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Battle Creek Groundwater Survey

March 1982

ecology and environment, inc.

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Battle Creek Groundwater Survey

March 1982

# ERRATA PAGE TO BATTLE CREEK GROUNDWATER STUDY (TDD#5-8201-1)

## Please remove and insert the following pages:

- Remove the 4th page entitled Drilling Protocol and insert the new insert page.
- 2. Remove the 7th page entitled Battle Creek....Field Data and insert the new insert page.
- 3. Insert the new title page behind 1st green sheet entitled Daily Summary CERCIA Cleanup.
- 4. Insert the remaining Well Survey Data for Wells 10-16 after section on Test Well Elevations page 8.
- 5. Remove the page entitled Verona Pumping Station Monday, March 1, 1982, and insert the new page. 2nd page before 2nd green divider.
- 6. Remove the 1st appendix title page and insert the new page Appendix A.
- 7. Remove the 2nd appendix title page and insert the new page Appendix B.
- 8. Remove the 3rd appendix title page and insert the new page Appendix C.
- 9. Remove the 4th appendix title page and insert the new page Appendix D.
- 10. Remove the 5th appendix title page and insert the new page Appendix E.
- 11. Remove the 6th appendix title page and insert the new page Appendix F.
- 12. Remove the 7th appendix title page and insert the new page Appendix G.
- 13. Remove the 8th appendix title page and insert the new page Appendix H.
- 14. Remove the 9th appendix title page and insert the new page Appendix I.
- 15. Add the Appendix Table before 1st green divider.

#### **EPA PROJECT**

#### ECOLOGY AND ENVIRONMENT, INC.

#### MEMORANDUM: REGION V

COST CENTER EP151-5

TO: Mr. Robert Bowden

FROM: Technical Assistance Team

VIA: Mr. Scott McCone

SUBJECT: Battle Creek Groundwater Study (TDD# 5-8201-1)

DATE: March 29, 1982

#### COMMENTS:

In September of 1981 the Michigan Department of Public Health detected the presence of chlorinated hydrocarbons in residential wells in Battle Creek, Michigan. The chlorinated hydrocarbons were also traced to the municipal well field at the Verona Pumping Station. Chemicals found in the municipal wells included:

- 1). Trichloroethane Up to 99 ppb.
- 2). CIS 1,2-dichloroethane Up to 77 ppb.
- 3). Trichloroethene Up to 34 ppb.
- 4). Perchloroethane Up to 44 ppb.
- 5). 1,1-Dichloroethane Up to 12 ppb.
- 6). 1,2-Dichloroethane Up to 3 ppb.
- 7). 1,1-Dichloroethane Up to 5 ppb.

Several private and industrial wells up gradient from the Verona Pumping Station are contaminated (see map) indicating a large area of contamination.

The City of Battle Creek Verona Pumping Station has thirty wells. Ten of these wells are no longer in service because of contamination. The population served by this field is approximately 40,000.

In January 1982, the U.S. EPA requested assistance from the TAT.

The TAT prepared a Groundwater Study to identify potential sources of contamination. A subcontractor was hired to install 16 monitoring wells. Samples were collected from the wells and shipped to a U.S.

EPA contract lab.

Between the period of February 21, 1982 through March 17, 1982 members of the TAT monitored the daily drilling activities conducted by Soil Testing Services of Michigan (See Daily CERCELA Summaries). During this period, the TAT coordinated the drilling activities, worked in conjunction with MDNR and MDPH personnel in determining the location of the monitoring wells (see map). The TAT collected, shipped and insured chain of custody for the water samples.

In addition soil samples were collected and shipped to contract labs. Water levels, temperature, and conductivity measurements were made at each well site.

Additional TAT personnel inspected industrial facilities in a effort to determine the potential source of contamination. TAT members reviewed citizen complaints and analyzed aerial photographs to determine the location of several old dump sites.

The groundwater and soil results will be forward to the U.S. EPA and the MDNR. The suspected sources and past well contamination information have been plotted in the enclosed report. Together, the analytical results and the industrial background information will provide the appropriate agencies with sufficient information to eliminate a number of the suspected sources.

## RECOMMENDATIONS

- MDPH should continue to sample wells to further define the contaminated area. Depths of the well should be included.
- 2). MDNR should obtain samples of the surface water and sediments of the Lagoon in the Grand Trunk Railyard. Samples of the surface water from the drainage area that flows through Grand Trunk property should be taken.
- 3). MDNR should pursue inspections of local industrial facilities to identify users of chlorinated hydrocarbons.
- 4). A groundwater model of the Battle Creek area should be developed to determine the movement of the groundwater. The USGS has proposed a groundwater survey of the area.

5). Different methods of treatment of the contaminated groundwater should be studied, to determine the most cost effective method of treatment.

Tom DeFouw

John Dourjalian

Scott McCone

## DRILLING PROTOCOL

The following procedure was used by Soil Testing Service (STS) personnel to install monitoring wells in Battle Creek, Michigan.

- A). All equipment was washed using soap and water.

  Then rinsed with water, the final rinse was a Menthanol rinse.
- B). A solid stem Auger was used to open hole to 40'. Auger was put on in 5' sections.
- C). The Auger was removed and casing was drove down to bedrock.
- D). A drill with bit was used in side casing to drill down to 40'. A water wash was used to remove course, medium and fine particles.
- E). Galvinized well casing washed and rinse with Methanol then attached to a 5' Johnson screen.
- F). The well was put into casing.
- G). 4 feet of pea gravel was added between well and casing.
- H). 2 feet of Bentinite pellets were added between casing and well.
- I). The casing was removed.
- J). The drill hole was back filled with cement grout.
- K). The well caps and protective casing were installed.
- L). The well was developed at least 14 hours using a surge pump.
- M). The surge pump was removed.
- N). The protective cap was screwed on and locked.

