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Diamond Shamrock

Law Department - Chemicals

OCT 9 RECD

September 26, 1980

Sandra S. Gardebring, Director
Enforcement Division, Region V
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, IL 60604

Dear Ms. Gardebring:

Enclosed is Diamond Shamrock Corporation's responses to Part II of your Supplemental Information Request dated August 8, 1980.

Very truly yours,

J. G. Smeraldi, Assistant
General Counsel/Chemicals

/njw

Enclosures

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

EXHIBIT 14

In Re: Diamond Shamrock Corporation
Painesville Township, Ohio
Response to Part II of Supplemental
Information Request

Operations at the Painesville Works facility that produced solid wastes include the following:

1.) Solvay process Soda Ash production, including Pure Calcium Products Production.

2.) Electric power generation by the combustion of coal.

3.) Electrolytic Chlorine and Caustic Production.

4.) Sodium Dichromate Production.

As a conservative estimate, 95+% of all solid wastes were generated by these operations. This does not preclude the possibility that other small amounts of solid wastes were generated from other facility operations from 1912 to works closure in 1976. However, as previously indicated in our September 12, 1980 information submission, our files and records do not go much beyond the decade of the 60's. Due to this, we lack information and data by which to respond completely to the questions in Part II.

Soda Ash and Pure Calcium Products production solid waste was composed primarily of calcium carbonate and silica (SiO_2). Other chemical characteristics include, but are not limited to, Calcium Chloride, Calcium Hydroxide, Sodium Chloride, Calcium Oxide (solid lime) and Ammonium Chloride. This waste was generated approximately from the years 1912 to 1976. No analyses of this waste are available in our records.

Solid waste from the burning of coal to produce electricity consisted of bottom cinders and ash and later light fly ash from electrostatic precipitators. The exact compositions of cinders and ash varied over the years with the type of coal burned. It is assumed that power generation was a part of the facility from the 1912-1920 area on up until facility closure in 1976. The light fly ash from precipitators probably dates from the late 1950's or early to mid 1960's.

A diaphragm cell Chlorine and Caustic plant was operated on the site from sometime during the decade of the 1930's until the early 1970's. Our records indicate that asbestos fibers, used to coat the diaphram cell, were washed from the cells and the slurry sent to our hydroretention basin for settling. We have no available records to indicate the amount of asbestos deposited nor the duration of disposal of this material in the retention pond.

The wastes from Sodium Dichromate include the residue ore generated from 1931 to 1972 when the plant was closed. Detailed information related to the solid wastes from this operation was included in the Part I information submission of September 12, 1980.

Other solid wastes on the Painesville site include the limited research quantities of chemicals disposed of in our one acre site. These materials were generated at Diamond locations, in addition to the Painesville site, and the type and quantities of materials have been provided in previous information request submissions dated May 7 and September 12, 1980. In addition, two reports were found dated November 25, 1968 and March 25, 1968 giving more details on Operating Procedure and exact locations of various chemicals disposed of in the one acre site. These are included in Exhibit #1.

Soda Ash production wastes were deposited in four waste lakes, #'s 1 thru 4 all of which we believe were built with clay dikes. The waste was sent to the waste lakes as a slurry, where the solids settled out and the remaining water was sent to the Grand River. Attached is a sketch (Exhibit #2) showing approximate locations of Waste Lakes #'s 1 thru 4. Cinders and fly ash from power generation could have been disposed of in any of the four waste lake areas. Exact disposal locations are not known, as records are not available. Attached is a sketch (Exhibit #2) showing the approximate location of settling ponds for the light fly ash. This material was slurried and sent to the ponds for settling. Bottom cinders were too heavy to pump and were hauled to disposal by truck and deposited in the lakes just inside the dikes. The light fly ash was slurried and settled in the Waste Lake #3 area and in the hydro-retention basin area.

Solid wastes from the Sodium Dichromate production were disposed of in the plant area and the east section of Waste Lake #2. Enclosed is Exhibit #3, an aerial photograph taken shortly after the chrome plant buildings were removed, probably 1972-73. This photograph was referenced in our response to question #6 in our September 12 information submission. This photo shows the locations of residue on this site. We have no records to indicate any solid wastes were hauled off our property site for disposal.

Attached see Exhibit #1 for additional records of one acre disposal site. Attached see Exhibit #4 for available records regarding asbestos disposal in the Hydro-retention basin.

To the best of the information, knowledge and belief of the undersigned, all statements herein contained are true and accurate and all documents submitted herewith are true and authentic.

DIAMOND SHAMROCK CORPORATION

By _____
Edward F. Foley, Jr.
Manager, Soda Products Div.
Research & Development
Chromium Chemicals

Dated _____

County of Cuyahoga)
) SS.
State of Ohio)

I, _____ a Notary Public in and for said county and state do hereby certify that on September _____, 1980, the aforesaid Edward F. Foley, Jr., known to me to be the person whose name is hereinabove subscribed, personally appeared before me and acknowledged that being aware of the contents of this Response to Information Request, he executed the same for Diamond Shamrock Corporation.

_____
NANCY JO WILLIAMS
Notary Public, State of Ohio - Cuya. Cty.
My Commission Expires Sept. 25, 1983

C101062

List of Exhibits

Exhibit #1	-	Reports dated March 25, 1968 and November 25, 1968 - One acre disposal site.
Exhibit #2	-	Sketch - approximate Locations Waste Lakes and Fly Ash Ponds
Exhibit #3	-	Aerial Photograph - Chrome Plant Site and Waste Lake #2, 1972-1973.
Exhibit #4	-	Records regarding asbestos disposal.

RDF

November 25, 1968

TO: Mr. S. G. Last

FROM: A. V. Grasulis

SUBJECT: Burial of Waste Material.

The attached report by A. J. Rosso gives the details of Waste Material Burials which took place in 1968. The procedure for carrying out the operation was satisfactory to all concerned.

It appears that there will be sufficient room to continue the operation through 1969. After that, we will have to provide new arrangements.

A. V. Grasulis

A. V. Grasulis

AVG:so
Attach.

cc: Mr. J. J. Browne
Mr. H. E. Case
Mr. D. E. Herrington
Mr. J. H. Shaffer - Mr. W. C. Kim
Mr. W. R. Taylor - Mr. R. D. Hall

POLLUTION FILES
DEC 16 50

C100867

November 19, 1968

TO: A. V. Grasulis

FROM: A. J. Rosso

SUBJECT: Burial of Waste Material at
Restricted Disposal Area - East of Coke Plant.

During 1968, waste material from our Research Labs-Concord, Semi-Works - Ashtabula and Decrosat Complex - Charlon was buried at the restricted chemical waste disposal area, east of the Coke Plant. The material was disposed of without incident on the following dates:

April 23, 24 and 25

July 16, 18 and 19

November 4, 5, 6, 7 and 8

A log of the material buried during these dates and past recordings are listed on the attached data sheets along with other pertinent information.

A total of 826 fifty-five gallon steel drums and 109 five gallon steel drums were buried in 1968. This consumed 8,600 square feet or 21.5% of the entire restricted disposal area. Based on these numerical figures, there is approximately 40% of the disposal area remaining for future use or 15-20 months duration based on 1968 consumption. This can be seen on the attached plot plan.

Extreme care was exercised throughout the burial operations, adhering to the operating procedures listed by Mr. S. O. Lant in his report of March 15, 1968.

AJRosso

A. J. Rosso

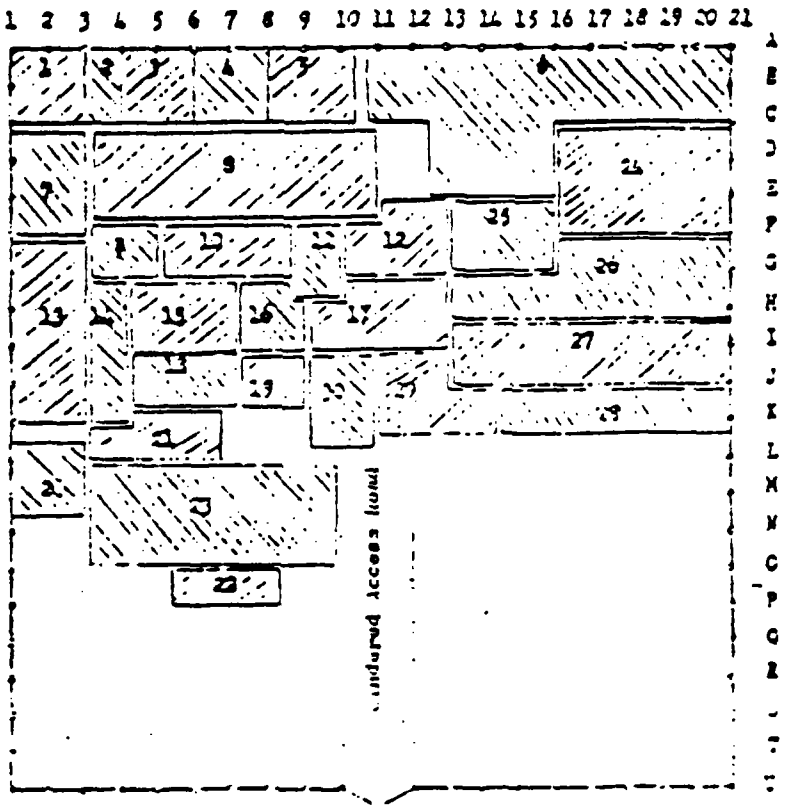
AJRosso
Attach.

C100868

HAZARDOUS WASTE DISPOSAL AREA EAST OF COKE PLANT

The shaded areas below shows the location and area which has been used for the burial of hazardous waste from the Research Center, Ashtabula Semi-works, and Chemicon.

Original area within fence ——— 40,000 square feet (200'x200')
Area between fence posts ——— 10 feet
An area of 20'x20' ——— 400 sq.ft. or 1% of fenced in area



[illegible] of Material Buried at
[illegible] Waste Disposal Area - From [illegible]-Concord.

Date	Number of Drums and Drum Size	Area #	Material Buried	Hazard - Remarks
4/2[illegible]/68 4/2[illegible]/68 4/2[illegible]/68	65 - 55 Gal.	23	Treated potassium hydroxide (KOH) plus potassium fluoride (KF) with calcium chloride ($CaCl_2$) to form calcium fluoride (CaF_2).	Only if exposed to high [illegible] concentrations.
	52 - 55 Gal. 51 - 5 Gal.	23	Iso phtallo nitrile (IFN) and Daconil 2787 solid material.	Fire hazard - skin and eye irritant.
	29 - 55 Gal. 22 - 5 Gal.	23	Dion Polymercaptan (DPM) waste - solid material - filter papers and salt suspension.	Skin irritant.
	12 - 55 Gal.	23	Acid chrome wastes - Cr^{+3} plus Vitamin K.	Skin irritant.
	16 - 5 Gal.	23	Polyvinyl Fluoride (PVF).	No hazard.
	3 - 55 Gal.	23	Polyvinyl Chloride (PVC).	No hazard.
	22 - 55 Gal.	23	Chloro - organics plus non-burnable organic solvents (solid cyanide polymers, organic arsenic compounds).	Skin and eye irritant - bio toxic.

Totals: 183 Fifty-five gal. steel drums
89 Five gal. steel drums

C100870

[illegible] Material [illegible] at
[illegible] Waste Disposal Area - From Research-Concord.

Date	Number of Drums and Drum Size	Area #	Material Buried	[illegible] - Remarks
7/16/68	35 - 55 Gal.	24	Treated KCH	Can cause skin and eye irritation.
	8 - 55 Gal.	24	IPN and DACONIL 2787.	IPN is a non-toxic [illegible]. 2787 can cause skin and eye irritation.
7/18/68	43 - 55 Gal.	24	IPN, DACONIL 2787 and carbon catalyst.	
7/19/68	20 - 5 Gal. Pails	25	DMF waste.	
	3 - 55 Gal. Drums	25	Chromium Vitamin K waste.	Skin irritant,
	5 - 55 Gal.	25	Safire waste	
	2 - 55 Gal.	25	P-chlorophenol	
	4 - 55 Gal.	25	PTF & color pigment waste.	Not hazardous.
	5 - 55 Gal.	25	Mixed analytical samples.	
	1 - 55 Gal.	25	DAC-469	
	5 - 55 Gal.	25	Trichlorobenzene, DMF, & other hydrocarbons.	
	2 - 55 Gal.	25	Acid chromium waste.	
	13 - 55 Gal.	25	IPN and DACONIL 2787.	As noted above.
	1 - 55 Gal.	25	P-diamine-4, Vanadia, & Alumina catalyst.	
	1 - 55 Gal.	25	New polyglycol, DACTHAL W-50, PolymentApplic. R900 Tagular alumina, alumina & Vanadia catalyst.	
	1-- 55 Gal.	25	Polyacetal, DACAGEN, butylcatechol, Surfactants, and Ionol antioxidant.	
	1 - 55 Gal.	25	NH_4, sodium arsenite, antimony oxide, and Sarcocan acid.	
	1 - 55 Gal.	25	DDT, aluminum stearate.	
	1 - 55 Gal.	25	P - diamine - 4.	
	1 - 55 Gal.	25	Zinc chloride catalyst & M-diamine-4.	
	1 - 55 Gal.	25	Polyglycol.	
	1 - 55 Gal.	25	Isophthalic acid.	

C100871

Log Material [illegible] at
[illegible] ated the [illegible] posal Area.

Date	Firm Where Number of Drums and Drum Size	Area #	Material Buried	[illegible]
11/4/68	Research			
	9 - 55 Gal.	26	Organic solvents.	Liquid, skin irritant.
	2 - 55 Gal.		Analytical samples.	Various samples - all [illegible] & placed in steel [illegible] gal. [illegible].
	2 - 55 Gal.		Arsonates	Liquids, solids - hazardous [illegible] taken internally.
	2 - 55 Gal.		CrO_3 + Acid	Reduced chromic acid compound - water soluble - slight skin [illegible]
	2 - 55 Gal.		Muriatic Acid	Liquid, very diluted - slight skin and eye irritant.
	3 - 55 Gal.		Dion Poly Mercaptan (DPM) waste.	See #23.
	21 - 55 Gal.		IPM and 2707 waste	See #2.
	3 - 55 Gal.		Treated Potassium Hydroxide (KOH)	See #23.
	Ashtabula			
	41 - 55 Gal.	26	Water Repellent waste	See #17.
	38 - 55 Gal.		Dion Poly Mercaptan (DPM) waste	See #23.
11/5/68	Research			
	32 - 55 Gal.	27	Treated Potassium Hydroxide (KOH)	See #23.
	2 - 55 Gal.		Vernolite - solvent	Liquid - skin irritant.
	15 - 55 Gal.		CrO_3 + Acid	See above.
	9 - 55 Gal.		Poly Vinyl Chloride (PVC) Resin	Solid - non-hazardous.
	29 - 55 Gal.		Dion Poly Mercaptan (DPM)	See #23.
	Ashtabula			
	3 - 55 Gal.	27	DPM waste	See #23.
	29 - 55 Gal.		Chlorinated Polyethylene	Extremely viscous material - non-hazardous.
	33 - 55 Gal.		Dichloroparaxylene (P-Q-2-O)	Chlorinated paraxylenes - solids - slight skin irritant
	1 - 55 Gal.		Chromic Acetate	Reduced chromic acid compound - solid - skin irritant.
	2 - 55 Gal.		Hexachlorobutadiene	See #7.
	1 - 55 Gal.		3,4 Dichloropropionanilide (DCA - 3,4)	Solid - skin and eye irritant.
	1 - 55 Gal.		Chlorinated Nonene (Diablo 700X)	Viscous liquid - non-hazardous.
	2 - 55 Gal.		Disodium Methyl Arsenate (DSMA)	Solid - skin and eye irritant - toxic.

C100872

Log of Material Buried at
Restricted Waste Disposal Area.

