> <u>50.001</u> <u>40.55</u> <u>50.001</u> <u>40.55</u> <u>50.001</u> <u>40.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.55</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u> <u>50.001</u>	s in ppm  Element Aluminum Calcium Cobalt Magnesium Manganese Potassium Sodium Vanadium Uanadium DMREVERSE SIDE OF THIS FO	

TRACE ORGANICS VOLATILE ORGAN	ND MENTAL HYGIENE	REDAN
NUMBER JCP 051889-03 COLLECTOR JC	Polikoff MDE/HSU	UMA WASH
SOURCE OF SAMPLE Central Chemical Hayers		County
	02452	
(Include Address)NoncommunityNoncommunity		
SAMPLE TYPE: CommunityNoncommunity Observation Well Stream		
$ + $ $  _{\sigma_1}$		······································
IMPORTANT: First time sampled Last known sa	noling date	·
Reason for submitting sample: Survey		HON VILLE VALLE
Suspected Industrial Chemical Contamination		NEAVELU
CHAIN OF CUSTODY: From:	To:	
From:		696T ST ACN
REMARKS:		<u></u>
		TODICO WATER
TRANS COUNTY PLANT NO. SAMPLING STATION	Z 0 5 1 8 8 9 DATE COLLECTED	18 19 CARD NO.
20 21 22 FIELD		1630
PH		
Purgeable Halocarbons (EPA 601)	O	ther Purgeables
Chloromethane	<u> </u>	19
Bromomethane $\leq I$ Trichloroethene		</td
Dichlorodifluoromethane Dibromochloromethane	Ethylbenzene	<u>5</u>
/inyl choride1,1,2-Trichloroethane	Total Xylenes	
Chloroethane	-	e Hydrocarbons
Methylene chloride2-Chloroethylvinylether	<u>≤///</u> Tetrahydrofurau ≤// (2-Butanone M	
Trichlorofluoromethane <u>Bromoform</u>	(2-Butanone M	•
- Dichloroethane		
rans-1,2-Dichloroethene Chlorobenzene	<u>182</u> Acrylonitrile	
Chloroform	Carbon Disulfid	le , · ·
,2-Dichloroethane r Other Purgeable	Organics: Vinyi Acetate	
,1,1-Trichloroethane	Acetone	168
Carbon Tetrachloride	2-Hexanone	
iromodichloromethane	Styrene	
,2-Dictiloropropane		70
	1 sopage	alcohol 250
	and a second	
		in the second
<u>observed</u> Dicalorolenzene		CEN-024357
HIMH 749 5/88 BATE RECEIVED 5/19/89 DATE REPORTED 11-12 BATE RECEIVED 5/19/89 DATE REPORTED 11-12 BATE AN ARY 2ED: 5	1-89 CHEMIST Conn	19192 AB199578

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			lltimore, Maryland 21203 eph, Ph.D., Director	LAB. NO	/36200 -
·			ASTE LABORATORY		
Priority		Organic Ana	lysis Report Form		•
Collector J.C. 1	Name/Tim	5-18.89	Sample Source Cntra	[Chemical MV	V-02
			Flac Preservative Used	yerstown	
	-7				
			<u> </u>		<u> </u>
Specify Program:			HER:		I
Chain of Custo in Sec			HER:	-	<u></u>
Chain of Custody Sa					•
From:	Name/Tim	e/Date		Name/Time/Date	· · · ·
From:		······································	<b></b>	· ···· _·	
_	Name/Tim	e/Date	· · · · · · · · · · · · · · · · · · ·	Name/Time/Date	
om:	Name/Time	e/Date	To:	Name/Time/Date	<u></u>
<u></u>			<u> </u>		<u> </u>
Circle Parameters Re	quested:	·			<b>†</b>
•	EP Toxicity;	Priority Pollutant Scan;	PCB Pesticides;	Identify/Compare	1
the following:			the following PCB/Pestic $\propto -BHC$	ides:	pb
			B-BHC	<u> </u>	/
<u></u>	<u></u>	•• • • • • • • • • • • • • • • •	A-BHC	12 ppk	<b>)</b>
<b></b>			: . 	¥ /	······