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- C). The Auger was removed and casing was drove down to bedrock.
- D). A drill with bit was used in side casing to drill down to 40'. A water wash was used to remove course, medium and fine particles.
- E). Galvinized well casing washed and rinse with Methanol than attached to a 5' Johnson screen.
- F). The well was put into casing.
- G). 4 feet of pea gravel was added between well and casing.
- H). 2 feet of Bentinite pellets were added between casing and well.
- The casing was removed.
- J). The drill hele was back filled with cement grout.
- K). The well caps and protective casing was installed.
- L). The well was developed at least 14 hours vsing a surge pump.
- M,. The surge pump was removed.
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# GROUNDWATER STUDY BATTLE CREEK, MICHIGAN

AÜeged Sources of Contamination:

1). Thomas Solvents - (See Product List)

Southeast corner of Raymond Road and Emmet Street

- 1-A). Old storage tanks
- 1-B). Facility
- 1-C). Possible facility
- 2). Grand Trunk Western Railroad Company Raymond Road
  - 2-A). West yard storage tank
  - 2-B). East yard
  - 2-C). Old round house area
  - 2-D). Treatment Lagoon
  - 2-E). Old dump site
  - 2-F). Old car cleaning area
- 3). Rieth Riley Construction Company Raymond Road
  - A). Cleaning Pit
- 4). Lewis Welded Rail Plant
- 5). Old Dump Site with Drums Along Jameison Road
- 6). <u>Kelloggs Company</u>
  - A). Old dump site on Edison Street
  - B). Old dump site under Kell-Pack facility
- 7). Quad-L-Corporation (Metal Fabrication) MDNR Investigation

Two buried tanks from old facility Dry cleaning facility - floor drains

8). Polymer Tech - Polyurethane Foam

Solvents flush after product mix Waste hauled by hauler

- 9). Raymond Road Landfill MDNR Investigation
- 10). Battle Creek Foundary Company Raymond Road and Jameison Road
- 11). Anderson Oil Company Pickford Street

- 12). Consumers Power Company Edison Street
- 13). Grand Trunk Western Railroad Credit Union Raymond Road

Battle Creek, Michigan Groundwater Survey Field Data

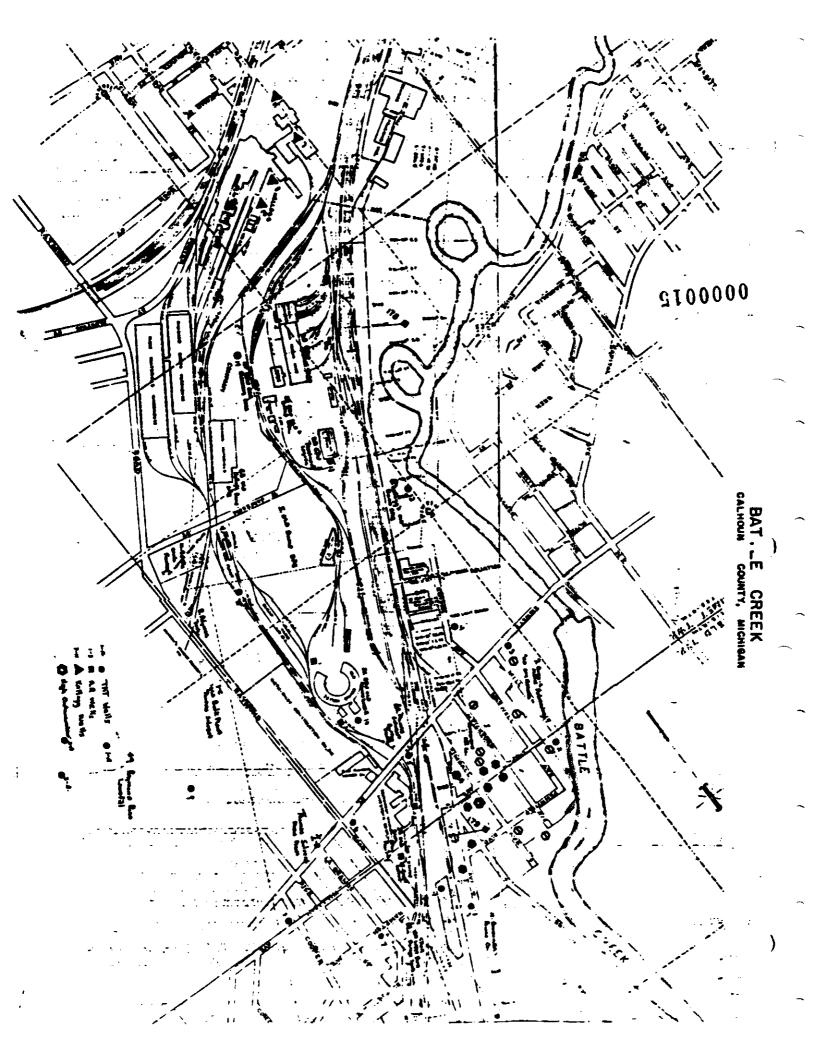
Well No.	Date	WL	Conductivity	рН	Temperature
1	2/25/82	21'.7"	530	7.0	9 <sup>0</sup> C
2	3/1/82	13'.10"	260	7.1	7 <sup>0</sup> C
3	3/3/82	10'.11"	900	7.05	10 <sup>0</sup> C
4	2/26/82	11'.6"	575	6.2	NR*
5	3/1/82	18'.8"	600	NR*	9 <sup>0</sup> C
6	3/2/82	19'.2⅓"	328	7.8	8 <sup>0</sup> C
7	2/22/82	24'.4"	348	6.9	10°C
8	2/23/82	23'.7"	600	7.0	6 <sup>0</sup> C
9	2/24/82	23'.2"	570	6.2	7 <sup>0</sup> C
10	3/8/82	21'.7"	500	7.5	10 <sup>0</sup> C
11	3/15/82	20'.4"	375	NR*	9 <sup>0</sup> C
12	3/15/82	11'.6"	325	NR*	NR*
13	3/8/82	13'.1"	550	7.2	6 <sup>0</sup> C
14	3/12/82	18'.2"	625	7.2	9 <sup>0</sup> C
15	3/11/82	5'.4"**	375	NR*	8°C
16	3/7/82	13'.1"	550	7.0	7 <sup>0</sup> C