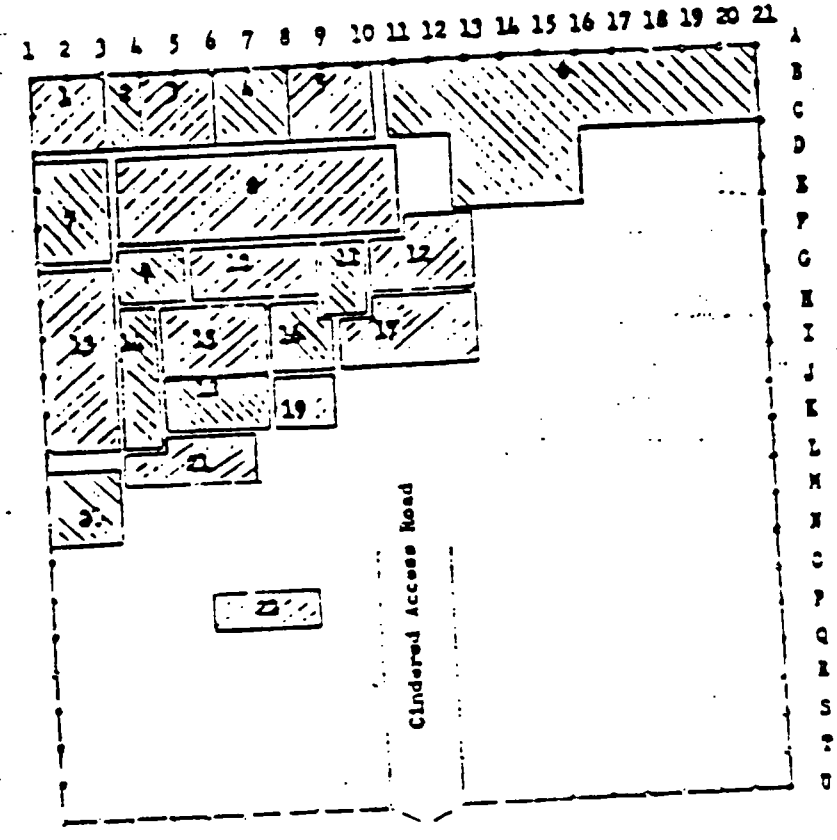
Date	From Where Number of Drums and Drum Size	Area #	Material Buried	Hazard - Remarks
11/6/68	Research			
	9 - 55 Gal.	28	Treated KCH	See #23.
	1 - 55 Gal.		Muriatic Acid	See #26.
	7 - 55 Gal.		DPM waste	See #23.
	1 - 55 Gal.		Analytical samples	See #26.
	2 - 55 Gal.		Poly Vinyl Fluoride (PVF)	Solid - no hazard.
	Ashtabula			
	5- 55 Gal.	28	DPM waste	See #26.
	15 - 55 Gal.		HCBD bottoms	See #7.
	26 - 55 Gal.		P - O - 2-O	See #27.
	20 - 55 Gal.		Purfon	Straight chain polymer - viscous liquid - non-hazardous.
	2 - 55 Gal.		Lecithin	Sugar base solid - non-hazardous.
	3 - 55 Gal.		DSMA	See #27.
	2 - 55 Gal.		DCA - 34	See #27.
11/7/68	Ashtabula			
	42 - 55 Gal.	29	DPM waste	See #26.
	21 - 55 Gal.		P - O - 2 - O	See #27.
	5 - 55 Gal.		HCBD bottoms	See #7.
	4 - 55 Gal.		DCA - 34	See #27.
11/8/68	Ashtabula			
	30 - 55 Gal.	30	DPM waste	See #26.
	8 - 55 Gal.		HCBD bottoms	See #7.
	7 - 55 Gal.		P - O - 2 - O	See #27.
	7 - 55 Gal.		DCA - 34	See #27.
	1 - 55 Gal.		Lecithin	See #28.
	1 - 55 Gal.		Delvet 65	Emulsified chlorowax 70 - viscous liquid - skin irritant.
	4 - 55 Gal.		Diable 700X	See #27.
	2 - 55 Gal.		Water Repellent waste	See #26.

C100873

HAZARDOUS WASTE DISPOSAL AREA EAST OF COKE PLANT

The shaded areas below show the location and area which has been used for the burial of hazardous waste from the Research Center, Ashtabula Semi-works, and Chardon.

Original area within fence ——— 40,000 square feet (200'x200')
Area between fence posts ——— 10 feet
Is area of 20'x20' ——— 400 sq.ft. or 1% of fenced in area



C100878

[illegible] at
[illegible] posal Area.

Date	From [illegible]	Area #	← Material Buried →	Remarks
12/[illegible]	Ashtabula	1	15 Drums of Dion Polysulfide	A solid material - very odorous - hydrogen sulfide (H_2S) may evolve.
2/3/66	Research	2	250# Waste IPN and Deconil 2787	IPN - a solid material, water soluble, non-toxic (Iso phthalic nitrile). 2787 - a fine fluffy material, water soluble, can cause eye irritation & skin rash - should be considered hazardous.
2/10/66	Research		275# Scrap PVF Resin	PVF - a solid material non-toxic but at high temperatures (approx. 850°F) can decompose & evolve fluorinated compounds.
2/17/65 2/21/67	Research Research	3	1800# Waste IPN and Deconil 2787) 800# Waste IPN and 2787)	Same as above.
2/22/67 2/23/67 2/21/67	Research and Chardon	4	Paraffins & waxes, Caustics & Phenol Caustics Organic Solvents, Alcohols, Metholates and misc. unknown.	Caustics & Phenol Caustics can cause burns & eye irritation. Organic solvents can cause skin irritation.
6/24/65	Ashtabula	5	21 Drums of Epiton Waste	Sulfonated phenol formaldehyde - can cause skin irritations (such as burns) and eye irritation.
Jan.-Feb. March May 1965	Research	6	1350# misc. small samples, 100# Polyacetyl wastes, 20# Ethylene Dichloride, 50# Polythi, 50# Methyl Methacrylate, 20# Dimethyl Formamide, 50# p-1-O-1, 250# Diisocyanate waste.	These are small analytical samples of various toxic organic compounds - they can cause skin and eye irritations as [illegible] bio-toxicity characteristics.
9/10/65	Ashtabula	7	63 Drums of Epiton waste, HCBD, HCBD Still bottoms and related materials.	HCBD - Hexachlorobutadiene - a chlorinated organic solid and semi-solid material. Should be treated as a hazardous compound - can cause skin & eye irritations, can decompose slowly and release HCl. Related material should be treated the same as HCBD.
4-5,6, 7, 1967	Research	8	198 Drums Deconil 2787 and related material.	Same as #2 above.

C100879

[illegible] at
[illegible] Area.

Date	[illegible]	Area #	← Material Buried →	Remarks
12/ 2/64	Ashtabula	1	15 Drums of Dion Polysulfide	A solid material - very odorous - hydrogen sulfide (H_2S) may evolve.
2/[illegible]/65	Research	2	250# Waste IPN and Daconil 2787	IPN - a solid material, water soluble, non-toxic (Isophthalic nitrile). 2787 - a fine fluffy material, water soluble, can cause eye irritation & skin rash - should be considered hazardous.
2/10/[illegible]	Research		275# Scrap PVF Resin	PVF - a solid material non-toxic but at high temperatures (approx. 850°F.) can decompose & evolve fluorinated compounds.
2/[illegible]/[illegible] 2/[illegible]/67	Research Research	3	1000# Waste IPN and Daconil 2787) 800# Waste IPN and 2787)	Same as above.
2/22/67 2/23/67 2/24/67	Research and Chardon	4	Paraffins & waxes, Caustics & Phenol Caustics Organic Solvents, Alcohols, Metholates and misc. unknown.	Caustics & Phenol Caustics can cause burns & eye irritation. Organic solvents can cause skin irritation.
8/24/65	Ashtabula	5	21 Drums of Epitan Waste	Sulfonated phenol formaldehyde - can cause skin irritations (such as burns) and eye irritation.
Jan.-Feb. March May 1965	Research	6	1350# misc. small samples, 100# Polyacetyl wastes, 20# Ethylene Dichloride, 50# Polythl, 50# Methyl Methacrylate, 20# Dimethyl Formamide, 50# p-1-O-1, 250# Diisocyanate waste.	These are small analytical samples of various toxic organic compounds - they can cause skin and eye irritations and [illegible] bio-toxicity characteristics.
9/10/65	Ashtabula	7	63 Drums of Epitan waste, HCBD, HCBD Still bottoms and related materials.	HCBD - Hexachlorobutadiene - a chlorinated organic solid and semi-solid material. Should be treated as a hazardous compound - can cause skin & eye irritations, can decomp slowly and release HCl. Related material should be treated the same as HCBD.
4-5,6, 7, 1967	Research	8	198 Drums Daconil 2787 and related material.	Same as #2 above.

C100880

[illegible] at
Ren[illegible] [illegible]posal Area.

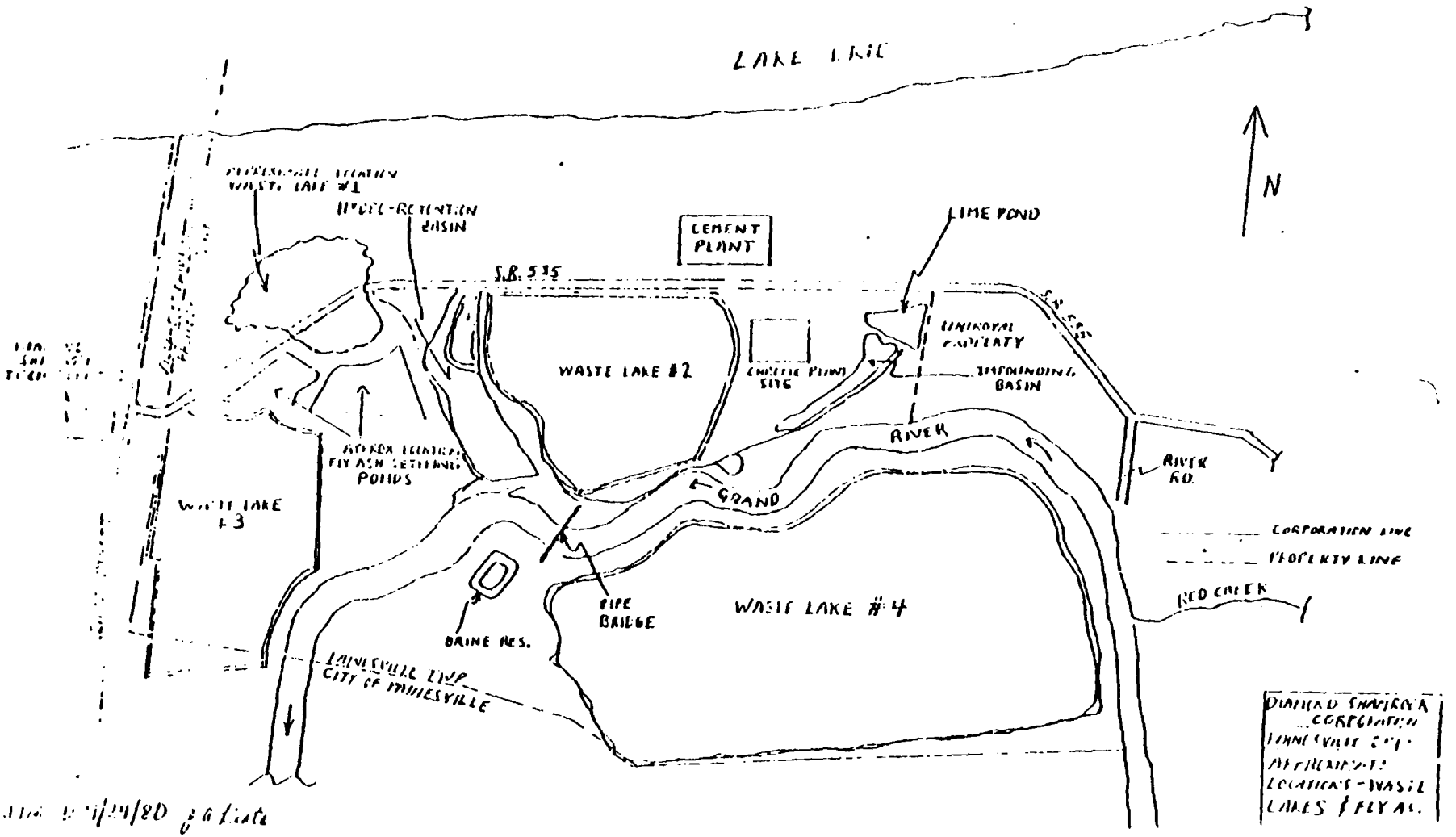
Date	From [illegible]	Area #	← Material Buried →	Remarks
5/25/6[illegible]	Chardon	9	14 Drums - 3% Chromic Acid in water and weak caustic solution.	The same precautions should be taken with these compounds as with any other acid or alkali.
7-5,6, 7 1967	Research and Chardon	10	36 Drums of 2787, 3 drums of Polymercaptons, 23 drums of misc. material from Research "B" building.	2787 - same as #2. Polymercaptons - a hydrocarbon polymer with hydroxyl (OH^-) groups attached to it. The compounds are odorous and the same precautions should be taken as with other acids or alkalies.
7/1[illegible]/67	Ashtabula	11	14 Drums of HCBD Still Bottoms	Same as #7
11/1/67	Research	12	Daconil 2787	Same as #2.
12/21/66	Research	13	PVC, Polymercaptons, Chlorinated Solvents.	PVC - Inert, no handling problem. Polymercaptons - see #10 above. Chlorinated Solvents - may cause skin irritation - should not directly inhaled - similar in effect to Carbon Tetrachloride.
10/20/67	Research	14	Sludge material from Research "B" Bldg. sump - mostly 2787, Polymercaptons and unknown conglomeration of materials.	Same as #2 and #10.
11/1/67	Research	15	Daconil 2787, Polymercaptons, misc. of unknown materials.	Same as #2 and #10.
11/3/67	Ashtabula	16	24 Drums of HCBD Still Bottoms	Same as #7.

C100881

ed at
Disposal Area.

Date	Fr[illegible]	Area #	Material Buried	Remarks
12/6/[illegible]	Ashtabula	17	Water Repellent	A liquid material consisting principally of [illegible] aluminum stearate and chrome complexes. May cause skin irritations.
12/8/[illegible]	Ashtabula	18	Water Repellent	
12/7/[illegible]	Research	19	Deconi 2787, Polymercaptans, misc. of unknown materials.	Same as #2 and #10.
12/21/66	Ashtabula	20	20 Drums of MCBD Still Bottoms	Same as #7.
12/1[illegible]/67	Research	21	42 Drums of Methyl Chloroform with acetylates.	Organic Solvent - can cause skin and eye irritation.
12/14/67	Ashtabula	22	78 Drums of MCBD Still Bottoms, scrap Diablo, Water Repellent, DPM, chlorinated Xylene - liquid and semi-solid.	MCBD - same as #7. Diablo - similar to CUG 70 - non-toxic material. DPM - dipa polymercaptan - same characteristics as #10, it is stable and non-corrosive. Chlorinated xylenes - liquid and semi-solid materials - can cause skin irritations and can slowly decompose and release HCl.

C1008882


LAKE ERIE
N
WASTE LAKE #1
BASIN
CEMENT PLANT
LIME POND
S.R. 535
WASTE LAKE #2
CHROME PLANT SITE
IMPOUNDING BASIN
RIVER
RIVER RD.
GRAND
POINDS
WASTE LAKE #3
CORPORATION LINE
PROPERTY LINE
RED CREEK
PIPE BRIDGE
WASTE LAKE #4
BRINE RES.
LAINESVILLE TWP
CITY OF LAINESVILLE
DIAMOND SHAMROCK CORPORATION
LOCATIONS - WASTE LAKES & FLY AS.

C101000

C101C81

[illegible] "National Emission Standards [illegible] for the Painesville [illegible] site.

[illegible]

[illegible] for the National Emission Standard for asbestos [illegible] of [illegible] in Section 61.22 (c)(3). As such we have [illegible] to Section 61.22 (c), which applies to [illegible] of [illegible] waste disposal site operated by sources covered under Section 61.22 (e) [illegible] waste material produced by such sources was deposited. The following standards must be met:

1. No visible emissions to the outside air from an inactive disposal site.

2. Warning signs are to be posted according to Section 61.22 (1)(2) [illegible] asbestos waste disposal site. Signs are not required, if in disposing of the asbestos-containing waste material one of the following approaches is utilized:

   A. Six inches of compacted non-asbestos-containing material is used for cover and vegetation grown and maintained to prevent exposure of the waste material.

   B. Two feet of compacted non-asbestos-containing material is used for cover and maintained to prevent the exposure of the waste material.

   C. A determination is made by the Administrator that a natural barrier exists that will deter access by the general public.

3. The perimeter of the site shall be fenced in a manner adequate to deter access by the general public. However, fencing is not required, if 2A or 2B or 2C [illegible] is [illegible].

It appears that, if 2C above can be obtained, our Painesville retention basin will be in compliance with the regulations without any physical changes being required. I am in the process of completing part I.D. of a Compliance Status Information report for the U.S. EPA Air Enforcement Branch relating to our asbestos disposal operations. A required part of the report is a description of our [illegible] disposal sites, which will be reviewed by the Administrator to determine our compliance with the regulations. At that time we will be able to determine, if further action in this matter is necessary.