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<u> </u>	<u> </u>	. <u></u>	<u>. موجد میشد. بر بر میشد.</u> در میشور میشود.	. <u></u>	<u></u>
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·		<u> </u>		· · · · · ·	
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	Section Chief: 0	Date: 7-18-8	9 Verified By: <u>RFR</u>	Authorized By:	
DHMH 4320-C 10/87	' 	HEALTH DEI		CEN-024358	AR1(1979) SM

4	DEPARTMENT OF HEALTH AND Laboratories Administra 201 W. Preston Stre- J. Mehsen Joseph, Ph.D., TRACE ORGANICS LAB	ation set Director	REDAR
	VOLATILE ORGANICS LAB	-	
IMBER PROFILERY JC	P 051 789-02 COLLECTOR J.C. Po	likoff MDE/HSWMA	WASH
DURCE OF SAMPLE (ent	21 Chamical Hacerotown	- MW-07	County
clude Address)	0	· · · · · · · · · · · · · · · · · · ·	
MPLE TYPE: Community	Noncommunity	DomesticSTP	Station
Observation We	II Stream T	īdal Waters Industri	al Effluent
Other (Specify)		Diran	
Preservative Us			Fn
PORTANT: First time sampled	•	•	
Heason for submit	ting sample: Survey		
•			
From:	· · · · · · · · · · · · · · · · · · ·	TO INVESTICATER AND SI	PECIAL
MARKS:			ION
·			·····
	4 5 6 7 8 9 10 11	12 13 14 15 16 17	16 19
	MW07	05\$789	
TRANS COUNTY TYPE	PLANT NO. SAMPLING STATION	DATE COLLECTED	CARD NO.
20 21 22	23 24	25 26	
		TOTAL Time	1500
urgeable Halocarbons (EPA	601	Othe	r Purgeables
loromethane	<5 trans-1,3-Dichloropropene	Benzene	$\leq 1$
omomethane		Toluene	
chlorodifluoromethane	Dibromochloromethane	Ethylbenzene	<u><u><u>y</u></u></u>
nył choride	1,1,2-Trichlorgethane	Total Xylenes	$\leq \lambda_{-}$
loroethane	<u>cis-1,3-Dichloropropene</u> 2-Chioroethylvinylether	$\frac{\Psi}{\leq !!!}$ Total Purgeable H $\frac{1}{\leq !!!!}$ Tetrahydrofuran	vidrocarbons
hiorofluoromethane	Bromoform	(2-Butanone MEK	
Dichloroethene	1,1,2,2,-Tetrachloroethane	Methylisobutylketo	1
-Dichloroethane	2 Tetrachloroethene	Acrolein	
ns-1.2-Dichloroethene			· · · · · · ·
ns-1,2-Dictiordemene	Total Trihalomethanes	Carbon Disulfide	<u> </u>
loroform –	Ciber Burgeshie Orge		1
loroform –	Cher Purgeable Orga		
loroform - Dichloroethane ,1 - Trichloroethane	C   Other Purgeable Org:	Acetone	
oroform – -Dichloroethane ,1-Trichloroethane rbon Tetrachloride	<pre>     Other Purgeable Org:  </pre>	Acetone 2-Hexanone	
loroform – -Dichloroethane ,1-Trichloroethane rbon Tetrachloride pmodichloromethane	Other Purgeable Orgi	Acetone	
loroform – -Dichloroethane ,1-Trichloroethane rbon Tetrachloride pmodichloromethane	C   Other Purgeable Orgi	Acetone 2-Hexanone	
loroform – -Dichloroethane ,1-Trichloroethane rbon Tetrachloride pmodichloromethane	Cher Purgeable Orgi	Acetone 2-Hexanone	
loroform – -Dichloroethane ,1-Trichloroethane rbon Tetrachloride pmodichloromethane	Other Purgeable Org:	Acetone 2-Hexanone	
loroform – -Dichloroethane ,1-Trichloroethane rbon Tetrachloride pmodichloromethane	Cher Purgeable Orgi	Acetone 2-Hexanone	
loroform 2-Dichloroethane 1,1-Trichloroethane arbon Tetrachloride omodichloromethane	Other Purgeable Orga	Acetone 2-Hexanone	