<sup>\*</sup>NR - Not Recorded

<sup>\*\*</sup>Well #15 was clogged the water level reading is questionable

Battle Creek, Michigan Groundwater Survey
Field Data

Well No.	Date	WL	Conductivity	рН	Temperature
		<u> </u>		1	
1	2/25/82	21 ' . 7"	470	NR*	10 <sup>0</sup> C
2	3/1/82	73'.10"	260	7.1	7 <sup>0</sup> C
3	3/3/82	ון גלי 10	900	7.05	16 <sup>0</sup> C
4	2/26/82	11'.6	600	6.8	12 <sup>0</sup> C
5	3/1/82	18'.8"	NR*	NR*	9 <sup>0</sup> C
6 .	3/2/82	19'.2½"	530	7.0	9 <sup>0</sup> C
7	2/22/82	24'.45"	346	6.9	10 <sup>0</sup> C
8	2/23/82	23'.7 3/4"	600	7.0	6 <sup>0</sup> C
9	2/24/82	23'.2"	570	6.2	7 <sup>0</sup> C
10	3/8/82	21'.7"	500	7.5	10 <sup>0</sup> C
11	3/15/82	20' 🔏"	375	NR*	9 <sup>0</sup> C
12	3/15/82	6. ۱/۲	325	NR*	12 <sup>0</sup> C
13	3/8/82	/ 13'.1"	550	7.2	6 <sup>O</sup> C
14	3/12/82	18'.2"	700	7.2	13 <sup>0</sup> C
15	3/11/82	5'.4"	375	NR*	8 <sup>0</sup> C
16	3/7/82	13'.1"	550	1 20	17 <sup>0</sup> C
*NR-Not Record	led				
I					



# PEST WELL ELEVATIONS

HELL NO!

Top 4"Casing - 845.41 Top 2" Pipe - 845.40 Ciound EKV. - 842.85

WELL NOE N. END OF MILL ST ESING OF ROMO Top 4"Cosing - 838.78
Top 2" Pipe - 838.69
Ground Elev. - 836.38

Well Nº3 N. SICE CE EMPRETE ST., JUCK KET OF MILL ST. Top 4" Cosing - 836.33 Top 2" Pice - 836.30 Ground Elev. 833.43

Well Nº 4 South ECKSON @ EEND Top 4" Cosing - 838.32 Top 2" Pipe - 838.34 Ground Elev. - 835.47

Nell N.25 N. SIDE OF ETHILETT ST @ STITE. Top 4" Cocine - 845.83 Top 2 : Pipe - 845.73 Cround Elev - 843.28

Well JEG WEIDE STE MATHEMAND AVE, JUST N. OF ENWIETT Top 2" Cosing - 848.67 Top 2" Fige - 848.62 Grownd Elev. - 846.45

LE CORMER LA GRANGE AVE. E HAMIOTON AVENNE Top 4" Cosing - 847.74

Top 2" Pipe - 847.84

Ground Elev. - 845.84

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Agenthe Burke

10.228 - 1013 601. 601. 10.5202. 10.520

31.128 - 4515 bnuond 20.538 - 9919 "5 95T 21.539 - 4515 bnuond 1/16/1 1/29 1/16/1 1/29 1/16/1 1/29

> 25/00) 75/71/4 \$ 25/00) 75/70) 75 8 7/8/1 1/3/4

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## CITIZEN CONTACTS PROPERTY OWNERS

February 22, 1982

Roger Golyar (616)963-0184 238 and 240 LaGrange Road and Hampton

Complained of property damage.

February 23, 1982

Beverly Rash (616)965-6623

12 Cooper Street
Complained about snow removal

\*Both property owners informed TAT members that they were not notified by Penfield Township officials about the drilling.

February 24, 1982

W.A. Lahn (Bill) (616)962-9345/965-6202

46 Corcoran Street

Talked about property and contaminated wells.

February 24, 1982

Russell E. Keyes 114 Culbertson

Wanted Wells tested.

Trouble with oil in water.

## WELL KEYS

The keys to the protective caps on the Battle Creek wells were distributed to the following people: Bill Iverson  ${\tt MDNR}$ 

Garth Alaskson - MDNR

Roger Jones - MDNR

Tom DeFouw - EPA Region V TAT

John Dourjalian - EPA Region V TAT

Steve Ostrodka - EPA Region V

Ross Power's - EPA Region V

Roger Rotzenberg - Soil Testing Service, Lansing

.

The key number is 3386.

Weather: Clear Sky, 38°F  Date: February 22, 198 Time Commenced Work 0800 Time Completed Work 1730
Facility: Battle Creek Groundwater Study
Contractor(s): Soil Testing Service of Michigan, Inc. (517)321-4964
- 3340 Ranger Road, Lansing, Michigan 48906
Type of Personnel: 0800 - 1730 - (2) Drillers, (1) Supervisor, (Subcontractor)
Equipment Utilized: 1-Drill Rig, 1-LowBoy, 1-Tractor, 2-Trucks, 40' Auger.
40' Casing, 40' Drill Stem, Wash Tank, Steel Horses, Stainless Steel Well Casing-
and Screen, Pea Gravel, Bentonite Pellets, Cement, and Lock. Contractor provided
sample bottles labels, and locks
Scope of Work Completed: Steam cleaning rig. Completed drilling of Hole #7.  All well sites are staked and cleared for drilling.
Comments: Work progressed faster than expected. Good cooperation with drillers
and city officials for site preparation and crowd control. Drilling tractor
makes a large track on site possible damaging property. Property owners complaine
City officials stated they would handle problems. Photographers from Enquirer
and Channel 3 at Site.
Future Plans: Finish sampling of Hole #7, start drilling hole #8.