Will

WILLIAM [illegible]

[illegible]

cc: [illegible]

[illegible]

C101082

[illegible]

SEP [illegible] 1978

[illegible]
[illegible] Control
[illegible]

[illegible]:

[illegible] recently received the [illegible] information [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] compliance with the regulation [illegible] be [illegible] [illegible].

[illegible] concerning the requirements of the Clean [illegible] or 40 C.F.R. [illegible] Christian at (312) [illegible]. Thank you for your [illegible].

Very truly yours,

David Kee, Chief
Air Enforcement Branch
Enforcement Division

cc: Dick [illegible], Chief
Office of Air Pollution Control

0101083

[illegible]

File No. [illegible]

[illegible]

[illegible]

As of your memo dated July 14, 1976 on the above subject matter, the attached data is submitted.

Only Section C was completed. Section D applies to the maintenance of an inactive landfill site and should be completed when the Painesville Plant is phased out. This information was submitted via telephone to me by Paul Dugas.

A. J. Pesce

AJ:int

Attach.

cc: R. M. Parsons
R. A. [illegible]
T. F. [illegible]
F. J. [illegible]
S. G. [illegible]

C101084

LANDFILL COVERED

C101085

DIAMOND SHAMROCK CHEMICAL COMPANY

A Unit of Diamond Shamrock Corporation

1300 Union Commerce Building Cleveland, Ohio 44115 Telephone 621-8100

October 11, 1968

POLLUTION FILES
PLANT
SUBJECT

Mr. O. M. Hall
Engineer Secretary
Ohio Water Pollution Control Board
Department of Health
450 East Town Street
P. O. Box 118
Columbus, Ohio 43216

Dear Al:

The completed Renewal Application for Permit to Discharge Sewage, Industrial Wastes, or Other Wastes into Waters of the State is hereby submitted for review and approval.

Details concerning specific conditions attached to our previous permit are given in the Supplemental Information Statement attached to the Renewal Application.

Sincerely yours,

DIAMOND SHAMROCK CHEMICAL COMPANY

Richard D. Hall, P.E.
Environmental Control Engineer

RDH:vg

bcc: Messrs. H. B. Clark
S. G. Lant
M. O. Kirp
Steve Puschaver
F. H. Rockwell
W. R. Taylor

POLLUTION FILES
PLANT
SUBJECT

EXHIBIT 15

(Do Not Write in This Space)

Application No.

Date Received

(Do Not Write in This Space)

Permit No.

Date of Permit Issue

WATER POLLUTION CONTROL BOARD
DEPARTMENT OF HEALTH
STATE OF OHIO

RENEWAL APPLICATION FOR PERMIT TO DISCHARGE SEWAGE, INDUSTRIAL WASTES, OR OTHER WASTES INTO WATERS OF THE STATE

Please read carefully instructions on reverse side of this application before filling out.

1. Name DIAMOND SHAMROCK CHEMICAL COMPANY, A Unit of DIAMOND SHAMROCK CORPORATION
2. Location Painesville
3. Type of Establishment (if not a political subdivision) CHEMICAL MANUFACTURING PLANT
4. Type of Discharge Industrial Wastes
5. Body of Water Receiving Discharge Grand River Principally; Lake Erie in Part
   (a) Most large receiving tributary Lake Erie
6. Is Discharge Treated? — Yes X No Part is treated; part is not; see attachment to previous application
7. Attach supplemental information on compliance with renewal conditions stated in letter accompanying previous permit (No. 7669)

Any supplemental information submitted in connection with this application will be treated as confidential by the Board.

Submission of this application does not constitute a waiver by the applicant of any rights or exceptions provided by law.

In accordance with the provisions of the Water Pollution Control Act, Sections 6111.01 to 6111.08 Revised Code of Ohio, and with the rules and regulations adopted by the Water Pollution Control Board in pursuance thereof, application hereby is made for a permit to discharge into the waters of the state sewage, industrial wastes, or other wastes, as described above, and in supplemental information herein attached, all of which is made a part of this application.

Signature of authorized official F. H. Rockwell

Title Director of Engineering

Post Office Address 300 Union Commerce Bldg.

Cleveland Ohio 44115

VERIFICATION

F. H. Rockwell, being first duly sworn, says that he is the officer or person duly authorized to execute the foregoing application, and that the statements made and answers given therein, written or printed, are true as he verily believes.

Signature of Applicant F. H. Rockwell

Sworn to or subscribed in my presence this 11th day of October 1969

at Cleveland County of Cuyahoga And State of Ohio

Signature of Officer

Official Title MARY J. DAVIS
Notary Public, Cuyahoga County
My Commission Expires Oct. 17, 1971

3672.34

C202326

SUPPLEMENTAL INFORMATION
For
Waste Disposal Permit Renewal Application

Diamond Shamrock Chemical Company
A Unit of Diamond Shamrock Corporation
Fairport, Ohio
October, 1968

The renewal permit for the discharge of industrial wastes and sanitary sewage from the Painesville Plant of the Diamond Shamrock Chemical Company, a unit of Diamond Shamrock Corporation, No. 669.15, issued April 15, 1968 and expiring November 1, 1968, had eight conditions attached. The status of compliance to these conditions is summarized in the following paragraphs numbered to correspond with the letter accompanying the renewal permit.

1. Provide satisfactory maintenance and operation of existing facilities for the treatment and disposal of industrial wastes in accordance with approved Water Quality Standards.

   The existing facilities for the treatment and disposal of industrial wastes have been satisfactorily operated and maintained, and in accordance with approved Water Quality Standards.

2. Submit to the Division of Engineering, at regular monthly intervals, reports to include information regarding flow volumes and pertinent analytical data on the industrial waste discharges.

   Reports setting forth information regarding flow volumes and pertinent analytical data on the industrial waste discharges have been submitted to the Division of Engineering, Ohio Department of Health, at regular monthly intervals.

C202327

3. Complete construction of the facilities to convey the acid wastes from the HCl - Chlorowax area to the Hydrogate basin.

The construction of facilities to convey acid wastes from the HCl - Chlorowax area to the Hydrogate basin was completed during and placed in operation during August, 1968. (See monthly report dated 8/29/68)

4. Continue the investigation with respect to increasing the efficiency of the chrome wastewater treatment facilities.

The new chrome plant wastewater treatment facilities were put on stream during December, 1967. Between December, 1967 and June, 1968, our main efforts involved "debugging" the new sulfuric acid - SO_2 treatment facility's control system. Since June 24, 1968, the chrome plant's wastewaters have been treated with spent pickle liquor receive from the steel mills. Occasional interruptions in the spent pickle liquor supply, plus plant upsets, have resulted in some flow of untreated wastewaters being discharged into Waste Lake #4. In order to control and reduce the effect of these effluents in the future, a warning system has been activated so that plant personnel can switch to the sulfuric acid - SO_2 treatment system, or increase the spent pickle liquor flow. Additional measures will be taken to insure a satisfactory effluent, as the need becomes apparent.

5. Continue the study of methods to improve the removal of suspended solids in the Waste Lake effluent and submit a report regarding findings and accomplishments.

During the past year, several steps have been taken in an effort to

improve the clarity of waste lake A's discharge, and since July, 1968, we have controlled the discharge of these wastewaters to Grand River. These steps include the installation of a floating wave-breaking barrier and rip-rap along the dike, and flow-measuring weirs and shut-off gates on the outlets. Plant personnel inspect the effluent daily and operate the shut-off gates. The shut-off gates are closed when the effluent has a high turbidity and are opened when the wastewaters are clear.

Present work consists of re-evaluating our sampling procedures. Our present procedure is to take daily grab samples which are composited to weekly samples prior to being analysed. With the advent of "controlled discharge", we believe this procedure does not adequately reflect actual conditions. We are, therefore, studying the ways and means of installing continuous samplers. This work should be completed in the near future. Our next step will be the over-all evaluation of the performances of the new installations and procedures. This phase should be completed during the next permit year.

6. <u>Investigate means for the satisfactory disposal of the ammonia still wastes from the coking operations.</u>

Plant personnel have contacted representatives of the City of Painesville and their consultants about the possibility of treating these wastewaters in Painesville's Wastewater Treatment Plant. We have been informed (verbally) that Painesville's new Wastewater Treatment Plant will be able to satisfactorily handle this waste stream. It is our prime hope that this procedure will provide a

satisfactory solution to this problem. We will continue to work closely with the City of Painesville on its implementation.

7. Promptly report to the Division of Engineering the occurrence and cause of any accidental or intermittent discharges of wastes which may have a deleterious effect on the receiving stream.

As outlined in previous applications, slag discharges are not experienced in the normal course of company operations. All major processes are on a continuous rather than a batch basis, so the normal waste flow is relatively constant in concentration and volume. The possibility of equipment failure, such as tank ruptures, pipe breaks, and the like, is minimized by regular and frequent inspection by both plant and insurance company personnel. Raw and in-process materials whose accidental loss by reason of equipment failure or damage are provided with secondary protection in the form of dikes, retaining pits, or pumps.

In the event of emergency or accidental discharge of concentrated wastes, the following procedure has been instituted: The responsible supervisor will immediately report the discharge to the Works Manager. If the discharge is one which will present a hazard to establishments in the vicinity, the Works Manager will notify the State Department of Health and others affected in the vicinity of the discharge and the characteristics of the material. He will also recommend (in cooperation with the Department of Health) immediate steps to avoid damage which might result from the use of the polluted water. After the immediate danger is past, the cause of the discharge will be determined and appropriate steps taken to prevent recurrence.

8. Submit to the Division of Engineering information pertaining to any plant expansion or process changes which may affect the character of the industrial waste discharges, together with a proposal for providing controls for such discharges so that there will be no deleterious effect on the receiving stream.

There has not been any plant expansions and/or changes in process which may significantly affect the industrial wastes treatment and disposal problems. When such plant expansions and/or changes in process develop, information concerning the same, together with our proposal for adjustments or improvement to the industrial wastes disposal facilities will be submitted.

RDH:vg

10/11/68

C202331

DIAMOND SHAMROCK CHEMICAL COMPANY

A Unit of Diamond Shamrock Corporation

300 Union Commerce Building, Cleveland, Ohio 44115 Telephone 821-6100

October 6, 1969

Mr. G. A. Hall, Engineer Secretary
Ohio Water Pollution Control Board
Department of Health
P. O. Box 118
Columbus, Ohio 43216

Dear Al:

The completed "Renewal Application for Permit to Discharge Sewage, Industrial Wastes, or Other Wastes into Waters of the State" is hereby submitted for review and approval.

Details concerning specific conditions attached to our previous permit are given in the Supplemental Information Statement attached to the Renewal Application.

Sincerely yours,

DIAMOND SHAMROCK CHEMICAL COMPANY

Richard D. Hall

Richard D. Hall, P.E.
Environmental Control Engineer

RDH:mk

bcc: Mr. H. B. Clark - w/att
Mr. S. G. Lant - Painesville - w/att
Mr. R. H. Parsons - Painesville - "
Mr. C. R. Powell - w/att
Mr. R. C. Sutter - "
Mr. W. R. Taylor - "

POLLUTION FILES
PLANT 7505 C-16
SUBJECT

EXHIBIT 16

(Do Not Write in This Space)

Application No. [illegible]

Date Received [illegible]

(Do Not Write in This Space)

Permit No. [illegible]

Date of Board Action [illegible]

WATER POLLUTION CONTROL BOARD
DEPARTMENT OF HEALTH
STATE OF OHIO

RENEWAL APPLICATION FOR PERMIT TO DISCHARGE SEWAGE, INDUSTRIAL WASTES, OR OTHER WASTES INTO WATERS OF THE STATE

Please read carefully instructions on reverse side of this application before filling out.

1. Name DIAMOND SHAMROCK CHEMICAL COMPANY, A Unit of DIAMOND SHAMROCK CORPORATION
2. Location Fairport
3. Type of Establishment (If not a political subdivision) CHEMICAL MANUFACTURING PLANT
4. Type of Discharge Industrial Wastes
5. Body of Water Receiving Discharge Grand River Prinicpally: Lake Erie in Part
   (a) Next larger receiving tributary Lake Erie
6. Is Discharge Treated? --- Yes X No Part is treated, part is not; see attachment to previous application
7. Attach supplemental information on compliance with renewal conditions stated in letter accompanying previous permit (No. 669.16

Any supplemental information submitted in connection with this application will be treated as confidential by the Board. Submission of this application does not constitute a waiver by the applicant of any rights or exemptions provided by law.

In accordance with the provisions of the Water Pollution Control Act, Sections 6111.01 to 6111.08 Revised Code of Ohio, and with the rules and regulations adopted by the Water Pollution Control Board in pursuance thereto, application hereby is made for a permit to discharge into the waters of the state sewage, industrial wastes, or other wastes, as described above, and in supplemental information hereto attached, all of which is made a part of this application.

Signature of authorized official [signature]

Title Manager of Engineering

Post Office Address 300 Union Commerce Building

Cleveland, Ohio 44115

VERIFICATION

W. R. Taylor, being first duly sworn, says that he is the officer or person duly authorized to execute the foregoing application, and that the statements made and answers given therein, written or printed, are true as he verily believes.

Signature of Applicant [signature]

Sworn to and subscribed in my presence this [illegible] day of [illegible] 1969, at Cleveland County of Cuyahoga And State of Ohio

Signature of Officer [signature]

Official Title Notary Public

BENNIE S. HARGETT
My Commission Expires
1-25-72

3472.34

C202333

STAFF MEMORIAL INFORMATION
For
Waste Disposal Permit Renewal Application
Diamond Shamrock Chemical Company
A Unit of Diamond Shamrock Corporation
Painesville, Ohio
October, 1969

The renewal permit for the discharge of industrial wastes and sanitary sewage from the Painesville Works of the Diamond Shamrock Chemical Company, a unit of Diamond Shamrock Corporation, No. 669.16, issued March 12, 1969, and expiring November 1, 1969, had five conditions attached. The status of compliance to these conditions is summarized in the following paragraphs, numbered to correspond with the letter accompanying the renewed permit.

1. <u>Provide satisfactory maintenance and operation of existing facilities for the treatment and disposal of industrial wastes in accordance with approved Water Quality Standards.</u>

The existing facilities for the treatment and disposal of industrial wastes have been satisfactorily operated and maintained, and in accordance with approved Water Quality Standards.

a. During the present permit year:

(1). The chrome wastewater treatment plant force main for conducting treated chrome plant wastewaters to Waste Lake #4 broke twice and was promptly repaired. During this period, the chrome plant wastewaters were contained in the chrome ore residue drainage pond and not discharged to Grand River. In July, 1969, we were able to pump the chrome ore residue drainage pond dry. The pond is still used as a holding pond or drainage pond in the event of treatment station failure, or as a collection point during periods of leaching of waste ore piles caused by heavy rainfalls. The chrome contaminated waters contained in this pond were pumped through the chrome wastewater treatment plant and treated with the chrome plant's wastewaters;

C202334

(2). A new 16" line has been constructed around Waste Lake #4 so that the soda ash plant's process wastewaters (blow-off liquor) may be discharged into the waste lake on the Elm Street side. This action will extend the life of the current waste lake capacity by minimizing the effect of solids buildup. Sufficient quantities of blow-off are still being discharged into the waste lake at the north-west end for neutralizing the spent pickle liquor and the treated chrome plant wastewaters;

b. At the present time:

(1). A new settling basin, approximately 400 feet x 1300 feet x 10 feet deep, at a cost of $39,000 is being constructed on top of a portion of abandoned Waste Lake #2 to provide additional capacity for the fly ash contaminated wastewaters from the power plant. The new fly ash settling basin will have an expected life of 4 to 5 years. The clarified effluent will flow into the Grand River. Removal of these solids from the inflow to the Hydrogate Basin should extend the Hydrogate Basin's effective life between clean-outs;

(2). Negotiations are being finalized with a contractor for removing the settled solids from the Hydrogate Basin. The basin is rapidly becoming filled with settled solids. These solids will be pumped onto another area of abandoned Waste Lake #3, thereby renewing the settling capacity of the Hydrogate Basin. Drainage waters will flow back to the Hydrogate Basin for clarification prior to discharge. Estimated costs of this operation is $75,000 to $100,000. We expect to begin dredging during the fourth quarter of 1969; and,

(3). Negotiations with the City of Painesville and their consultants, are still underway with respect to the discharge of the ammonia still wastes from the coking operations into the proposed Painesville Wastewater Treatment Plant. We have been informed by the City Manager, Mr. Dale F. Belsel, that the wastewaters will probably be accepted. We will continue to work closely with the City of Painesville on its implementation; and

b. During the next permit year:

(1). We conduct an extensive program within the various departments and plants aimed towards reducing the suspended solids load going into the Hydrogate basin. This and similar work shall continue.

2. Submit to the Division of Engineering, at regular monthly intervals, reports to include information regarding flow volumes and pertinent analytical data on the industrial waste discharges.