loroform – 2-Dichloroethane 1,1-Trichloroethane arbon Tetrachloride omodichloromethane		Acetone 2-Hexanone	
Aloroform 2-Dichloroethane 1,1-Trichloroethane Aloron Tetrachloride comodichloromethane 2-Dichloropropane		AcetoneAcetoneStyrene	
loroform - Dichloroethane ,1-Trichloroethane rbon Tetrachloride pmodichloromethane		AcetoneAcetoneStyrene	CEN-024359

	DEPAR	TMENT OF HEALT Laboratories 201 W. 1 P.O. Box 2355, Balti	MARYLAND TH AND MENTAL HYGIEN Administration Preston St. imore, Maryland 21203		CRIEINAL RED VAL
	TY.		h, Ph.D., Director	LAB. NO	<u></u>
Priority	111 	Organic Analy	sis Report Form		
Collector	Peliko († 05 Name/Time/Date	17-81	Sample Source Countre	t Chamical	MW-07
Sample ID No. 10	P051789-02		Preservative Used		1 1 1
Sample Alert		<del>nantiader</del> tense 👫 derfor die ern	an a		î.î
Specify Program:		-			
	RCRA: NPDES	: OTH	ER:		<u></u>
Chain of Custody Sa					
From:	Name/Time/Date		To:	Name/Tîme/Date	· .
From:			To		
• • • • • • • • • • • • • • • • • • •	Name/Time/Date			Name/Time/Date	
om:	Name/Time/Date	an and the second s	To:	Name/Time/Date	· 
			97 8 4 4 4 1 1 1 1 4 4 1 1 1 1 1 1 1 1 1 1	<u> </u>	
Circle Parameters Re		- ·			ι,
		y Pollutant Scan;	PSB/Pesticides:	Identify/Compare	;
GC/MS analysis indi	_		GC Analysis indicates the p the following $\mathbb{R}\mathbb{B}/\mathbb{P}$ esticid		: 
			Q - BHC	40 ppb	
·		<u></u>	X-BHC (Lind	ane) [ppb]	·
	<u>مەركە مىزى ھەرەر بەر مىرىدى ئېرىكە مىس</u>	<u></u>	A-BHC	8 ppb_	<u> </u>
		1979-10 (1187-1-1-1-1-1-1-1-1746-7	Dieldrin	<u> </u>	
		<u></u>	Endrin	<u>3ppb_</u> _	
		1998 - <u>1997 - 1997 - 1997 - 1997 - 19</u>			<u></u>
	- COLOR TO ALL AND THE COLOR OF AN	مەرىكە - ئەرىپىلىرى بىلەرسىمەن - ئەرىپ - تەرىكە مەرىكە - ئەرىپىلىرى	7	······································	<u> </u>
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<u> </u>	an a			18	<u>    t                                </u>
	<u></u>	<u> </u>	en <u>er er en </u>		· · · · · · · · · · · · · · · · · · ·
<u></u>				<u> </u>	
		<u></u>	and the second sec		
••			and a second		
	Section Chief: DS	Date: 7-18-89	Verified By: <u>RFR</u>	Authorized By:	
DHMH 4320-C 10/87	:	HEALTH DEP		CEN-024360	AR10

		P.O. Box 235	201 W. Preston St. 5, Baltimore, Mar n Joseph, Ph.D.,	yland 21203	LAB NO.	يسم مر - مر
PRIORITY			S WASTE LAE	ORATORY	· ·	
Online 1	O.Likafi	05-17:5	9	The Lin	Consideration and -	0
	Name/Time/	<u></u> Date	',∠ Sampl	e Source UN IT.	Chemical MN-C	
Sample ID No	10: 051789 -	<u>c</u> 1	Preser	vative Used HNC	) — · · · · · · · · · · · · · · · · · ·	
Sample Alert		·	. <i>,</i>	<u> </u>		
	am: RCRA:			· · · · · · · · · · · · · · · · · · ·		-
	RCRA:		NPDES:	يوهني مو <del>ميني</del> داده مرد مري <mark>بي م</mark> ير	- OTHER:	<u> </u>
	ody Sample Possessio			· · · · ·		
From:			To:		·	
	Name/Time/D	-14		hlamaal	/Time/Date:	
From:	- · · · · ·	:	т <u>ь.</u>	INVESTICATION	STT SINISION	
· · · · · · · · · · · · · · · · · · ·	Name/Time/D	ate	IV <u>,</u>	Name/	/Time/Date	
						_
Dirolo Tro	Anchain	<u>_</u>	,	<u></u>	· · ·	
Circle Type of	-	· ·			I .	