Weather: Cloudy skies, 40°F.  Date: February 23, 1982Time Commenced Work 0730 Time Completed Work 1700
Facility: Rattle Creek Groundwater Study
Contractor(s): Soil Testing Service of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517-321-4694
Type of Personnel: 0730 - 1700 - (2) Drillers
Equipment Utilized: (1) Drill Rig. 1-LowBoy, 1-Tractor, 1-Truck, 40' Auger,
40' Casing, Wash Tank, Steel Hoses, Stainless Steel Well Casing and Screens,
Pea Gravel, Bentonite, Pellets and Cement Lock, Surge Ball.
Scope of Work Completed: Developed and sampled well #7, completed drilling
Hole #8. Samples were placed in Verona Pumping Station refrigerator. A custody Seal
was placed on refrigerator. Groundwater temperature, pH, and Conductivity were
measured in field.
Comments: Work progressed as well as expected. Some difficulty installing Well #8,
hole kept collapsing. Drillers used a small amount of Bentenite clay to keep
hole to reinforce well sides and prevent hole callapsing. Mr. Turner from Raymond
Road Landfill informed us of possible TCE sources. Channel 41 TV crew at site.
Future Plans: Finish sampling well #8 and start drilling Hole #9. Developing
of Well #8 will take a longer time to wash bentenite out of hole. Possible
on site visit to Raymond Road Landfill.

Date: February 24, 1982Time Commenced Work 0730 Weather: Lite snow, 27°F Time Completed Work 1730
Facility: Battle Creek, Michigan Groundwater Study
Contractor(s): Soil Testing Service of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517)373-8147
Type of Personnel: 0730 = 1730 (2)Drillers
Equipment Utilized: 1-Drill Rig, 40' Casing, 40' Drill, 40' Auger, 40' of Stainless Steel Casing, 5' Screen, 1-Truck, Tractor and LowBoy, Pea Gravel, Bentonite,
Surge Ball, Wash Tank.
Scope of Work Completed: Developed and sampled Well #8, Installed Well #9,  Developed and sampled Well #9, started installation of Well #1. All samples  stored in Verona Pumping Station refrigerator.
Comments: Crew work extremely well considering cold weather. Well #9 was installed quickly. No callapse of side walls. Began augering at Well #1. Several citizens informed TAT members of well problems and possible sources in area.
Channel 41 was on scene filming drilling. Mr. Steve Ostrodka was on site.
Future Plans: <u>Finish insta lling Well #1, develope and sample start installing</u> Well #4.

Date: February 25, 1987 ime Commenced Work 0730 Time Completed Work 1700
Facility: <u>Battle Creek, Michigan - Groundwater Study</u>
Contractor(s): Soil Testing Services of Michigan, Inc.
. 3340 Ranger Road - Lansing, Michigan 48906 (517) 321-4964
Type of Personnel: 0730 - 1700 - (2) Drillers
Equipment Utilized: Same equipment as on February 23, 1982.
Scope of Work Completed: Developed and sampled Well #1. Started installation of
Well #4. Samples were stored in Verona Pumping Station refrigerator. 3 VOA samples were frozen #1001. 1003 from Wells #7. 8 and 9 respectively. Samples were
shipped via Federal Express to Accurex Corp.
Comments: Well#4 was developed for 3 hours. The last hour of developing the well
the well color remained a cloudy white. Installation of Well #4 was in a medium traffic area. Samples were shipped to Accurex, Corporation/Ecology and Environment
Division, 405 Clyde Avenue, Mounhainview, CA 94042. Soil Testing Service will pay
for shipping. VIAR CASE # 891.
Future Plans: Continue installlation of Well #4, develope and sample #4. Clean
all equipment for Monday, March 1, 1982. Sample #1000 was a blank sample prepared
From distilled water at the Verona Pumping Station.

weather 20 °F. clear skies  Date: February 26, 198 Time Commenced Work 0730 Time Completed Work 1700
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 0730 - 1700 (2)Drillers
Equipment Utilized: 1-Drill Rig. 1-LowBoy, 1-Tractor, 1-Truck, 40' Auger,
40' Casing, 40' Drill Stem, Wash Tank, Steel Horses, Galvanized Well Casing,
5' Stainless Steel Screen, Pea Gravel, Bentonite Pellets, Cement Grout,
Protective Casing, Locks.
Scope of Work Completed: Completed drilling Well #4, developed and smapled well.  Sample #4 was stored in the Verona Pumping Station refrigerator. The refrigerator was sealed with custordy tags.
Comments: Work progressed at expected rate. The well is in a medium traffic area and has barricades around it.
Future Plans: Start drilling on Monday, March 1, 1982 with Well #2.

Date: March 1, 1982 Time Commenced Work 0730 Weather: Partly cloudy, 150F
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
- 3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 0730 - 1700 2-Drillers
Equipment Utilized: I-Drill Rig, 1-LowBoy, 1-Tractor, 1-Truck, 40' Auger, 40' Casing
40' Drill Stem, Wash tank, Steel Horses, Galvanized Well Casing, 5' Stainless Steel
Screen, Pea Gravel, Bentonite Pellets, Cement Grout, Protective Casing Locks
Scope of Work Completed: Completed drilling of well site #2. Moved to well
site #5. A meeting was held at Verona Pumping Station to discuss project.
Samples were not to be obtained with surge block. TAT members used bailers.
Mr. Dourjalian decided not to sample wells until remaining TAT members arrived.
Comments: Work progressed at expected rate. Drillers were very cooperative.
Move well site #2 on private property. Drillers lost 15' of Auger. No samples
were taken because of a difference of opinion on sampling precedures.
Future Plans: Start drilling of well site #5 on Tuesday. Samples would be
obtained with copper bailer as directed by MDNR rather than by surge pump.

Weather: Cloudy skies, 25 <sup>0</sup> F  Date: <u>March 2, 1982</u> Time Commenced Work <u>0730</u> Time Completed Work <u>1830</u>
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 0730 - 1830 - 2-DRILLERS
Equipment Utilized: 1-Drill Rig, 1-LowBoy, 1-Tractor, 1-Truck, 40' Augar, 40' Casing, Wash Tank, Steel Horses, Galvanized Well Casing, 5' Stainless Steel Screen (2)
Pea Gravel, Bentonite Pellets, Cement Grout.
Scope of Work Completed: Completed well #5 and 6. Drillers moved to Well site
#3. No samples were collected. Mr. Dourjalian picked up Mr. DeFouw at Airport.
Comments: Work progressed faster than expected. Drillers were very cooperative.  No samples were taken.
NO SUMPTES WETE CONCIT.
Future Plans: Start drilling well site #3 on W kinesday.