Reports setting forth information regarding flow volumes and pertinent analytical data on the industrial waste discharges have been submitted to the Division of Engineering, Ohio Department of Health, at regular, monthly intervals.

3. Submit to the Ohio Department of Health prior to July 1, 1969, a proposed schedule for plans and construction of facilities for further reduction of solids and chlorides.

The requested schedule for plans and construction of facilities for further reduction of solids and chlorides has been submitted. Please see our letters dated June 27, 1969, and August 19, 1969.

4. Promptly report to the Division of Engineering the occurrence and cause of any accidental or intermittant discharges of wastes which may have a deleterious effect on the receiving stream.

C202336

As outlined in previous applications, slug discharges are not experienced in the normal course of company operations. All major processes are on a continuous rather than a batch basis, so the normal waste flow is relatively constant in concentration and volume. The possibility of equipment failure, such as tank ruptures, pipe breaks, and the like, is minimized by regular and frequent inspection by both plant and insurance company personnel. Raw and in-process materials whose accidental loss by reason of equipment failure or damage are provided with secondary protection in the form of dikes, retaining pits, or pumps.

In the event of emergency or accidental discharge of concentrated wastes, the following procedure has been instituted: The responsible supervisor will immediately report the discharge to the Works Manager. If the discharge is one which will present a hazard to establishments in the vicinity, the Works Manager will notify the State Department of Health and others affected in the vicinity of the discharge and the characteristics of the material. He will also recommend (in cooperation with the Department of Health) immediate steps to avoid damage which might result from the use of the polluted water. After the immediate danger is past, the cause of the discharge will be determined and appropriate steps taken to prevent recurrence.

5. <u>Submit to the Division of Engineering information pertaining to any plant expansion or process changes which may affect the character of the industrial waste discharges, together with a proposal for providing controls for such discharges so that there will be no deleterious effect on the receiving stream.</u>

There has not been any plant expansions and/or changes in process which may significantly affect the industrial wastes treatment and disposal problems. When such plant expansions and/or changes in process develop, information concerning the same, together with our proposal for adjustments or improvements to the industrial wastes disposal facilities will be submitted.

RDH:mk
9/10/69

Diamond Shamrock

August 17, 1976

Mr. Henry Modetz, Chief
Compliance Section
Air Enforcement Branch
U. S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Re: Painesville, Ohio Works
File: 7505 A

Dear Mr. Modetz:

Attached is item I.C. of the Compliance Status Information report. As per a telephone conversation between Paul Dugas of our office and Bruce Varner of your office, item I.D. will be completed and submitted when the active disposal site is converted to an inactive disposal site.

If you have any questions, please contact me.

Sincerely,

DIAMOND SHAMROCK CORPORATION

S. G. Lant,
Regional Environmental Control Manager
Safety & Environmental Engineering Dept.

SGL:lb
Attachment

cc: Mr. J. T. Ferguson - Room 1607
Mr. J. W. Ivie - Painesville Works
Mr. R. H. Parsons - Painesville Works

EXHIBIT 17

Thickness = _____ inches Density = _____ g/cm³

B. If a wet collection device is specified in Item 4a, give the designed unit contacting energy in inches water gauge.

- Unit contacting energy = _____ inches w.g.

C. DISPOSAL OF ASBESTOS-CONTAINING WASTES. Part C should be completed separately for each asbestos-containing waste generation operation arising from sources subject to §61.22 (a), (b), (c), (d), (e), and (f).

DUP 1-13 | 14–16 | 17–18 [0 0] | 19 [5] | 20 SCC | 27 | 28–29 [F] NESHAP | 30 CS | 31 DIP | 32–33 [A B] | 34 REGULATION 40 | 41 FC

1. WASTE GENERATION - Provide a brief description of each process that generates asbestos-containing waste (e.g., disposal of control device wastes).

DUP 1-15 | 19–20 [G 1] | 21 [A S B E S T O S C O N C E N T R A T O R] 43 | 44 [0.0 2 1 4] % | 50 [X] | 51

PROCESS DESCRIPTION

2. ASBESTOS CONCENTRATION - Indicate the average percentage asbestos content of waste materials.

3. AMOUNT OF WASTES - Indicate the average weight of asbestos-containing wastes disposed of, measured in kg/day.

DUP 1-15 | 19–20 [G 2] | 21 [1 8 1 6 0 0] 32 | 33 [K G / D A Y] 39 | 40

4. CONTROL METHODS - Indicate the emission control methods used in all stages of waste disposal, from collection, processing, and packaging to transporting and disposition.

DUP 1-15 | 19–20 [G 3] | 21 [P R I M A R Y C O N T R O L M E T H O D] 43

[S L U R R Y H A N D L E D W E T L A N D F I L L E D] 79 | 80

DUP 1-15 | 19–20 [G 4] | 21 [C O V E R E D]

81 | 79 | 80

5. WASTE DISPOSAL - Indicate the type of disposal site (sanitary landfill, open, covered) or incineration site (municipal, private) where the waste is disposed of and who operates the site (company, private, municipal). State the name and location of the site (closest city or town, county, state).

DUP 1-15 | 19–20 [G 5] | 21 [T Y P E O F S I T E] 33 | 34 [L A N D F I L L C O V E R E D] 50

[P R I V A T E C O M P A N Y] 79 | 80

DUP 1-15 | 19–20 [G 6] | 21 [O P E R A T O R] 30 | 31 [D I A M O N D S H A M R O C K C O R P] 50

[E A T R P O R T L A R B O R L A K E O H I O] 79 | 80

C202257

DUP 1-18 67 LOCATION:

PATINESVILLE WORKS PATINESVILLE OHIO

D. WASTE DISPOSAL SITES. Part D should be completed separately for each asbestos waste disposal site subject to section 61.22(i).

DUP 1-18 00 5 SCC NEDS & REF CS SIP

AB POLLUTANT REGULATION CC

WASTE DISPOSAL SITE

1. DESCRIPTION - Provide a brief description of the site, including its size and configuration, and the distance to the closest city or town, closest residence, and closest primary road.

DUP 1-18 61 SITE DESCRIPTION:

DUP 1-18 62 DISTANCE: TOWN: KM

RESIDENCE: KM ROAD:

KM

2. INACTIVATION - After the site is inactivated, indicate the method or methods used to comply with the standard and send a list of the actions that will be undertaken to maintain the inactivated site.

DUP 1-18 63 COMPLIANCE METHOD/INACTIVE SITE

EPA Form 7600-1 (3-75) PAGE 4 OF 5

C202258

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION V

IN THE MATTER OF: DIAMOND SHAMROCK CORPORATION PAINESVILLE TOWNSHIP, OHIO	)))	Response to Information Request

Diamond Shamrock Corporation (the "Company"), formerly Diamond Alkali Company, operated a chrome plant (the "Plant") at Painesville, Ohio from October, 1931 until January, 1972. Four chrome chemicals were produced at the Plant; sodium dichromate, sodium chromate, potassium dichromate and chromic acid. The manufacturing processes of the chrome chemicals also resulted in the production of two marketable non-chrome by-products; sodium sulfate and aluminum hydroxide.

The process by which sodium dichromate was manufactured was the primary chemical process at the Plant. Each of the other three chrome chemicals was manufactured in a process starting with finished sodium dichromate. The sodium dichromate manufacturing process was also the major one at the Plant that resulted in the production of solid waste as defined in the Information Request.

The sodium dichromate manufacturing process produced sodium dichromate from chrome ore and soda ash. The chrome ore used in the process typically contained around forty-five percent chrome, large concentrations of iron, aluminum and magnesium and much lesser concentrations of silicon, manganese, titanium and vanadium. The chrome ore was crushed, dried and ground to a specified fineness. It was then mixed with soda ash, lime, and leached residue from a previous roasting process.

After mixing, the mixture was roasted in a rotary kiln at about 1100 to 1150°C for about four hours. The roast was then sent through a cooler to the leaching operation, which dissolved the sodium chromate. This leaching operation served to separate the raw liquor containing the sodium chromate from the leached residue which constituted the

EXHIBIT 18

major solid waste generated at the Plant. The composition and disposal of this waste will be discussed infra.

The major impurity in the sodium chromate solution, aluminum, was removed by hydrolysis. The aluminum was removed in this manner in the form of aluminum hydroxide, a marketable by-product.

The sodium chromate liquor was converted to sodium dichromate by reacting it with sulfuric acid. This operation involved treating the liquor with sulfuric acid and sending it through an evaporator, a crystallizer and a dryer. Three compositions emerged in the course of this operation; the finished sodium dichromate, sodium sulfate which is a marketable by-product, and the remaining dichromate liquor which was recycled to the evaporator or hydrolyzer.

The finished sodium dichromate, in addition to being marketed itself, was used in the production of the other three chrome chemicals. High purity sodium chromate was made by means of a simple reaction of sodium dichromate and soda ash. Any potential waste from this process was recycled to the sodium dichromate production process to reclaim residual chromium values.

Potassium dichromate was manufactured by reacting sodium dichromate with potassium chloride. The hot solution of these salts could be separated into potassium dichromate and sodium chloride, as the potassium dichromate crystallizes upon cooling whereas sodium chloride does so upon boiling. The potassium dichromate crystals were centrifuged, washed and dried. The used chromate liquor was recycled into the process.

The waste from the production of potassium dichromate consisted of a sodium chloride solution containing approximately one percent potassium chromate. This solution was treated with sulfur dioxide to reduce the hexavalent chromium to trivalent chromium. It was then treated with alkaline lime to produce chrome hydroxide, which precipitated out of the solution prior to discharge into the Grand River. Cooling water used in the evaporation procedure, which also picked up residual amounts of chromium, was similarly

C100611

e its discharge. The best possible timates indicate that the total ... rged to the Grand River contained a maximum amount of solid materi of ay from 1938 through 1970.

other product which the Company manufactured at the Plant was chromic s produced by the reaction of sodium dichromate with sulfuric acid. Upon d in a reactor, the mixture broke down into chromic acid and sodium bisulfate. c acid was drawn off and solidified on water-cooled flaking rolls. The sodium hich contained dissolved chromic acid and chromic sulfates was recycled to the chromate process, added at the stage at which the sulfuric acid was also d into the process.

us excepting the liquid waste, treated as described above, the residue resulting leaching operation during the manufacture of sodium dichromate constituted the id waste generated by production at the Plant. As discussed above, this residue mainder after the crude sodium chromate liquor had been separated by the g process. The residue was washed with water and was passed through a final filter It was then loaded on railroad cars on a small railtrack system leading out to the e fields on the Plant property. A locomotive crane was used to unload the rail cars discard this residue on open piles. The residue finally served as landfill on the ises surrounding the Plant. The exact area utilized in this manner can be discerned m the enclosed scale map marked Exhibit A. No solid waste was removed from the nt site or disposed of by other methods. Approximately fifty-four tons of residue per were generated and disposed of by this process.

The chemical composition of this solid residue, which was insoluble in water, was follows, based on a typical analysis on a dry basis:

Iron as Fe_2O_3	43.0%
Aluminum as Al_2O_3	9.0%
Magnesium as MgO	11.5%

C100312

Chromium as Cr_2O_3	7.0%
Silicon as SiO_2	4.0%
Calcium as CaO	11.0%
Sodium as Na_2O	3.0%
Vanadium as V_2O_5	0.75%
Titanium as TiO_2	1.0%
SO_4	1.0%
Chlorine	0.25%
Loss on Ignition	8.0%

Upon the shutdown of the chrome plant operations in early 1972, a contract was let for the total removal of all buildings and equipment from the Plant site, including the destruction of the foundations down to a normal ground level. Steel from the equipment and building structures was hauled to steel mills for reprocessing, and rubble was discarded on the property in low areas. Following the general grading of the area, there has been an ongoing land reclamation project of systematic property enclosure which is continuing today. This project included the temporary containment of the property in early 1974, following the removal of equipment and buildings, when a light covering of clay was applied to all of the landfill areas. In early 1976 an additional contract was entered into with the Cleveland Electric Illuminating Company whereby the Company is obtaining fly ash from their coal generating plant in Eastlake, Ohio. On a daily basis since 1976, the Illuminating Company has been depositing fly ash at the Plant site. The present land reclamation plan includes covering all solid wastes with a minimum of three feet of fly ash, covering the fly ash with two feet of compactible clay, and a final layer of top soil and planting grass and crown vetch in that soil.

In addition to chromium ore residue deposited in the area of the chromium chemicals plant site, the Company operated a landfill for the disposal of limited research quantities of chemicals. The site is approximately one acre in size and is presently

C100813

capped closed and surrounded by a fence. Enclosed marked Exhibit B is a site plan showing the location of this site.

This one-acre site was utilized from about 1963 through 1970, at which time it was closed. The site was operated by excavating approximately 15 to 20 feet deep and 8 to 10 feet wide as indicated in the diagram attached. Drum quantities of chemicals were then placed in the excavations to approximately 3 feet below the surface level. The trench was then back filled to about one foot above surface grade with clay taken from the next excavation or a clay pit.

A list of the type, amount and date of material deposited has been maintained. As many of these materials involved only limited research quantities of chemicals, and were mixtures from various studies, the enclosed list, marked Exhibit C, lists the materials by classes.

In addition to being capped and fenced, this area has been drilled with four groundwater monitoring wells around the site. Drilling logs were made to indicate depth and types of clays underlying the site. The wells were drilled to the shale level where water was observed within a few days of drilling. Complete drilling log information is enclosed as Exhibit D. Since the drilling has been completed, two groundwater samples have been taken and analyzed for three compounds considered to be excellent indicators of possible subsurface migration to groundwaters. These compounds are hexachlorobutadiene, hexachlorobenzene and carbon tetrachloride. Dates and results of these analyses are also enclosed, marked Exhibit E.

The Company has monitored chromium presence in the Grand River since 1965. The concentrations reflect the active operation of the Plant until 1972, and any possible releases occurring since its closure. All monitoring data is enclosed, marked Exhibit F. There is no data which indicate that any adverse health or environmental effect has

C100814

occurred as a result of solid wastes generated or disposed of by the Company due to its operation of the Plant.

To the best of the information, knowledge and belief of the undersigned, all statements herein contained are true and accurate and all documents submitted herewith are true and authentic.

DIAMOND SHAMROCK CORPORATION

By [signature]
Group Leader, Research & Development
Dated July 1, 1980

County of Cuyahoga)
)
State of Ohio)

I, Nancy Jo Williams a notary public in and for said county and state do hereby certify that on May 7, 1980 the aforesaid Edward F. Foley, known to me to be the person whose name is hereinabove subscribed, personally appeared before me and acknowledged that being aware of the contents of this Response to Information Request, he executed the same for Diamond Shamrock Corporation.

[signature]
NANCY JO WILLIAMS
Notary Public, State of Ohio - Cuya. Cty.
My Commission Expires Sept. 26, 1983

C100815

LIST OF EXHIBITS

EXHIBIT A - Scale map showing area on which chrome ore residue was utilized as land fill and on which land reclamation project is in progress.

EXHIBIT B - Site plan of one-acre site

EXHIBIT C - List of materials deposited in one-acre site

EXHIBIT D - Drilling logs

EXHIBIT E - Groundwater analysis

EXHIBIT F - Chromium monitoring data

(6 pages)

I.) SUMMARY OF CHROME IN THE GRAND RIVER (Downstream of Chrome Plant Site)

	HEXAVALENT CHROME (ppm)			TOTAL CHROME (ppm)		
YEAR	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.
1965	--	0.189	--	--	--	--
1966	0.102	0.368	1.95	--	--	--
1967	0.052	0.142	0.326	--	--	--
1968	0.124	0.249	0.525	--	--	--
1969	0.058	0.132	0.250	--	--	--
1970	0.071	0.168	0.297	--	--	--
1971	0.061	0.241	0.690	--	--	--
1972	0.030	0.120	0.730	0.03	0.135	0.76
1973	0.010	0.024	0.050	0.02	0.035	0.06
1974	0.010	0.019	0.030	0.02	0.026	0.03
1975	0.010	0.020	0.030	0.02	0.034	0.06
1976	0.020	0.025	0.030	0.03	0.047	0.07

NOTE: 1965 thru 1972 Average of 12 months data
1972 Jan. thru Nov. Average
1973 Jan. thru Oct. Average
1974 Average of 12 Months
1975 Jan. thru Nov. Average
1976 Jan. thru June Average

NOTE: Above data taken by Diamond Shamrock Corporation.

II.)

DATE	HEXAVALENT CHROME	TOTAL CHROME	CHLORIDES
7/23/79	<0.01	0.043	740
*8/2/79	0.094	0.159	450
8/17/79	0.022	0.023	566
9/15/79	<0.01	<0.01	1.6
10/11/79	<0.01	0.013	35
*11/6/79	0.025	0.020	327
11/27/79	<0.01	0.01	60
12/5/79	0.031	0.032	158
*1/4/80	0.037	0.033	176
4/7/80	<0.01	<0.01	96

All results in parts per million.