1. EP Toxicity	2. Pric	ority Pollutant	Ċ	3. Total Metals	4. Dissolved Me	etals
	· · ·	· · · · · · · · · · · · · · · · ·		<u></u>	·	
_iquid <u>X</u>		Solid _			Percent Solids	
		<b>i</b>	Metals in ppm			
Elemen	t <u>EP</u>	Total		Element	EPTo	tal
Antimony			$_{\mathbf{k}}$ = $22$ = $226$	Aluminum		<u> </u>
Arsenic			··· : [		61	0
Barium	- 	40.5	5. s. s <del>4</del>	Cobalt	·	<del></del>
<ul> <li>Beryllium</li> <li>Cadmium</li> </ul>	, <u></u> _, , , , <u></u>		T T T T T T T	Magnesium	·	<u> </u>
Cadmium Chromium	<u>ن میں ت</u> ر ۲۰ میں وئی <sub>کر</sub> بار	<0.5	1 (1/ <del>4</del> ) - 41	Manganese		<del></del>
Copper	, , , , <sup>g</sup>	0.0		Sodium		····
Iron				Vanadium	·	<u> </u>
Lead		40.5			· ·	·
Mercury		40.00 <sup>1</sup>	······································	1		
✓ Nickel		< 0.5	**		i	· ·
			ور در م است		<u></u>	
Selenium	······································					, ,
Silver	•					·
Silver Thallium			Ī		<b></b>	
Silver Thallium Zinc		 ت <u>ىر بەر شەرىيە مەرىمە مەر</u> رىيە مەر				-
Silver Thallium	Cr+6 ¥ and	lysis cannot	» performed		<u> </u>	
Silver Thallium Zinc		on fixed Jam	ple.	RSE SIDE OF THIS F		

Laboratories Administration         201 W. Presen: Street         J. Mehsen. Joseph, Ph.D., Director         TRACE ORGANICS LABORATORY         VOLATILE ORGANICS ANALYSIS         BOTTLE         NUMBER       J.C. Dollact Ff. MDE/HSWMA         WAS H.         Country         SOURCE OF SAMPLE         Central Chemical         MW- G         County         SOURCE OF SAMPLE         Central Chemical         MW- G         County         Donestic         STP Station         Observation Well         V         Stream         Tidal Waters         Industrial Effluent         Other (Specify)         Preservative Used         HCI         H2         MPORTANT:         First time sampled         Last known sampling date         Reason for submitting sample: Survey         Suspected Industrial Chemical Contamination         Other (Specify)         July         Suspected Industrial Chemical Contamination         Other (Specify)         From:         To:         GROUNDWATER AND SPECIAL
TRACE ORGANICS LABORATORY VOLATILE ORGANICS ANALYSIS         BOTTLE JCP 051789-01 COLLECTOR JC Poliko ff MDE/HSWMA WASH. County         SURCE OF SAMPLE Central Chemical MW-6         County         SOURCE OF SAMPLE Central Chemical MW-6         County         SAMPLE TYPE: Community Noncommunity Domestic STP Station         Observation Well Stream Tidal Waters Industrial Effluent         Other (Specify)         Preservative Used HCL I+1         IMPORTANT: First time sampled
VOLATILE ORGANICS ANALYSIS         BOTTLE JCP 051789-01 COLLECTOR JC Poliko ff MDE/HSWMA WASH.         NUMBER JCP 051789-01 COLLECTOR JC Poliko ff MDE/HSWMA WASH.         SOURCE OF SAMPLE Central Chemical MW-6         SOURCE OF SAMPLE Central Chemical MW-6         SAMPLE TYPE: Community Noncommunity Domestic STP Station         Observation Well M Stream Tidal Waters Industrial Effluent         Observation Well M Stream Stream Other (Specify)         Preservative Used HCI It1         NONCOMMUNITY Suspected Petroleum Contamination         Other (Specify)         YEI Station Suspected Industrial Effluent         Other (Specify)         YEI Station Suspected Industrial Effluent         Other (Specify)         YEI Station         Suspected Industrial Effluent         Other (Specify)         YEI Station         Suspected Industrial Contamination         Other (Specify)         YEI Station         Suspected Industrial Contamination         Suspected Petroleum Contamination         Suspected Industrial Chemical Contamination         To: GROUNDWA