Weather: Clear skies, 25°F.  Date: March 3, 1982 Time Commenced Work 0730 Time Completed Work 1/30
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
- 3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964
Type of Personnel: <u>0730 - 1730 - 2-Drillers</u>
Equipment Utilized: 1-Drill Rig, 1-LowBoy, 1-Tractor, 1-Truck, 40' Augar, Wash
Tank, Steel Horses, 1-5' Stainless Steel Screen, Pea Gravel, Bentonite Pellets,
Cement Grout
· · · · · · · · · · · · · · · · · · ·
Scope of Work Completed: Completed Well #3. MDNR called Mr. DeFouw requesting
an additional installation of four wells. The project total will be 16 wells.
MDNR requested 3 additional soil samples. SPCC inspection of Grand Trunk Western
Railroad was completed.
Comments: Mr. Powers of U.S. EPA arrived on scene to assist in investigation.
Mr. DeFouw made preparations for funding of additional wells.
Future Plans: Start drilling at Well #16 Thursday. TAT members will conduct
industrial inspections to determine sources of contamination.

Date: March 4, 1982 Time Commenced Work 0730 Weather: Ice and snow, 20°F Time Completed Work 1830
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
- 3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 0730 - 1830 - 2-Drillers
Equipment Utilized: None/Snow Day
Scope of Work Completed: Snow Day; TAT members and driller checked locations of additional wells. Mr. Dourjalian obtained copper bailer form STS in Lansing.
Michigan.
Comments: TAT charged   hour of downtime. TAT members received 1954 aerial
photographs of Battle Creek.
Future Plans: Start Drilling at Well #16.

Date: March 5, 1982 Time Commenced Work 0730 weather 30° F. Clear skie Time Completed Work 1630
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517) 321-4964
Type of Personnel: 0730 - 1630 - 2-Driller
Equipment Utilized: 1-Drill Rig. 1-LowBoy. 1-Tractor. 1-Truck. 40' Augar.  40' Casing, Wash Tank, Steel Horses, Galvanized Well Casing, 1-5' Stainless Steel
Screen, Pea Gravel, Bentonite Pellets, Cement Grout.
Scope of Work Completed: Completed Well #16. Project meeting was held at
Verona Pumping Station. Final well locations were identified (see list of
attendees).
Comments: Work progressed as expected. Drillers were cooperative. MDNR located
sites for additional wells.
Future Plans: Move to Well #10 to set-up drilling

Weather: Clear skies, 15°F.  Date: March 8, 1982 Time Commenced Work 0730 Time Completed Work 1900
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
Type of Personnel: 0730 - 1900 - 2-Drillers
Equipment Utilized: 1-Drill Rig, 1-LowBoy, 1-Tractor, 1-Truck, 40' Augar, 40' - Casing, Wash Tank, Steel Horses, 2-5' Stainless Steel Screens, Pea Gravel,
Products D. 13. c A
<u> </u>
using copper bailer at Well #'s 2. 3. 10. and 6. All samples were stored at the Verona Pumping Station Refrigerator
Comments: Work progressed as expected. Bailer was lost in Well #2 but was
retrieved by drillers. TAT members rebailed all wells to compare with previous samples.
Future Plans: Move to Well #15.

Date: March 9, 1982 Time Commenced Work 0730 Weather 15° F. clear skies
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964.
Type of Personnel: 0730 - 1730 - 2-Drillers.
Equipment Utilized: 1-Drill Rig, 1-LowBoy, 1-Tractor, 40' Augar, 1-Truck.
40' Casing, Wash tank, 1-Stainless Steel Screen, Steel Horses, Pea Gravel,
Bentonite Pellets, Cement.
<u> </u>
Scope of Work Completed: Rig broke down while developing Well #15. Well #15 did
not develop properly. Mr. McCone of TAT in Chicago arrived in Battle Creek for
inspections. Mr. McCone helped bail wells. Sampling of wells #'s 1, 5, 7, 9,
and 8 wer sampled and shipped with remaining samples to contract lab.
Comments: Rig broke dwon. Development of well was slow, not developing properly.
At 13:30 Drill Rig became inoperable. TAT did not pay for downtime.
Future Plans: Complete Well #15. Finish sampling and industrial inspections.

Date: March 10, 1982 Time Commenced Work 0730 Time Completed Work 1430
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 2-Drillers
Equipment Utilized: 1-Drill Rig, 1-LowBoy, 1-Tractor, 1-Truck  "Rig is still inopertatable".
Scope of Work Completed: Repair Drill Rig. TAT members attended Kellogg meeting and received facility map of Grand Trunk Railyard. All samples were shipped
via Federal Express to contract Labs.
Comments: TAT not being charged.
Future Plans: Complete Well #15.

Date: March 11, 1982 Time Commenced Work 0430 Time Completed Work 1630
Facility: Battle Creek, Michigan, - Groundwater Study
Contractor(s): Soil Testing Service of Michigan, Inc.
3340 Ranger Road, Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 0730 - 1630 - 2-Drillers
Equipment Utilized: 1-Drill Rig, 1-LowBoy, 1-Tractor, 1-Truck, 40' of Auger,
40' of Casing, 40' of Drill Stem, Wash Tank, Steel Horses, Stainless Steel
Well Casing and Screen, Pea Gravel, Bentonite Pellets, Cement, Protective Casing
and Lock.
·
Scope of Work Completed: <u>Drillers completed repair work on Rig. Drillers</u>
finished developing Well #15. The well did not develope properly.
Comments: TAT was not charged for downtime due to Drill Rig breakdown. Sampling
should be completed by March 15, 1982.
Future Plans: Finish remaining wells.

Weather: Partly cloudy, temperature 15°F  Date: March 12, 1982 Time Commenced Work 0730 Time Completed Work 1630
Facility: <u>Rattle Creek, Michigan - Groundwater Study</u>
Contractor(s): Soil Testing Services of Michigan, Inc.
3340 Ranger Road Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 0730 - 1600 - 2-Drillers
Equipment Utilized: _I-Drill Rig. l-LowBoy. l-Tractor. l-Truck. 40' Augar,
40' Casing, Wash Tank, Steel Horses, Galvanized Well Cosing, 1-5' Stainless
Steel & teen, Pea Gravel, Bentonite Pellets, Cement.
Scope of Work Completed: Moved from Well #15 to Well #14. Well #15 was not
developing properly. Completed Well #14 drilling. Sample was placed in
Verona Pumping Station refrigerator.
Comments: Work progressed as expected.
Future Plans: Move to Well #12 on Monday.