*Sample taken 8/2/79, heavy rains the night before, no noticeable flow in river at time of sampling. Discrepancy between Cr^{+6} and Total Cr attributable to use of different analytical methods. It is assumed that all chrome detected on these samples was hexavalent.

NOTE: Above data taken by Diamond Shamrock Corporation.

SUMMARY OF CHROME IN THE GRAND RIVER (Downstream of Chrome Plant Site)

III.) Sample taken 12/6/79 at location #2 (See Ohio EPA data from March 5, 1980 correspondence attached) and split with Ohio EPA. Diamond Shamrock Analysis:

Hexavalent Chrome	30.7 ppm
Total Chrome	39.1 ppm

IV.) Sample Analysis - Samples taken 2/28/80 and split with Bill Harris, Enforcement Division, Region V, U.S. EPA, during site inspection. Diamond Shamrock Analysis:

EPA SAMPLE DESIGNATION

Hydro or Retention Basin Discharge	<0.02 ppm Hexavalent Chrome
Seepage North	<0.02 ppm Hexavalent Chrome
Seepage South	0.038 ppm Hexavalent Chrome

DATA OBTAINED FROM THE OHIO ENVIRONMENTAL PROTECTION AGENCY ON THE GRAND RIVER

Samples taken at Route 84 Bridge (Upstream of Site) and at Route 535 Bridge (Downstream of Site). All results are micrograms/liter (µg/l)

DATE	Chromium (@ Route 84)	Chromium (@ Route 535)
1/14/76	<30 (Hexavalent Cr)	<30 (Hexavalent Chrome)
7/15/76	<30 (Hexavalent Cr)	30 (Hexavalent Chrome)

Note: All other OEPA analysis on total Chromium

10/27/76	<30	<30
2/23/77	--	<30
5/19/77	<30	<30
6/28/77	<30	<30
7/13/77	<30	<30
8/24/77	<30	<30
9/28/77	<30	<30
10/19/77	<30	<50
11/9/77	<30	--
12/22/77	<30	--
1/19/78	<30	--
2/8/78	<30	--
3/8/78	<30	<30
4/5/78	<30	--
5/10/78	<30	--
6/14/78	<30	<30
7/26/78	<30	--
8/10/78	<30	<30
9/19/78	<30	--
10/18/78	<30	<30
1/31/79	<30	<30
3/22/79	--	50
4/17/79	<30	--
5/24/79	--	60
7/24/79	<30	--
12/6/79	--	40
12/7/79	--	40
12/12/79	--	50

Note: Ohio Water Quality Standard Total Chromium = 0.100 mg/l

PAINESVILLE

Site Number	Date	Total Chromium	Site Description
1	10/31/79	16,900 ppm	soil surface
2	12/6/79	14,300 ug/l	run-off to river
3	10/31/79	8,200 ug/l	rip-rap run-off
4	10/31/79	30 ug/l	old Diamond outfal
4	8/15/79	<30 ug/l	old Diamond outfal
5	8/15/79	70 ug/l	Grand River downst Diamond
6	8/15/79	60 ug/l	Grand River downst dump
7	8/15/79	<30 ug/l	Grand River upstre dump
8	10/4/79	34,500 ug/l	North river bank 1
9	10/4/79	153,000 ug/l	inland run-off

Site Number	Date	Dissolved Solids	Site Description
10	10/31/79	108,000 mg/l	leachpool

GRAND RIVER

TOTAL CHROMIUM CONCENTRATIONS AT S.R. 535

Date	Total Chromium (ug/l)
10/18/78	<30
1/31/79	<30
3/22/79	50
5/24/79	60
12/6/79	40
12/7/79	40
12/12/79	50

GRAND RIVER

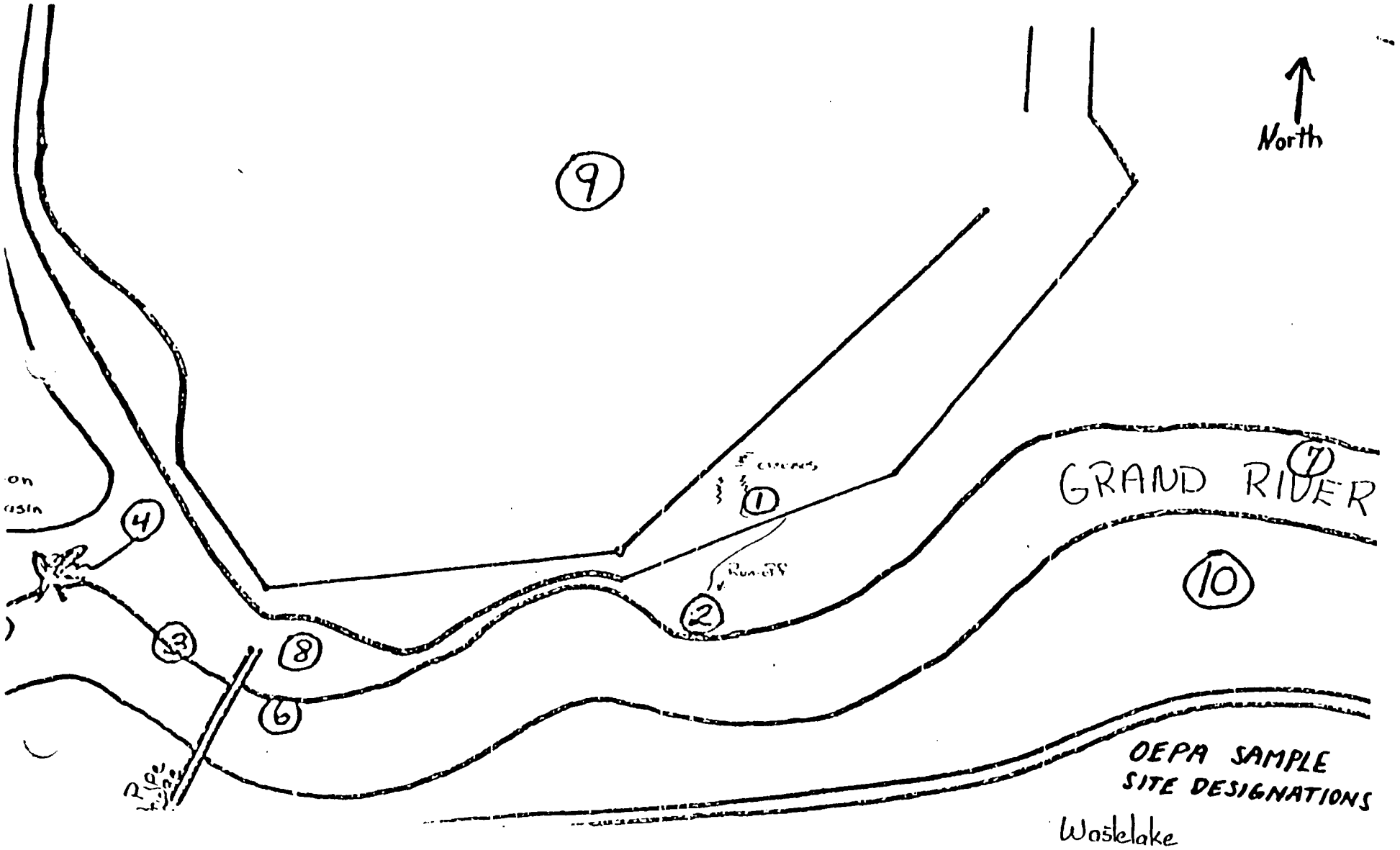
TOTAL CHROMIUM CONCENTRATIONS AT ST. CLAIR AVE.

Date	Total Chromium (ug/l)
12/5/79	50
12/7/79	40
12/12/79	40

GRAND RIVER

TOTAL CHROMIUM CONCENTRATIONS AT S.R. 535 FROM
FROM USGS STATION 0421220

	Number of samples	Mean	Maximum	Minimum
Cr - dissolved	8	30	68	2
Cr - Suspended	8	11	29	0
Cr - Total	8	40	70	10


North
9
GRAND RIVER
7
10
1
2
3
4
6
8
OEPA SAMPLE
SITE DESIGNATIONS
Wastelake

C100822

Water Repellent

SW-71239 - Shipped 12/6/67

Material is a liquid consisting principally of perchloroethylene (65%) and aluminum stearate (27%) with the balance made up of additives (chrome complexes).

HCBD Still Bottoms

SW-71240 - Shipped 12/14/67

Distillation residues from purification of Hexachlorobutadiene. Bottoms are semi-solids containing principally Hexachlorobutadiene, Hexachlorobenzene, Trichlorobenzene.

Diablo 700X -Scrap

SW-71240 - Shipped 12/14/67

Off-grade product, liquid, containing 70% chlorine. Similar to Chlorowax 70, except Nonene is the base material.

Filtrate - Tetrachloro-p-xylene Process

SW-71240 - Shipped 12/14/67

Di and Tetrachloro-p-xylene dissolved in Varnolene solvent. Material is acidic and has a strong smell. Can slowly decompose releasing HCl. Material in drums is a semi-solid.

DION Polymercaptan

SW-71240 - Shipped 12/14/67

Scrap DPM is a viscous liquid material that cannot be incinerated. It is stable and not corrosive.

Filtrate - Hexachloro-p-xylene

SW-71240 - Shipped 12/14/67

Similar to filtrate from Tetrachloro-p-xylene except principal materials are tetra, tri, and hexachloro-p-xylene in Varnolene solvent. Can slowly decompose releasing HCl. Material in drums is semi-solid.

WASTE DISPOSAL

9/8/66	250#	Waste IPN & DAC 2787
9/29/66	750#	Waste IPN & DAC 2787
8/4/66	1200#	Waste IPN & DAC 2787
8/11/66	100#	Waste IPN & DAC 2787
8/11/66	350#	Scrap PVF Resin
8/18/66	1200#	DAC 2787 in sand blast residue
8/18/66	350#	Waste IPN & DAC 2787
8/25/66	200#	DAC 2787 in sandblast residue
8/25/66	400#	Scrap PVF Resin
7/6/66	200#	Waste IPN & DAC 2787
7/14/66	536#	Waste IPN & DAC 2787
6/2/66	50#	Scrap PVF Resin
6/9/66	250#	Waste IPN & DAC 2787
6/23/66	200#	Waste IPN & DAC 2787
6/30/66	150#	Waste IPN & DAC 2787
5/5/66	600#	PVF Resin
5/5/66	200#	Waste IPN & DAC 2787
5/5/66	100#	Alamine
5/13/66	350#	Waste IPN & DAC 2787
4/5/66	750#	Waste IPN & DAC 2787
4/5/66	300#	Diisoyanate Waste
4/8/66	125#	Waste IPN & DAC 2787
4/14/66	750#	Waste IPN & DAC 2787
4/29/66	1200#	Waste IPN & DAC 2787
3/3/66	200#	Carbon Catalyst
3/3/66	1000#	Waste IPN & DAC 2787
3/10/66	750#	Waste IPN & DAC 2787
3/17/66	1900#	Waste IPN & DAC 2787
3/24/66	800#	Waste IPN & DAC 2787
3/29/66	650#	Waste IPN & DAC 2787
2/3/66	250#	Waste IPN & DAC 2787
2/3/66	275#	Scrap PVF Resin
2/10/66	900#	Waste IPN & DAC 2787
2/17/66	1800#	Waste IPN & DAC 2787
2/24/66	800#	Waste IPN & DAC 2787
1/7/66	250#	Misc. Small Samples
1/13/66	175#	Waste IPN & DAC 2787
1/20/66	1800#	Waste IPN & DAC 2787
1/20/66	170#	Titanium Sponge
1/28/66	1500#	Waste IPN & DAC 2787
12/2/66	1500#	Waste IPN & DAC 2787
12/9/66	150#	Waste IPN & DAC 2787
12/9/66	125#	Scrap PVF Resin
12/16/66	225#	Waste IPN & DAC 2787
12/16/66	20#	Sodium Sulfohydrade
12/23/66	250#	Waste IPN & DAC 2787
12/30/66	30#	p-1-0-0
12/1/65	--	Month of November, no deliveries of waste material.
11/1/65	--	" " October, " " " " "
10/1/65	--	" " September, " " " " "
9/1/65	--	" " August, " " " " "

C100824

WASTE DISPOSAL

7/22/65	50#	Scrap PVF Resin
6/23/65	600#	Disodium Methane Arsenate
5/3/65	--	Month of April, no deliveries of waste material.
1/8/65	100#	Misc. small samples
1/14/65	100#	Polyacetyl waste
1/21/65	100#	Misc. small samples
1/28/65	450#	Misc. small samples
1/28/65	20#	Ethylene dichloride
1/28/65	50#	Polythi
1/28/65	50#	Methyl Methacrylate
1/28/65	20#	Dimethyl Formamide
2/4/65	75#	Misc. small samples
2/25/65	50#	p-1-0-1
2/25/65	250#	Diisocyanate waste
2/25/65	120#	Misc. samples
3/4/65	200#	Misc. samples
3/18/65	250#	Misc. samples
3/25/65	150#	Misc. samples
10/1/64	75#	Small samples
10/15/64	50#	Small samples
11/17/64	175#	Dimethyl Formamide
11/26/64	75#	Unreactive waste
12/--/64		Nothing to Coke Plant area.
12/22/64	8 Drums	Solid waste from the Dion Polysulfide Plant.
11/4/64	30 Drums	Hexachlorobutadiene
11/4/64	5 Cars	Hexachlorobutadiene
7/16/64	30#	Dichloro-p-Xylene
7/16/64	20#	Antimony Trioxide
8/20/64	500#	Hexachloro-p-Xylene
8/27/64	2500#	Hexachloro-p-Xylene
8/27/64	25#	Small samples
9/25/64	200#	Small samples
4/2/64	200#	Polyol samples
4/2/64	100#	Polymercaptan waste
4/2/64	100#	Broken glass
4/2/64	275#	Contaminated containers and trash.
4/7/64	750#	Polyol
4/7/64	95#	Small samples
4/7/64	200#	Contaminated container & trash.
4/9/64	90#	Drierite
4/9/64	25#	Polyol
4/9/64	100#	Contaminated trash
4/16/64	350#	Diisocyonate waste
4/16/64	2000#	Hexachloro-m-Xylene
4/16/64	500#	Diablo 700X
4/16/64	225#	Isophthaloyl Chloride
4/23/64	500#	Contaminated Transite
4/23/64	125#	Contaminated Trash
4/23/64	3000#	Polyol

WASTE DISPOSAL

5/7/64	100#	Misc. small samples
5/28/64	200#	Misc. small samples
5/28/64	75#	Hexachloro-m-Xylene
6/4/64	100#	Misc. small samples
6/18/64	350#	Herbicide
6/18/64	50#	Polythi waste
6/26/64	40#	DAC-1200
6/26/64	250#	Amberlite LA-2
6/26/64	50#	Orthodichlorobenzene
4/24/64	4 Drums	Scale Wax
4/24/64	3 Drums	Formaldehyde
4/24/64	1 Drum	Oleic Acid
4/24/64	3 Drums	Monoethanolamine
4/24/64	6 Drums	Methly Monochloroacetate
4/24/64	4 Drums	Neosapon CF-11 Waste
4/27/64	9 Drums	Acetone Waste
4/27/64	7 Drums	Methyl Monochloroacetate - Still Bottoms
4/27/64	6 Drums	Organic Waste
1/9/64	50#	Phosphorous Polyols
1/9/64	200#	Small samples
1/9/64	25#	Broken glass
1/9/64	100#	Contaminated containers
1/23/64	200#	TTD
1/23/64	300#	Misc. waste chemicals
1/23/64	20#	Phosphorous polyol
1/23/64	25#	Contaminated containers
1/30/64	200#	Contaminated trash
1/30/64	50#	Contaminated plastic hose
1/30/64	50#	Polyol
1/30/64	25#	DAC-559
2/13/64	125#	DAC 559
2/13/64	100#	Polyurethane foams
2/13/64	50#	Misc. small samples
2/13/64	75#	Broken glass
2/20/64	100#	Polythi
2/20/64	200#	DAC 559
2/20/64	125#	Misc. small samples
2/20/64	200#	Contaminated trash
2/20/64	50#	Broken glass
2/27/64	375#	DAC-559
2/27/64	150#	Misc. small samples
2/27/64	50#	Broken glass
2/27/64	50#	Misc. chemicals
3/5/64	250#	Misc. small samples
3/5/64	100#	Contaminated trash
3/5/64	75#	Contaminated plastic hose
3/5/64	100#	Contaminated containers
3/12/64	100#	Misc. small samples
3/12/64	75#	Broken glass
3/12/64	75#	Contaminated trash
3/18/64	75#	Polythi waste
3/18/64	100#	Small samples