SOURCE OF SAMPLE       Central Chemical MW-6         SAMPLE TYPE:       Community       Domestic       STP Station         Observation Well       V       Stream       Tidal Waters       Industrial Effluent         Other (Specify)
Include Address)
SAMPLE TYPE:       Community
Observation Well       ✓       Stream       Tidal Waters       Industrial Effluent         Other (Specify)
Other (Specify) Preservative Used HCI HI MPORTANT: First time sampledLast known sampling date Reason for submitting sample: SurveySuspected Petroleum Contamination Suspected Industrial Chemical ContaminationOther (Specify)Suspected Industrial Chemical ContaminationOther (Specify)Suspected Industrial Chemical ContaminationOther (Specify)Suspected Petroleum ContaminationSuspected Industrial Chemical ContaminationSuspected Petroleum ContaminationSuspected Industrial Chemical ContaminationOther (Specify)Suspected Industrial Chemical ContaminationTo:
Preservative Used <u>HCI HI</u> MPORTANT: First time sampledLast known sampling date Reason for submitting sample: SurveySuspected Petroleum Contamination Suspected Industrial Chemical ContaminationOther (Specify) <u>JUL 3 1989</u> CHAIN OF CUSTODY: From:To:To:TO: From:To:To:TO:TO: REMARKS:
MPORTANT:       First time sampledLast known sampling date         Reason for submitting sample:       Suspected Petroleum Contamination         Suspected Industrial Chemical Contamination       Other (Specify)         CHAIN OF CUSTODY:       From:
Reason for submitting sample: Survey
Suspected Industrial Chemical Contamination       Other (Specify)       JUL 3 1989         CHAIN OF CUSTODY:       From:
CHAIN OF CUSTODY: From:
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\square \square $
TRANS COUNTY - PLANT NO SAMPLING DATE COLLECTED CARD
TYPE STATION NO.
FIELD FIELD RESID. CHLORINE: FREE
Purgeable Halocarbons (EPA 601) Other Purgeables
Chloromethane <u>&gt;</u> trans-1,3-Dichloropropene <u>&lt;1</u> Benzene <u>1</u>
Bromomethane Trichloroethene Toluene
Dichlorodifluoromethane Ethylbenzene Zichlorodifluoromethane Ethylbenzene Zichlorodifluoromethane
/inyl choride 1,1,2-Trichloroethane Total Xylenes Chloroethane cis-1,3-Dichloropropene Total Purgeable Hydrocarbons
Aethylene chloride     2-Chloroethylvinylether       III       Schlorofluoromethane     Bromoform
Dichloroethene
,1-Dichloroethane
rans-1,2-Dichioroethene <u>V</u> Chlorobenzene <u>I</u> Acrylonitrile
Chloroform Carbon Disulfide Carbon Disulfide
2-Dichloroethane
,1,1-Trichloroethane
Bromodichioromethane
I,2-Dichloropropane
12-Dichlarubenzene 2
DATE ANALYZEP: 6-21-89 CEN-024362
Results reported in micrograms per (parts per attition / billion)
6/6 FG AR100583
DATE RECEIVED DATE REPORTED CHEMIST CHEMIST CHEMIST AB. NO 4M

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