Date: March 15, 1982 Time Commenced Work 0730 Time Completed Work 1900
Facility: Battle Creek, Michigan - Groundwater Study
Contractor(s): Soil Testing Services of Michigan, Inc.
3340 Ranger Road, - Lansing, Michigan 48906 (517)321-4964
Type of Personnel: 0730 - 1900 - 2-Drillers
Equipment Utilized: 1-Drill Rig, 1-Lowboy, 1-Tractor, 1-Truck, 40' Augar,
40' Casing, Wash Tank, Steel Horses, Galvanized Well Casing, 2-Stainless Steel
Screens, Pea Gravel, Bentonite Pellets, Cement.
<u> </u>
Scope of Work Completed: Completed wells #13 and #13. Soil samples were taken
from Wells #13, #11, and #6. TAT received samples from Roger Jones taken from
the Raymond Road Landfill. Well #15 was clogged and a city pump was used to
clear well screen.
Comments: Work progress faster than expected. Drillers were very cooperative.
Maybe problems with future sampling of Well #15.
Future Plans: Complete Well #II. Clean equipment.
dedic 11aus

Date: March 16.	1982 Time	Commenced Work	0730		F. cloudy ed Work 1300
			•		
:					
		er Road. Lansing		48906 (517)3	21-4964
Type of Personn	el: <u>0730 -</u>	1300 - 2-Drille	rs	··· <u>-</u> -	
			<del></del>		
Equipment Utili	zed: <u>See N</u>	larch 15 equipme	nt.		
				· · · · · · · · · · · · · · · · · · ·	
	·				
Scope of Work C	ompleted:	Development of	Well #11.	Steam cleani	na of Ria.
Obtained water	• •	- <b>-</b>			
		UII WELL BIZ, WE	ti wii, di	u weil 915. to	ok water
levels of all	wells.			<u> </u>	
	<del></del>		<del></del>	<del></del>	
Comments: Work	completed	as expected. S	amples bro	ught back to C	hicago to be
shipped out Fed	deral Expre	ss on Wednesday	March 17.	1982, in the	morning.
			<del>-</del>		· · · · · · · · · · · · · · · · · · ·
· · · · · · · · · · · · · · · · · · ·				<del></del>	
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Future Plans:	City should	go back and ge	t well ele	vations for We	11s # 10 - 16.
<del></del>					

# VERONA PUMPING STATION Monday - March 1, 1982

NAME	ORGANIZATION	PHONE
Joe Lovato	Groundwater Quality - MDPH	(517) 373-8147
Russell Schueler	City of Battle Creek	(616) 966-3407
Laverne Serne	City of Battle Creek	(616) 966-3407
John Heppeard	Calhoun County Health Dept.	( )
Don Keech	Groundwater Quality - MOPH	(517) 373-8147
Rick Wirsing	Water Supply - MDPH	(517) 373–1376
Larry A. Osborne	City of Battle Creek	(616) 966-3421
Claudia Weaver	MONR	( )
William M. Iverson	Groundwater Quality - MDNR	(517) 373-8147
Carth Aslakson	Groundwater Quality - MENR	(517) 373-8147
Dan Boone	City of Battle Creek	(616) 966-3494
John Dourjalian	U. S. EPA/TAT	(312)663-9415
Roger Jones	District II WQD-DNR	(517) 322-1688

# <u>VERUNA PUMPING STATION</u> <u>Monday - March 1, 1982</u>

NAME	ORGANIZATION	PHONE
Garth Astakson	Groundwater Quality MDNR	(517) 373-8147
Bill Iverson	Groundwater Quality MDNR	(517) 373-8147
John Dourjalian	U.S. EPA / TAT	(312) 663-9415
Larry Osborne	City of Battle Creek	(616) 966-3421
Roger Jones	District II WOD DNR	(517) 322-1688
Rick Wirsing	Water Supply Division MDPH	(517) 373-1376
Laucine Serne	City of Battle Creek	(616) 966-3407
Don Ltereir	MDPH	(517) 373-1376
Dan Boone	City of Battle Creek	(616) 966-3494

### VERONA PUMPING STATION Friday - March 5, 1982

•		•
NAME	ORGANIZATION	PHONE
Tom DeFouw	U.S. EPA/TAT	(312) 663-9415
Joe Lovato	Groundwater Quality (MDPH)	(517) 373-1376
Garth Aslakson	Groundwater Quality (WQD)	(517) 373-8147
Bill Iverson	Groundwater Quality (DNR)	(517) 373-8147
Rick Wirsing	Water Supply Division (MDPH)	(517) 373-1376
Laurene Serne	City of Battle Creek	(616) 966-3407
Ray Cummings	U.S. Geological Survey	(517) 377-1608
Floyd Twenter	U.S. Geological Survey	(517) 377-1608
Ross Powers	U.S. EPA	(313) 676-6500
Roger Jones	District II, WQD, DNR	(517) 322-1688
Thomas A. Newell	District II Engineer WQD, DNR	(517) 322-1607
Larry A. Osborn	City of Battle Creek	(616) 966-3421
John A. Heppeard	Calhoun County Health Dept.	(616) 966-1241
Russell Schueler	City of Battle Creek	

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**APPENDICES** 

#### Appendices

#### Appendix

- A). Sample Information
- B). Drilling Permission
- C). Well Logs
- D). Spills
- E). Well Installation
- F). Industrial Inspections
- G). Future U.S.G.S. Groundwater Model
- H). Background Information
- I). Emergency Action Plan