WASTE DISPOSAL

3/18/64	50#	Broken glass
3/18/64	50#	Contaminated trash
3/25/64	100#	Polythi waste
3/25/64	75#	Contaminated trash
3/25/64	100#	Misc. small samples
3/25/64	100#	Used containers
10/4/63	250#	DAC-559
10/4/63	25#	Misc. small samples
10/11/63	2000#	Phosphorous polyol
10/18/63	100#	DAC-559
10/18/63	25#	Phosphorus polyol
10/18/63	100#	Misc. samples
10/18/63	50#	Antimony oxide
10/25/63	50#	Misc. samples
10/25/63	50#	Contaminated hose, plastic bags, & containers
10/31/63	15#	Phosphorous pentoxide
10/31/63	100#	Sump settlings
10/31/63	150#	Misc. small samples
11/7/63	100#	DAC-559
11/7/63	50#	Misc. chemical trash
11/7/63	20#	Samples
11/7/63	35#	Broken glass
11/14/63	50#	Misc. chemicals
11/14/63	50#	Broken glass
12/12/63	50#	Small samples
12/12/63	25#	Broken glass
12/19/63	50#	Contaminated containers & trash
9/26/63	2 Drums	MMCA Still Bottoms (methyl-monochloroacetate)
9/26/63	2 Drums	MMCA Esterifier Bottoms (methyl-monochloroacetate)
9/26/63	1 Drum	HCBD Bottoms - (Hexachlorobutadiene)
9/26/63	1 Drum	MMCA Samples - (Methyl-monochloroacetate)
6/19/63	12 Drums	M-141 - (2100#)
6/19/63	17 Drums	Misc. Solvents (55 gals.)
6/28/63	3 Cardboard Boxes	DAC-893 samples
6/28/63	3 "	Misc. chlorinated xylene samples
6/28/63	8 Cartons	Sodium CMC - (Carboxy-methylcellulose)
6/28/63	15 Cartons	DT Whitener
6/28/63	3 Cardboard Boxes	TTD
6/28/63	3 "	Dichlorophenol (samples)
6/28/63	1 Jug	Recovered Aniline
6/5/63	2 Drums	Waste Polyol (55 gals.)
6/5/63	1 Small Drum	Misc. hose, plastic bags, etc.
7/12/63	1 Drum	Waste DAC-559 (55 gals.) & used 559 bags
7/12/63	1 Carboy	(Plastic) waste polyol solvent
7/12/63	Several	Misc. waste solvents from "A" Bldg.
7/19/63	10 Cans	(Waste Polyol (5 gals.)
7/19/63	1 Drum	Waste Methylene Chloride from Polyol (25 gals.)

WASTE DISPOSAL

7/19/63	1 Drum	Misc. hose, bags, etc.
7/19/63	Several	Misc. waste solvents from "A" Bldg.
7/25/63	2 Drums	Cyanuric Acid (145#)
7/25/63	1 Drum	$CiCl_3$ (20#)
7/25/63	2 Drums	Trichlorophenol (100 gals.)
7/25/63	500#	Ferrochrome Silica
7/26/63	100#	Di amino stilbine di sulfonic acid
7/26/63	15 Gals.	Polyether samples
7/26/63	1 Drum	Silicon
7/26/63	1 Drum	Alumina (150#)
7/26/63	7 Cans	Waste Polyol (5 gals.)
7/26/63	1 Drum	Misc. chemical trash (hoses, bags, etc.)
7/26/63	1 Drum	559 trash (bags, etc.)
8/2/63	1 Drum	Samples: Xylenes & derivatives (55 gals.)
8/2/63	1 Drum	Misc. chemical trash
8/9/63	1 Drum	Misc. Polyol samples
8/9/63	Several	Misc. waste solvents from "A" Bldg.
8/16/63	2 Drums	Waste Polyol (55 gals.)
8/16/63	Several	Misc. waste solvents from "A" Bldg.
8/16/63	1 Drum	Misc. chemical trash
8/30/63	1 Drum	Chlorinated PVC - (about 40#)
8/30/63	1 Drum	Misc. chemical trash
9/6/63	1 Drum	PVC-450 (100#)
9/6/63	50#	Sodium chloroacetate
9/6/63	10 Gals.	Misc. waste from "A" Bldg.
9/6/63	10#	Misc. small samples
9/6/63	1 Drum	DAC-559 - (40#)
9/6/63	1 Gal.	Ethylene Glycol
9/6/63	25#	KCl
9/6/63	25#	NH_4Cl
9/6/63	10#	Di bromo sentane
9/6/63	10#	Zinc Chloride
9/6/63	25#	Dolomite
9/6/63	2 Gals.	Chloro still bottoms
9/6/63	Several	Misc. waste solvents from "A" Bldg.
9/20/63	50#	Photine C
9/20/63	120#	Refractory Cement
9/20/63	70#	Ammonium Sulfate
9/20/63	200#	Peraclase
9/20/63	300#	Caustic Soda (solid)
9/20/63	150#	Polyol
9/20/63	Several	Misc. waste solvents from "A" Bldg.
9/27/63	50#	Polyol mixture
9/27/63	1 Drum	(Part full) mostly water - coated with urethane
9/27/63	100#	DAC-559 waste (removed from drum by error)

WASTE DISPOSAL

6/13/63	17 - 55 Gal. Drums		Hexachlorobenzene (HCB) & Hexachlorobutadiene (HCBD)	
8/17/70	341 - 380#	Drums	CWX 500 (98.9 Tons)	
"	117 - 525#	"	CWX 40 (30.7 ")	
"	10 - 500#	"	CWX 40LV (2.5 ")	
"	48 - 525#	"	ECCl (12.6 ")	
"	In Process CCl_4 Materials		Crude -- 50% CCl_4, 50% S_2Cl_2	14,185 Gals.
"	" " " "		Settlings & residue -- 90% S_2Cl_2, 10% CCl_4	12,045 "
"	" " " "		Stripper Feed - 95% S_2Cl_2, 5% CCl_4	18,000 "
"	" " " "		Sulfur - several tons	
"	" " " "		Still Toppings - 84% CCl_4, 4.5% $CHCl_3$, 6.4% CS_2	12,906 "

C100829

WASTE DISPOSAL

6/25/70	200 - 55 Gal. Drums	DAC 2787
"	79 - " " "	Safire & coal tar
"	53 - " " "	Misc. Organic chemicals
"	29 - " " "	Treated KOH
"	22 - " " "	Polysulfide
"	14 - " " "	Dichloroformal
"	13 - " " "	PVC
"	9 - " " "	PVF
"	6 - " " "	Nopcoflex-3
"	5 - " " "	Pesticide (DACTHAL herbicide)
"	5 - " " "	THF
"	4 - " " "	Analytical samples
"	4 - " " "	Ethylene Dichloride
"	4 - " " "	Silicate
"	4 - " " "	Xylol
"	3 - " " "	Polymercaptan
"	2 - " " "	Acetone
"	2 - " " "	Heptane
"	2 - " " "	Mobilsol 66
"	2 - " " "	Oil
"	2 - " " "	Polyol
"	1 - " " "	Ethylene Chlorohydrin
"	1 - " " "	Isocyanate
"	1 - " " "	Polymer solution
"	1 - " " "	Sodium Hydroxide
"	1 - " " "	Sodium Sulfide
"	1 - " " "	Toluene
"	1 - " " "	Trichlorobenzene
"	156 - 5 Gal. Drums	Misc. Organics
"	114 - " " "	Sodium Polysulfide
"	11 - " " "	Safire
9/22/69	12 - 55 Gal. Drums	Polyvinyl Fluoride
"	20 - " " "	Treated KOH
"	53 - " " "	DACONIL 2787 & Isophthalonitrile
"	19 - " " "	Carbon Catalyst
"	10 - " " "	Safire Waste
"	1 - " " "	Caustic Potash
"	10 - " " "	Polymercaptan
"	2 - " " "	Trichloropropane
"	30 - " " "	Misc. non-burnable organics
"	6 - " " "	Polysulfide
"	2 - " " "	Polyvinyl acetate
"	10 - " " "	Spent Sulfuric Acid
"	8 - 5 Gal. Drums	Polyvinyl Fluoride
"	75 - " " "	Polysulfide
"	22 - " " "	Misc. non-burnable organics

WASTE DISPOSAL

5/20/69	146 - 55 Gal. Drums	Daconil 2787
"	17 - " " "	Dion Polymercaptan
"	4 - " " "	Analytical Samples
"	33 - " " "	Organic Solvents
"	6 - " " "	Carbon Catalyst
"	2 - " " "	PVF
"	24 - " " "	Treated KOH
"	1 - " " "	Sodium Sulfhydrate
"	3 - " " "	Perchloroethylene Water Repellent
"	2 - " " "	CrO_3-t-Butanol
"	1 - " " "	Toluene with Polymercaptan
"	6 - " " "	Safire
"	1 - " " "	Acrylic Latex Waste
"	1 - " " "	Chromic Acid Waste
"	5 - " " "	2,4 - Dichlorophenoxy
"	10 - 5 Gal. Cans	Chlorinated Xylene Waste
"	2 - " " "	Oil Waste
"	30 - " " "	Organic Waste
"	1 - " " "	Dimethylformamide
"	29 - " " "	Dion Polymercaptan
"	33 - " " "	Organic Solvents
"	18 - " " "	PVF
"	2 - " " "	CrO_3-t-Butanol
"	2 - " " "	Safire

Additional Notes Related to Disposal Inventory:

1.) Waste IPN and DAC 2787
IPN - Isophthalonitrile; DAC 2787 is registered as an EPA PESTICIDE under FIFRA.

2.) PVF - Polyvinyl Fluoride

3.) DAC - 599 Internal Research Project Code. Referring to research project wastes.

4.) PVC - Polyvinyl CHLORIDE RESIN.

5.) CWX - refers to trade name Chlorowax products which are chlorinated wax materials.

6.) SAFIRE - Trade name for a sodium silicate solution product.

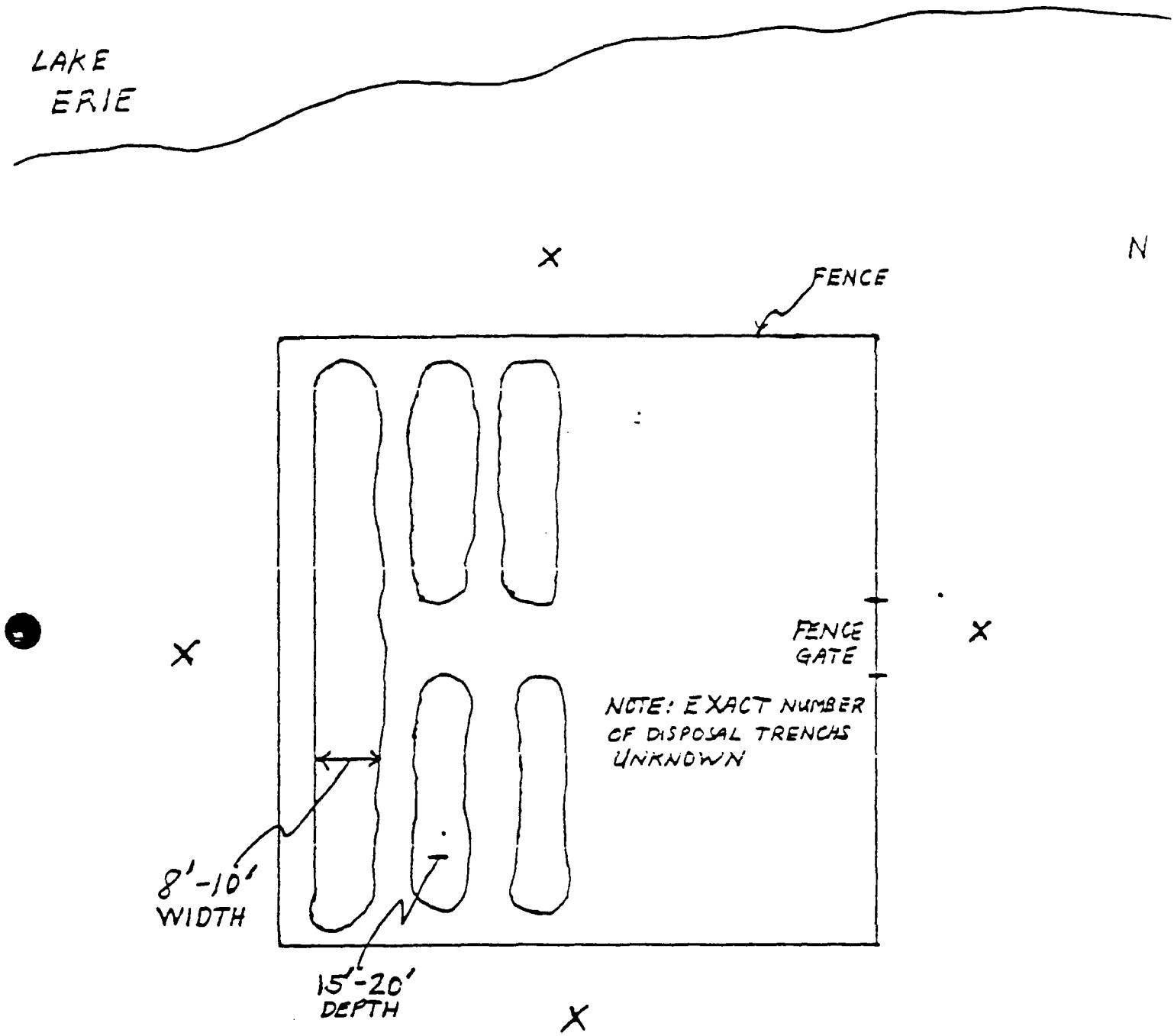
GROUNDWATER MONITORING WELL SAMPLE RESULTS

LIMITED RESEARCH QUANTITY CHEMICAL LANDFILL, PAINESVILLE, OHIO

SAMPLE DATE	WELL DESIGNATION	pH	HEXACHLORO-BUTADIENE	HEXACHLORO-BENZENE	CARBON TETRACHLORIDE
3/26/80	EAST	7.4	<0.2	<0.1	<20
	NORTH	8.9	<0.2	<0.1	<20
	WEST	9.0	<0.2	<0.1	<20
	SOUTH	7.2	<0.2	<0.1	<20
4/18/80	EAST	7.6	<0.2	<0.1	<20
	NORTH	8.6	<0.2	<0.1	<20
	WEST	9.0	<0.2	<0.1	<20
	SOUTH	8.3	<0.2	<0.1	<20

NOTE: pH in standard units; all other analysis in parts per billion. Less than levels indicated reflect lower limits of detectability.

DIAMOND SHAMROCK CORP
PAINESVILLE, OHIO



X - INDICATES GROUNDWATER MONITORING WELLS LOCATIONS

NO SCALE

J.A.L.
5/5/80

C100834

Copied 1-20-49

[illegible]

[illegible]

$CaCO_3$	67.09
$CaSO_4$	[illegible]
CaO	6.38
MgO	4.88
NaCl	4.28
SiO_2	7.09
R_2O_3	4.72
Loss Ign	1.52
	100.55

Dated 1930

[illegible]
11-24-47

EXHIBIT 7

WASTE LAKE MATERIAL

Analyses initiated [illegible] (Henry [illegible]) and probably [illegible] samples taken around 1925, although no date is given with data. Copied from [illegible] obtained from Louis Creveling.

Hole No. 2

Samples represent every two ft. to a depth of 20 feet, 40 ft. in from dyke about 1/2 distance along river from N.E. corner.