Appendix A Sample Information

Appendix A

Sample Information

## 891 WELL SAMPLES

Well No.	Location	CRL No.	Sample No.	Sample Tag No.	Case No.
0	Blank	82WTO8S01	E-1000	12513-12513-22	891
1	Edison Street	82WTO8505	E-1004	12526-12529	891
7	Hampton and Grange	82WTO8S02	E-1001	12523-12525	891
8	Cooper and Willison Avenue	82WT08S03	E-1002	12516-12518	891
9	Culbertson and Dick	82WT) 8S04	E-1003	12519-12521	891

### 902 WELL SAMPLES

Well No.	Location	CRL No.	Sample No.	Sample Tag No.	Case No.
1	North Edison St. near Electric Co.	82WTO8S16	E-1018	12546-12549	902
2	End of Mill St.	82WTO8S09	E-0959	12530-12533	902
3	Mill Street and Emmett Avenue	82WTO8S07	E-0958	12557-12560	902
4	Edison St. Edison St.	82WTO8S18	E-1020 E-0961	12616-12619 12538-12541	902
5	GTWRR Tracks - Emmett Road	82WT08S15	E-1017	12542-12545	902
6	Raymond Road ~ Emmett Road	82WT08S08	E-0957	12552-12556	902
7	Hampton and Grange Avenue	82WTO8S14	E-1016	12550-125601-3	902
8	Copper and - Willison	82WTO8S13	E-1015	12604-12607	902
9	Culbertson Hayes Place	82WTO8S12	E-0806	12608-12611	902
10	Verona Pumping Station/SE	82WTO8S06	E-0807	5-12510-12 12551	902
11	GTW Railroad	82WTO8S20	E-1006	12547-12548 12564-12565	902
12	Kellog Property Edison Street	82WTO8S19	E-1005	12520 - 12561-12563	902
13	GTW Railroad Lagoon	82WTO8510	E-0960	12534-12537	902
14	Kelpack Property Off Jamieson Rd.	82WTO8522	E-1008	12625-12628	902
15	GTW of Jamieson- Road	82WTO8S21	E-1007	12621-12624	902
16	GTW Railyard - near old Roundhouse	82WTO8S17	E-1019	12612-12615	902
17	Raymond Road - Landfill	82WTO8S23	E-1009	12566-12568	902

## 901 SOIL SAMPLES

	CASE NUME	BER 901 - WE	LL NO. 12	
Sample-Location No.	Depth	CRL No.	Sample No.	Sample Tag No.
At Well No 12	0 Ft.	82WT08511	E-1014	12632
At Well No 12	5 Ft.	82WT08S10	E-1520	12633
At Well No 12	15 Ft.	82WT08S09	E-1521	12634
At Well No 12	10 Ft.	82WT08508	E-1522	12635

	WELL NO	. 1]	+	
At Well No 11	10 Ft. 82WTO8	S05 E-1525	12638	
At Well No 11	5 Ft. 82WTO8	S06 E-1524	12637	
At Well No 11	0 Ft. 82WTO8	S07 E-1523	12636	

1	WELL NO. 6	<del> </del>	·	
At Well No 6	15 Ft. 82WT08S01	E-1529	12642	
At Well No 6	10 Ft. 82WTO8S02	E-1528	12641	- 1
At Well No 6	5 Ft. 82WT08S03	E-1527	12646	}
At Well No 6	0 Ft. 82WT08S04	E-1526	12639	
l	<del>                                     </del>		<del></del>	<u> </u>

## MICHIGAN DEPARTMENT OF NATURAL RESOURCES TRANSMITTAL OF EVIDENCE AND LABORATORY ANALYSIS

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☐ DNF	l Pathologist							

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Soil # 18  (5) Regional Office: 5  Sampling Personnel:  The Personnel:	6 For each sam of containers to on each bottle	used and mark v	olume le	
(Name)		Number of Containers	Approximate Total Volume	
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	Water (VOA)		<u> </u>	
(2) Shipping Information	Soil/Sediment	1-802	Faz	
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3/17/82	Other			
Date Shipped:				Con
768857532			-	
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Ground Water	L'Solids			
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Regional Office:  Sampling Personnel:	6 For each sample collected specify nur of containers used and mark volume le on each bottle.						
Tom Defouses (Name): 31:6639415							
(Phone) Sampling Date: 3/10/8 2	Water (Extractable) Water						
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Special Handling Instruction	ctions:		. <u>-</u>		

230 South Deerborn Street Chicago, Minois 60604

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230 South Dearborn Street Chicago, Mingle 50504

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Office of Enforcement Chicago, Mineie 60604 **CHAIN OF CUSTODY RECORD** PROJ NO. PROJECT NAME 401 Battle Crock Ground Whatex n 0000 SAMPLERS: (Signature) 12 Dil REMARKS CON-TAINERS STA. NO. DATE TIME STATION LOCATION 2/... 1470 B 1529 32000 200 (0. 1) # 6 At 12 1. . . 1404 31,0 like. 642 104 WII #6 # 0 /14 1400 3/15 Kon 82111168505 DISTONIE Wil # 11 14 15/14 11/2 wil # 11 14 5 fut \$116166 306 \$ 1524 WITHE 537 3/15 # 11 12 0 /4 dとW762502 だりひき Kan 509 21.5 1000 12 14 15 /4 82 m1 01 509 8 1521 7001 12 w 2/15 1000 .... with all 17 12 WY 10 1 10 15 22 1/11 12635 714 1040 82 W768512 12 1520 TAM 11634 ^ 11 ks 00 m.11 # 17 WILLS II L 1014 THE 19672 Relinquished by: (Signature) Date / Time Received by: (Sienenwe) Relinquished by: (Signature) Date / Time Received by: (Signature) Hulso 1050 wast anuly tec Relinquished by: (Signature) Received by: (Signature) Date / Time . Relinquished by: (Signature) Date / Time Received by: Asignegure) Relinquished by: (Signature) Date / Time Received for Laboratory by: Date / Time Remarks (Signature) Di pition: White — Accompanies Shipment; Pink — Coordinator Field Files; Yellow — 1 ratory File