1st & 2nd Ft.				3rd & 4th Ft.			
SiO_2	2.87	SiO_2	2.87	SiO_2	1.65	SiO_2	1.65
R_2O_3	2.32	R_2O_3	2.32	R_2O_3	1.85	R_2O_3	1.85
CaO	53.89	$CaCl_2$	.94	CaO	55.23	$CaCl_2$	1.05
MgO	2.67	$CaSO_4$	2.46	MgO	1.87	$CaSO_4$	2.99
SO_3	1.45	$Ca(OH)_2$	15.54	SO_3	1.76	$Ca(OH)_2$	17.48
Cl	.60	$CaCO_3$	72.54	Cl	.67	$CaCO_3$	71.84
Loss Ign.	36.84	$Mg(OH)_2$	3.86	Loss Ign.	37.35	$Mg(OH)_2$	2.71
	100.64	L.-Ign.	.11		100.38	L.-Ign.	.81
H_2O	53.70		100.64	H_2O	53.60		100.38

5th & 6th Ft.				7th & 8th Ft.			
SiO_2	1.92	SiO_2	1.92	SiO_2	1.91	SiO_2	1.91
R_2O_3	2.09	R_2O_3	2.09	R_2O_3	2.36	R_2O_3	2.36
CaO	56.14	$CaCl_2$	1.55	CaO	55.53	$CaCl_2$	1.27
MgO	1.32	$CaSO_4$	3.04	MgO	1.74	$CaSO_4$	2.97
SO_3	1.85	$Ca(OH)_2$	23.77	SO_3	1.75	$Ca(OH)_2$	22.66
Cl	.99	$CaCO_3$	64.39	Cl	.81	$CaCO_3$	65.18
L.-Ign.	35.92	$Mg(OH)_2$	1.91	L.-Ign.	35.98	$Mg(OH)_2$	2.52
	100.23	L.-Ign.	1.56		100.08	L.-Ign.	1.21
H_2O	52.00		100.23	H_2O	50.40		100.08

9th & 10th Ft.				11th & 12th Ft.			
SiO_2	1.85	SiO_2	1.85	SiO_2	1.51	SiO_2	1.51
R_2O_3	2.43	R_2O_3	2.43	R_2O_3	2.09	R_2O_3	2.09
CaO	55.53	$CaCl_2$	1.66	CaO	56.52	$CaCl_2$	1.83
MgO	2.05	$CaSO_4$	3.35	MgO	1.51	$CaSO_4$	2.82
SO_3	1.97	$Ca(OH)_2$	23.31	SO_3	1.66	$Ca(OH)_2$	25.16
Cl	1.06	$CaCO_3$	63.70	Cl	1.17	$CaCO_3$	63.18
L.-Ign.	36.13	$Mg(OH)_2$	2.96	L.-Ign.	35.62	$Mg(OH)_2$	1.85
	101.02	L.-Ign.	1.76		100.08	L.-Ign.	1.64
H_2O	51.30		101.02	H_2O	48.80		100.08

EXHIBIT 8

Table #2

[illegible]

Sample from Waste Pond

13th & 14th Ft.				15th & 16th Ft.			
SiO_2	1.52	SiO_2	1.52	SiO_2	1.40	SiO_2	1.40
R_2O_3	2.19	R_2O_3	2.19	R_2O_3	1.80	R_2O_3	1.80
CaO	55.83	$CaCl_2$	1.99	CaO	55.45	$CaCl_2$	2.10
MgO	1.65	$CaSO_4$	2.68	MgO	1.41	$CaSO_4$	2.58
SO_3	1.58	$Ca(OH)_2$	22.85	SO_3	1.52	$Ca(OH)_2$	24.14
Cl	1.27	$CaCO_3$	65.04	Cl	1.34	$CaCO_3$	62.57
L.-Ign.	36.43	$Mg(OH)_2$	2.39	L.-Ign.	36.82	$Mg(OH)_2$	12.04
	100.47	L.-Ign.	1.81		99.74	L.-Ign.	3.11
H_2O	45.30		100.47	H_2O	48.10		99.74

17th & 18th Ft.				19th & 20th Ft.			
SiO_2	1.37	SiO_2	1.37	SiO_2	1.41	SiO_2	1.41
R_2O_3	[illegible]	R_2O_3	1.31	R_2O_3	2.00	R_2O_3	2.00
CaO	55.45	$CaCl_2$	2.66	CaO	55.38	$CaCl_2$	3.49
MgO	1.34	$CaSO_4$	2.60	MgO	1.77	$CaSO_4$	2.46
SO_3	1.53	$Ca(OH)_2$	22.29	SO_3	1.45	$Ca(OH)_2$	22.67
Cl	1.70	$CaCO_3$	64.55	Cl	2.23	$CaCO_3$	63.30
L.-Ign.	36.92	$Mg(OH)_2$	1.94	L.-Ign.	35.98	$Mg(OH)_2$	2.56
	100.12	L.-Ign.	2.90		100.22	L.-Ign.	2.33
H_2O	46.60		100.12	H_2O	47.30		100.22

W. Greene
1-26-49

C202250

WASTE [illegible]

Analyses [illegible] H.P. [illegible] samples taken around 1925 [illegible] data. Copied from sheets [illegible]

Hole No. [illegible]

Samples represent every [illegible] from break at S.W. end about 100 ft. [illegible] dike.

1st & 2nd Ft.				3rd & 4th Ft.			
SiO_2	.57	SiO_2	1.14	SiO_2	.49	SiO_2	1.02
R_2O_3	.90	R_2O_3	1.80	R_2O_3	.90	R_2O_3	2.03
CaO	27.31	$CaCl_2$	.88	CaO	25.86	$CaCl_2$	[illegible]
MgO	.87	$CaSO_4$	3.09	MgO	.88	$CaSO_4$	3.07
SO_3	.91	$Ca(OH)_2$	12.49	SO_3	.87	$Ca(OH)_2$	17.26
Cl	.28	$CaCO_3$	77.32	Cl	1.12	$CaCO_3$	67.12
L.-Ign.	19.66	$Mg(OH)_2$	2.51	L.-Ign.	18.26	$Mg(OH)_2$	2.64
H_2O	50.26	L.-Ign.	1.54	H_2O	52.28	L.-Ign.	3.95
	100.76		100.75		100.74		100.73

5th & 6th Ft.				7th & 8th Ft.			
SiO_2	.78	SiO_2	1.70	SiO_2	.67	SiO_2	1.37
R_2O_3	.95	R_2O_3	2.07	R_2O_3	.93	R_2O_3	1.88
CaO	25.18	$CaCl_2$	4.77	CaO	26.75	$CaCl_2$	4.19
MgO	.77	$CaSO_4$	2.90	MgO	.91	$CaSO_4$	2.92
SO_3	.78	$Ca(OH)_2$	23.43	SO_3	[illegible]	$Ca(OH)_2$	20.52
Cl	1.40	$CaCO_3$	59.82	Cl	1.31	$CaCO_3$	63.57
L.-Ign.	16.14	$Mg(OH)_2$	2.42	L.-Ign.	17.98	$Mg(OH)_2$	2.69
H_2O	54.18	L.-Ign.	3.07	H_2O	51.53	L.-Ign.	3.76
	100.18		100.18		100.92		100.90

9th & 10th Ft.				11th & 12th Ft.			
SiO_2	.53	SiO_2	1.12	SiO_2	[illegible]	SiO_2	1.08
R_2O_3	.87	R_2O_3	1.83	R_2O_3	.80	R_2O_3	1.71
CaO	25.74	$CaCl_2$	7.08	CaO	25.83	$CaCl_2$	10.48
MgO	.80	$CaSO_4$	2.61	MgO	.83	$CaSO_4$	2.43
SO_3	.73	$Ca(OH)_2$	21.64	SO_3	.67	$Ca(OH)_2$	23.19
Cl	2.15	$CaCO_3$	59.27	Cl	3.14	$CaCO_3$	55.79
L.-Ign.	16.98	$Mg(OH)_2$	2.45	L.-Ign.	15.31	$Mg(OH)_2$	2.56
H_2O	52.92	L.-Ign.	4.72	H_2O	53.37	L.-Ign.	3.22
	100.72		100.72		100.46		100.46

EXHIBIT 9

Hole No. [illegible]

Samples from Waste Pond

13th & 14th Ft.				15th & 16th Ft.			
SiO_2	[illegible].70	SiO_2	1.55	SiO_2	.62	SiO_2	1.25
R_2O_3	[illegible].90	R_2O_3	2.00	R_2O_3	[illegible].07	R_2O_3	2.16
CaO	23.94	$CaCl_2$	10.15	CaO	26.92	$CaCl_2$	8.31
MgO	1.20	$CaSO_4$	2.42	MgO	1.02	$CaSO_4$	2.79
SO_3	[illegible].41	$Ca(OH)_2$	23.45	SO_3	.81	$Ca(OH)_2$	20.27
Cl	2.92	$CaCl_3$	52.33	Cl	2.63	$CaCO_3$	60.24
L.-Ign.	14.50	$Mg(OH)_2$	3.85	L.-Ign.	16.54	$Mg(OH)_2$	2.99
H_2O	54.72	L.-Ign.	[illegible]	H_2O	50.64	L.-Ign.	2.34
	99.52		99.51		100.35		100.35

17th & 18th Ft.				19th & 20th Ft.			
SiO_2	[illegible].69	SiO_2	1.44	SiO_2	.66	SiO_2	1.59
R_2O_3	[illegible].98	R_2O_3	2.05	R_2O_3	1.07	R_2O_3	2.58
CaO	26.28	$CaCl_2$	7.72	CaO	21.87	$CaCl_2$	13.00
MgO	[illegible]	$CaSO_4$	3.13	MgO	1.31	$CaSO_4$	3.52
SO_3	[illegible].88	$Ca(OH)_2$	20.09	SO_3	.86	$Ca(OH)_2$	23.53
Cl	2.36	$CaCO_3$	61.67	Cl	3.45	$CaCO_3$	48.04
L.-Ign.	15.25	$Mg(OH)_2$	3.36	L.-Ign.	12.29	$Mg(OH)_2$	4.56
H_2O	51.89	L.-Ign.	[illegible]	H_2O	58.38	L.-Ign.	3.06
	99.44		99.46		99.59		99.88

U. T. [illegible]
1-26-49

C202252

WASTE LAKE MATERIAL

May 14, 1942

Office Memorandum
Mr. Schmucker

Composition of fine material in still Blowoff Liquor

The possibility exists that there is sufficient concentration of MgO in the solids in the still blowoff to make recovery of the MgO feasible. With this in mind, analyses were made of samples selected from the waste lake and by separation of the fine solids from blowoff liquor itself.

Six samples in all were examined as follows:

(1) Sample taken by Vose 11-5-41 from side of waste lake.
(2) Sample taken by Vose 11-5-41 from far end of waste lake.
(3) Settled material from lower outlet of waste lake 4-24-42.
(4) Settled material from upper outlet of waste lake 4-24-42.
(5) Fines from blowoff liquor 5-5-42 separated by classification.
(6) Fines from blowoff liquor 5-6-42 separated by classification.

Sample	1	2	3	4	5	6
SiO_2	11.51	10.61	14.16	14.88	19.24	17.62
Al_2O_3	5.32	5.60	3.71	3.62	4.83	3.61
Fe_2O_3			3.79	3.43	3.43	3.19
CaO	25.76	26.84	33.45	33.70	38.49	42.39
SO_3	1.33	1.41	3.03	2.58	4.24	3.98
MgO	30.64	26.96	14.64	13.74	11.96	10.25
Cl	.25	.37	.21	.28	.36	.13
CO_2	10.51	12.74	9.91	10.99	17.32	8.70
Loss in other than CO_2	14.38	15.05	14.98	16.88	10.70	10.19
Total	99.70	99.58	100.00	100.10	101.66	100.01

Samples 1 & 2 were taken during the time when dolomite was being burned and the dolomitic lime included with the milk of lime fed to the stills. These samples therefore represent a special case in which the MgO content of the still blowoff is abnormally high. The approximate dates when this was done are from Sept. 15, 1941, to Dec. 1, 1941.

Samples 3 - 6 represent the fine sludge from the still blowoff when using normal lime and probably represent that fraction of the solids which are richest in MgO content.

EXHIBIT 10

O.T. GREEN
1-26-49

C202254

Copied 1-20-49

[illegible]

[illegible]

[illegible]

$CaCO_3$	60.7%
$Ca(OH)_2$	[illegible]
$CaSO_4$	[illegible]
$CaCl_2$	[illegible]
$Mg(OH)_2$	[illegible]
Fe_2O_3	[illegible]
SiO_2	[illegible]
NaCl	.64%
H_2O*	[illegible]
	100.00%

* Above analysis is on basis of dried sample. Original sample contained 42% H_2O

EXHIBIT 11

May 1, 1972

Mr. R. H. Parsons

A. J. Rosso

PAINESVILLE WASTE EFFLUENTS
GRAND RIVER & PICKLE LIQUOR

Per your request, samples were taken of Grand River at Rt. 20 Bridge, Grand River Blow-Off Bridge, Hydrogate Basin Overflow, Blow-Off Liquor before Chrome addition, and 3-day composites were made of the listed steel plants discharging pickle liquor into our West Sewer. The results are listed on the attached data sheets. The standards thus far proposed by the EPA Water Pollution Control Board are as follows:

Lead	.1 mg/l
Cadmium	.002 mg/l
Zinc	1.0 mg/l
Mercury	.0001 mg/l
Cyanide	.025 mg/l
Oil & Grease	10 mg/l
Tot. Discharged Solids	1,000 mg/l
Suspended Solids	20 mg/l
Phenol	.3 mg/l
Total Chrome	.3 mg/l
Ammonia	1.0 mg/l

If there are any questions, please call.

A. J. Rosso

AJR:al
Attach.

cc: D. H. Merrill

EXHIBIT 12

April 6, 1972

A. J. Rosso - Painesville Plant

From V. V. Germano - Concord

Analysis of Water and Pickle Liquor Samples

Project No. 11-01-914-085 File No. D-9148

cc: S. G. Lant - Pville Plant
Central Files

	Grand River Bkt.20 3/23/72 10:05AM	Grand River Blo-off 3/23/72 9:20AM	Hydro Basin 3/23/72 9:00AM	Blow-off Liquor Before Chrome 3/28/72	- Pickle Liquors Repub-lic	New Repub-lic	Youngs-town	J&L	Ana-lyst VVG-7733,
Pb ppm	<0.09	<0.09	<0.09	2.7	1.3	1.1	1.4	1.2	
Sn ppm	<1.0	<1.0	<1.0	36	4.0	4.2	4.8	4.5	105-
Cd ppb	<20	<20	<20	<20	<20	<20	<20	<20	"
Mn ppm	<0.04	<0.04	<0.04	0.22	332	406	330	403	"
Ni ppm	<0.05	<0.05	<0.05	2.2	25	29	22	25	"
Zn ppm	<0.02	<0.02	<0.02	0.20	4.0	4.4	3.8	3.6	"
Cu ppm	<0.03	<0.03	<0.03	0.30	6.2	9.7	4.4	9.7	"
Hg ppb	<0.2	<0.2	0.5	<0.2	<1.1	<0.7	3.2	<1.6	"
NO_3 ppm	0.3	0.3	9.2	<0.1	0.5	<0.1	2.5	<0.1	Bal-7793,
CN ppm	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	BAL-7793-111 JLB-40

Arsenic not run because of hollow cathode lamp failure. New lamp is on order.

V. V. Germano

sp

0102121

Diamond Shamrock - Main Plant Lab. April [illegible], 1972

Painesville Waste Effluents, Grand River, & Pickle Liquor A. J. [illegible]

	1	2	3	4		5	6	7	8
Cl mg/l	504.1	78.1	84,206	28.4	Cl g/l	124.7	133.2	172.4	113.3
Oil & Grease mg/l	---	--	4.5	--	Oil & Grease mg/l	36.5	51.0	25.6	14.5
pH	7.95	7.84	11.45	7.20	pH	0	0	0	0
Hardness as Ca mg/l	---	41.2	31,517	--	Fe g/l	93.0	102.7	119.6	90.6

	1	2	3	4	5	6	7	8
Total Dissolved Solids mg/l 200°C	1,263	256	141,250	61	172,220	186,172	218,372	171,744
Suspended Solids mg/l	93	55	8,486	151	0	0	0	0
NH3 ppm as N ppm	--	0.35	8.0	-	48.7	180.0	113.0	46.3
Phenol ppb	7	4	178	9	95	44	88	58
Cr + 6 mg/l	<.03	.05	<.03	<.03	0	0	0	0
Total Cr mg/l	<.03	.05	<.03	<.03	8.3	9.9	6.2	13.3

Dissolved solids would be the amount contributed after reaction with hydrobasin contents.

1. Hydro Basin Overflow 3/23/72
2. Grand River at Blow Off Bridge 3/23/72
3. Blow Off Liquor 3/23/72
4. Grand River at Rt 20 3/23/72
5. Pickle Liquor Republic Steel 3/30/72
6. Pickle Liquor Jones and Laughlin 3/30/72
7. Pickle Liquor New Republic 3/30/72
8. Youngstown Sheet & Tube 3/30/72

Analyzed By: L. Appell
J. O'Janpa

T. F. Musgrave

C102122

[illegible]	ppb As	ppb Cd	ppb Cr	ppm Fe	ppm Th	ppb Mn	ppb Ni	ppm Zn	ppb Mo	ppm Sn	ppm Al	ppb Co	ppm Mg	ppm Ti	ppm Sb	ppm K
NA = Not Required																
Raw Water #1 - 5/17	<20	<10	<30	0.1	<0.3	<30	<100	0.21	0.6	<1.0	<0.2	<30	10.5	<0.4	<0.2	1.6
" #1 - 5/24	<20	<10	<30	0.4	<0.3	<30	<100	<0.01	0.6	<1.0	<0.2	<30	10.5	<0.4	<0.2	1.7
" #1 - 5/31	<20	<10	<20	0.2	<0.04	<30	<50	0.06	<0.1	<1.0	<0.2	<30	9.1	<0.4	<0.2	1.4
" #1 - 6/7	<20	<10	<20	0.2	<0.04	<30	<50	0.24	<0.1	<1.0	<0.2	<30	9.5	<0.4	<0.2	1.7
" #1 - 6/14	<20	<10	<20	0.2	<0.04	<30	<50	0.11	<0.1	<1.0	<0.2	<30	9.8	<0.4	<0.2	1.4
Waste Tank Overflow #3 - 5/17	<20	300	160 NR	4.3	2.2	310 NR	1100 NR	0.11	0.7	<1 NR	0.6	NR	0.8	<1.0	NR	NR
" " " #3 - 5/24	<20	210	160 NR	11.0	2.2	410 NR	1100 NR	0.06	0.7	<1 NR	1.0	NR	4.0	<1.0	NR	NR
" " " #3 - 5/31	<20	240	150 NR	4.0	2.7	250 NR	1100 NR	0.21	0.6	<1 NR	0.3	NR	0.8	<1.0	NR	NR
" " " #3 - 6/7	<20	<10	150 NR	12.3	<0.04	400 NR	1100 NR	0.09	<0.1	<1 NR	0.7	NR	5.8	<1.0	NR	NR
" " " #3 - 6/14	<20	<10	110 NR	1.1	<0.04	220 NR	1100 NR	0.02	1.0	<1 NR	0.3	NR	0.1	<1.0	NR	NR
Aylco Brass Cartridge #4 - 5/17	<20	<10	<30	0.2	<0.3	<30	<100 NR	0.07	1.4	<1 NR	<0.2	<30	14.2	<0.4	NR	NR
" " " #4 - 5/24	<20	<10	<30	0.5	<0.3	<30	<100 NR	0.55	0.6	<1 NR	<0.2	<30	12.5	<0.4	NR	NR
" " " #4 - 5/31	<20	<10	<20	0.2	<0.04	<30	<50 NR	0.03	0.8	<1 NR	<0.2	<30	13.3	<0.4	NR	NR
" " " #4 - 6/7	<20	<10	<20	0.2	<0.04	<30	<50 NR	0.51	<0.1	<1 NR	<0.2	<30	15.4	<0.4	NR	NR
" " " #4 - 6/14	<20	<10	<20	0.4	<0.04	<30	<50 NR	0.03	0.4	<1 NR	<0.2	<30	12.8	<0.4	NR	NR
West Channel Sewer #5 - 5/17	<20	<10	<50 NR	0.1	<0.3	<50 NR	<100 NR	0.16	0.3	<1 NR	<0.2	NR	NR	<0.4	NR	NR
" " " #5 - 5/24	<20	<10	<50 NR	0.2	<0.3	<50 NR	<100 NR	<.01	0.6	<1 NR	<0.2	NR	NR	<0.4	NR	NR
" " " #5 - 5/31	<20	<10	<50 NR	0.2	<0.04	<50 NR	<50 NR	0.09	1.3	<1 NR	<0.2	NR	NR	<0.4	NR	NR
" " " #5 - 6/7	<20	<10	<50 NR	<0.1	<0.04	<50 NR	<50 NR	0.25	<0.1	<1 NR	<0.2	NR	NR	<0.4	NR	NR
" " " #5 - 6/14	<20	<10	<50 NR	<0.1	<0.04	<50 NR	<50 NR	0.12	<0.1	<1 NR	<0.2	NR	NR	<0.4	NR	NR
North Sewer #6 - 5/17	<20	<10	<30	0.2	<0.3	<50 NR	<100	0.16	0.6	<1.0	<0.2	NR	NR	<0.4	<0.2	3.4
" " " #6 - 5/24	<20	<10	<10	0.5	<0.3	<50 NR	<100	0.03	0.6	<1.0	<0.2	NR	NR	<0.4	<0.2	4.1
" " " #6 - 5/31	<20	<10	<20	0.4	<0.04	<50 NR	<50	0.02	0.3	<1.0	<0.2	NR	NR	<0.4	<0.2	2.7
" " " #6 - 6/7	<20	<10	<20	0.6	<0.04	<50 NR	<50	0.09	<0.1	<1.0	<0.2	NR	NR	<0.4	<0.2	[illegible]
" " " #6 - 6/14	<20	<10	<20	0.4	<0.04	<50 NR	<50	0.09	<0.1	<1.0	<0.2	NR	NR	<0.4	<0.2	[illegible]
Coke Steel Mills #2 - 5/17	NR	<10	40	1.9	<0.3	60	<100	0.58	6.6	<1.0	NR	NR	NR	NR	NR	NR
Results NO longer Required #2 - 5/24	NR	<10	<30	4.0	<0.3	140	<100	0.20	3.9	<1.0	↓	↓	↓	↓	↓	↓
#2 - 5/31	NR	<10	<20	3.2	<0.04	210	230	0.11	14.7	<1.0	↓	↓	↓	↓	↓	↓
#2 - 6/7	NR	<10	<20	7.8	<0.04	90	<50	0.52	2.1	<1.0	↓	↓	↓	↓	↓	↓
#2 - 6/14	NR	<10	<20	4.8	<0.04	200	<50	0.14	10.1	<1.0	↓	↓	↓	↓	↓	↓

C102124

APRIL 1972

[illegible]			
[illegible]			
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]	6.3	[illegible]	[illegible]
[illegible]			
Pounds per month: Cr^{+6}		[illegible]	
Total Cr		[illegible]	
Holding Pond Flow Plus Dust Power Plus to Treatment Tank:			
Number of days sampled		21	
Flow, G.P.D.		[illegible]	
[illegible]	-	-	-
Cr^{+6} mg/l	4,926	[illegible]	1,083
Total Cr mg/l	[illegible]	[illegible]	[illegible]
Pounds per month: Cr^{+6}		[illegible]	
Total Cr		[illegible]	
Treatment Tank Effluent to Waste Lake.			
Number of days sampled		21	
Flow, G.P.D.		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]
Cr^{+6} mg/l	[illegible]	[illegible]	[illegible]
Total Cr mg/l	4,926	[illegible]	1,083
Pounds per month: Cr^{+6}		[illegible]	
Total Cr		[illegible]	
Pounds of SO_2 Used in Reduction		0	-
Other Reducing Agent		Pickle Liquor	
[illegible] Efficiency		[illegible]	
Waste Lake Effluent to Grand River:			
Number of days sampled			
Flow, G.P.D.		Waste Lake Not Overflowing	
[illegible]			
Cr^{+6} mg/l			
Total Cr mg/l			
Pounds per month: Cr^{+6}			
Total Cr			
Overall Chromium Removal:			

C102127

[illegible]

[illegible]

[illegible] Plant West [illegible] Flow
to [illegible] River:

Number of days sampled			
Flow, G.P.D.			
pH			
Cr^{+6} mg/l			
Total Cr mg/l			
[illegible] per month: Cr^{+6}			
Total Cr			

[illegible] April 5, [illegible]

Grand River (St. Clair Bridge)

Number of daily grab samples		18	
pH	7.3	7.9	8.7
Cr^{+6} mg/l	0.31	0.033	0.03
Total Cr mg/l	0.31	[illegible]	[illegible]
Cl mg/l	[illegible]	[illegible]	[illegible]
Hardness mg/l	[illegible]	337	148

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MARCH 1972

Chrome Plant East Sewer Flow to Treatment Tank:			
Number of days sampled		[illegible]	
Flow, G.P.D.		[illegible]	
pH	[illegible]	[illegible]	[illegible]
Cr^{+6} mg/l	[illegible]	[illegible]	
Total Cr mg/l	[illegible]	[illegible]	[illegible]
Pounds per month: Cr^{+6}		[illegible]	
Total Cr		[illegible]	
Building Tank Flow Plus East Sewer Flow to Treatment Tank:			
Number of days sampled		27	
Flow, G.P.D.		[illegible]	
pH	-	-	-
Cr^{+6} mg/l	[illegible]	1,733	979
Total Cr mg/l	[illegible]	[illegible]	[illegible]
Pounds per month: Cr^{+6}		11,341	
Total Cr		11,341	
Treatment Tank Effluent to Waste Lake:			
Number of days sampled		27	
Flow, G.P.D.		[illegible]	
pH	[illegible]	[illegible]	[illegible]
Cr^{+6} mg/l	[illegible]	[illegible]	[illegible]
Total Cr mg/l	3,770	1,733	979
Pounds per month: Cr^{+6}		[illegible]	
Total Cr		11,341	
Pounds of SO_2 Used in Reduction		0	
Other Reducing Agent		Pickle Liquor	
Hexavalent Chrome Reduction Efficiency		[illegible]	
Waste Lake Effluent to Grand River:			
Number of days sampled			
Flow, G.P.D.			
pH			
Cr^{+6} mg/l	Construction work on dike.		
Total Cr mg/l			
Pounds per month: Cr^{+6}			
Total Cr			
Overall Chromium Removal:			

C102129

[illegible]

	[illegible]	[illegible]	[illegible]
Chrome Plant West Sewer Flow to Grand River:			
Number of days sampled			
Flow, G.P.D.		[illegible]	
[illegible]		[illegible]	
Total [illegible] mg/l	[illegible]	7.8	7.7
Pounds per month: Cr^{+6}	53.1	[illegible]	3.6
Total Cr	55.1	17.1	3.4
		[illegible]	
		[illegible]	
Grand River (St. Clair Bridge)			
Number of daily grab samples		[illegible]	
pH		[illegible]	
[illegible] mg/l	3.4	[illegible]	
[illegible] mg/l	[illegible]	0.049	
Cl mg/l	0.31	0.102	0.01
Hardness mg/l	497	[illegible]	0.03
	470	[illegible]	[illegible]
		[illegible]	[illegible]

C102130

[illegible]

[illegible]

Chrome Plant East Sewer Flow to Treatment Station:			
Number of days sampled		23	
Flow, G.P.D.		[illegible]	
pH	[illegible]	[illegible]	
Cr^{+6} mg/l	[illegible]	[illegible]	[illegible]
Total Cr mg/l	[illegible]	[illegible]	[illegible]
Pounds per month: Cr^{+6}		[illegible]	
Total Cr		[illegible]	
Building Food Plant Plus East Sewer Flow to Treatment Tank:			
Number of days sampled		[illegible]	
Flow, G.P.D.		[illegible]	
pH	-	-	-
Cr^{+6} mg/l	3,204	1,307	534
Total Cr mg/l	3,204	1,307	534
Pounds per month: Cr^{+6}		[illegible]	
Total Cr		[illegible]	
Treatment Tank Effluent to Waste Lake:			
Number of days sampled		23	
Flow, G.P.D.		[illegible]	
pH	2.6	2.2	2.1
Cr^{+6} mg/l	142	5	0
Total Cr mg/l	3,204	1,307	534
Pounds per month: Cr^{+6}		67	
Total Cr		[illegible]	
Pounds of SO. Used in Reduction		0	
Other Reducing Agent		Pickle Liquor	
Hexavalent Chrome Reduction Efficiency		97.7%	

Waste Lake Effluent to Grand River:

Number of days sampled		
Flow, G.P.D.		
pH	Construction work on dike	
Cr^{+6} mg/l		
Total Cr mg/l		
Pounds per month: Cr^{+6}		
Total Cr		

[illegible]

C102131

-3-

February, 1972

Chrome Concentrations

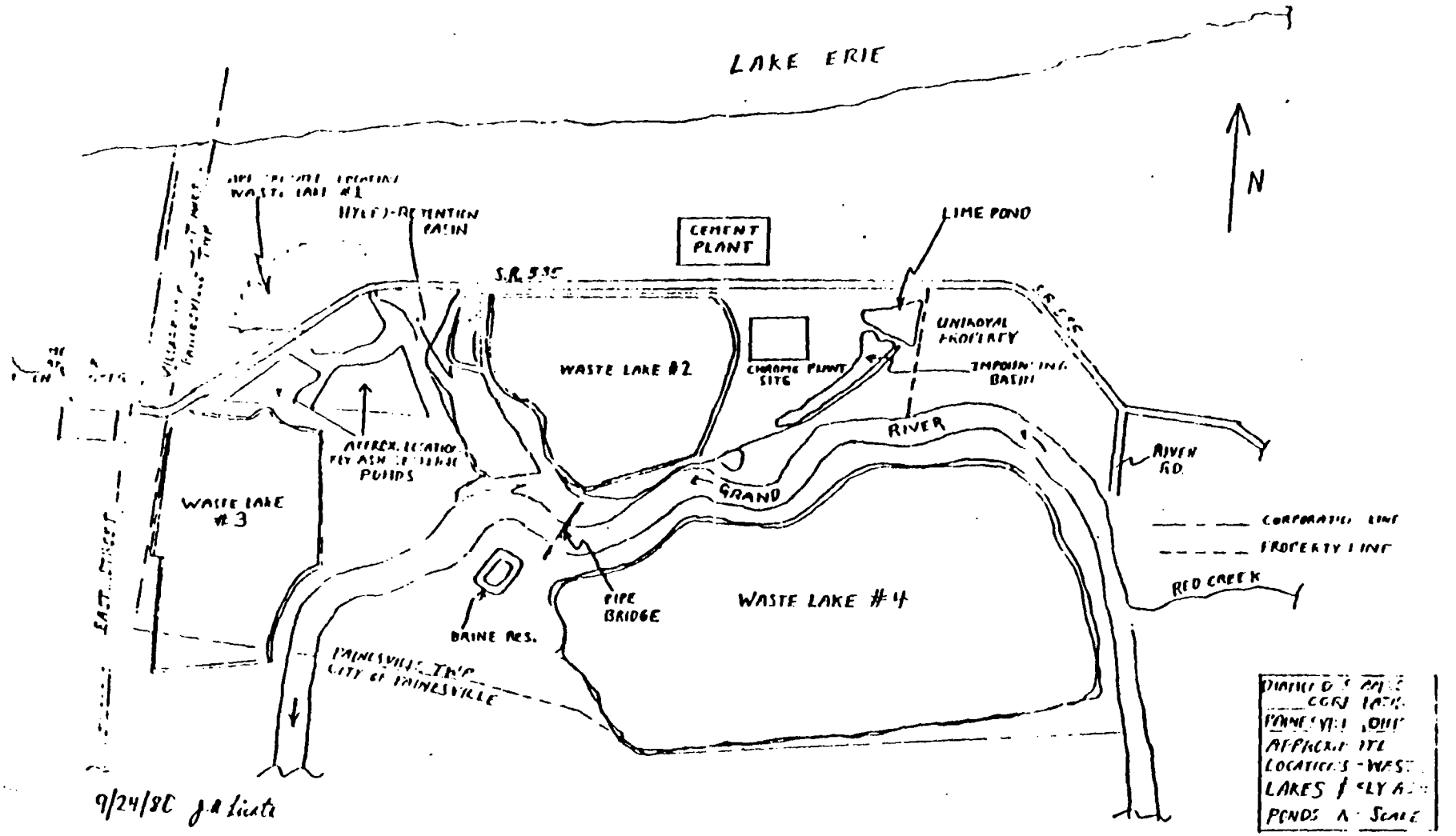
in

[illegible]

	Max.	Ave.	Min.
Chrome Plant West Sewer Flow to Grand River:			
Number of days sampled		23	
Flow, G.P.D.		6,444,529	
pH	8.1	[illegible]	7.3
Cr^{+6} mg/l	33.2	11.4	5.3
Total Cr mg/l	56.2	11.4	5.3
Pounds per month: Cr^{+6}		12,238	
Total Cr		12,238	
Grand River (St. Clair Bridge)			
Number of daily grab samples		19	
pH	8.7	7.2	7.7
Cr^{+6} mg/l	0.17	[illegible]	[illegible]
Total Cr mg/l	[illegible]	[illegible]	0.10
Cl mg/l	1,548	1,079	660
Hardness mg/l	1,335	953	[illegible]

C102132

EXHIBIT 13


LAKE ERIE
N
CEMENT PLANT
LIME POND
S.R. 535
WASTE LAKE #2
CHROME PLANT SITE
UNIROYAL PROPERTY
IMPOUNDING BASIN
RIVER
GRAND
RIVER RD.
WASTE LAKE #3
PIPE BRIDGE
WASTE LAKE #4
BRINE RES.
RED CREEK
CORPORATION LINE
PROPERTY LINE
PAINESVILLE TWP
CITY OF PAINESVILLE
9/24/80