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82 WTU85 08 A+ Will #12 /0 Ki4	Water Soil/S	ediment		Ship To:
3 Regional Office:	6 For each sam	ple collected sp	ecify numb	
Sampling Personnel:		used and mark v		
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Sampling Personnel:	of containers to on each bottle	used and mark v	olume leve	e) [:	
world Ervel whot	·			į	
(Name) 312 663-7415		Number of Containers		nate	
(Phone)	Water	Commers	TOTAL VOIC		
Sampling Date:	(Extractable)				
3/15/62	Water			1	
(Begin) (End)	(VOA)				
Shipping Information	Soil/Sediment	1-802	8 6≥		
Feeleral Express	Water			;	
Name of Carrier	(Ext/VOA)	· · · · · · · · · · · · · · · · · · ·	<u> </u>		
21.2162	Other				
) / 12/82 Date Shipped:					
Date Shipped.					
- 768857552				j	
Airbill Number:					
8 Sample Description			9 Samp	le Loca	ntion
Surface Water	Mixed Media				-60.0
Ground Water Solids				Z W T	08509
Leachate	Other (specify) _				
	decide Outer (specify)				+ 12 10 tec+
O Special Handling Instruc	ctions:				

	<del></del>				·
	Application of the property of	१९७२ १९ १५४ १५४ १५४ १५४ १५४ १५४ १५४ १५४ १५४ १५४	منابلانا <u>د</u> د حد		Sample Number
[O:(C]:17][	CS IFF IN	भिष्टि । सम्भि	o);}I		<u>E 1520</u>
① Case Number:		ONCENTRATION (Check One)	NC	4 Shi	=
901	1/	•	İ	<del>-</del>	a Tech INC
Sample Site Name/Code:	Low C	Concentration um Concentration	on	Resco	Trange Park Du wel Triangle Park, N
Bathol Creck MI			1		BEYIN Mc CONVAYA
Grown West Suray	3 SAMPLE M			<b>1</b>	BECKEN MC. CONVAYAN
82 WT 085 \$0.	Water			Trans	
H WIN #12 5 /1+	Soil/S	ediment		Ship'	To:
Regional Office:	6 For each sam	nle collected sp	ecify nu	nh	
Sampling Personnel:	of containers	used and mark v			
John DourTAlian	on each bottle	le.			
(Name)		Number of	Арргох	imat <b>e</b>	
· 312 (C 34415		Containers	Total Vo	olume	
(Phone) Sampling Date:	Water (Extractable)		!	•	
7/15/82	Water				
(Begin) (End)	(VOA)				
& Shipping Information	Soil/Sediment	1802	8 0	2	
Fideral Papers	Water (Ext/VOA)				
Name of Carrier				<u>-</u>	
3/17/52	Other				
Date Shipped:	ļ		ļ		
_					
765857552			<u></u>	<del>-</del>	
Airbill Number:					
Sample Description			Sam	ple Lo	cation
Surface Water	Mixed Media				
Ground Water	Solids		8:	2 WT	· 8 S 10
Leachate	Other (specify)_			- •	•
<u> </u>			A+	me1	1#12 5 fees
( Special Handling Instru	ctions:				

(e.g., safety precautions, hazardous nature)

① Case Number:	. —	ONCENTRATION CONTRACTION CONTR	ON (4) Sh	(1) Ship To:  MEOD COLF TICK INC		
Sample Site Name/Code:	Low C	Concentration un Concentration	57	rionga Dr arch Park NC 62709		
Bort Lo: Crack Mi" Ground WUX. + SULUY  F2 W7 08 5 11	③ SAMPLE M (Check C Water _∠ Soil/S	ne)	Attn Tran Ship	Ser Mc County		
Br Well # 12 of cet  (5) Regional Office:  Sampling Personnel:  John Dougt Allow	6 For each same of containers to on each bottle	ised and mark v				
(Name)		Number of Containers	Approximate Total Volume			
(Phone) Sampling Date:	Water (Extractable)					
9/15/82 (Begin) (End)	Water (VOA)					
Shipping Information	Soil/Sediment	1-802	8 02			
Federal Rapress	Water (Ext/VOA)					
Name of Carrier	Other					
Date Shipped:						
768857552						
Airbill Number:						
Sample Description			Sample Lo	ocation		
Surface Water	Mixed Media		82 W	1)2807		
Ground Water	∠ Solids			-		
Leachate	Other (specify)_		A w	: :11 <del>= 1</del> 2		
( ) Special Handling Instru	ctions:			<u> </u>		

TOTERNIT	7.7. 7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.	72 1117	נענע				
① Case Number:	, —	ONCENTRATION CONCENTRATION CON	Mod Turk INC				
Sample Site Name/Code:	Low C	Concentration om Concentration		Triongh Dr Research Triongh Park AUC 2720			
Brith & Crick Mi Ground war Surviy BZ WTU8505 At will # 11 b fred	3 SAMPLE M (Check C	(ne)	7	Attn: Kevn He Quuayay Fransier Ship To:			
Sampling Personnel:  Tow Down Allow  (Name)	6 For each sample collected specify number of containers used and mark volume level on each bottle.  Number of Approximate Containers Total Volume						
(Phone) Sampling Date: 3/15/62	Water (Extractable)						
(Begin) (End)	(VOA)						
Shipping Information	Soil/Sediment	1 8-03	8 02				
Feeleral & +press	Water (Ext/VOA)						
Name of Carrier	Other						
Date Shipped:							
76 8437552 Airbill Number:							
Sample Description			Sample	Location			
Surface Water	Mixed Media						
Ground Water	∠ Solids		8	202807W			
Leachate	_ Other (specify) _		ای دی	11 # 11 15 feet			
Special Handling Instructions, safety precautions, hazard							

Marco Olifoldill	ट्या गाउँ प्राप्त	गुड़ ग्रिअंत	orar.	·	- L 1324	
① Case Number:		ONCENTRATION (Neck One)			p To: Q Tock IN	
Sample Site Name/Code:	Low (	Concentration um Concentration	on .	Friendle Dr Research Triongle Hark MC 272		
Fort & Crick Mi Ground Mostir Surviy 82 W7086 A4 WY11 # 11 Steet	3 SAMPLE M (Check C Water V Soil/S	one)		Attn:	KCUN HC CONNAULY der	
(Name)	6 For each sam	used and mark v	olume le	vel		
(Phone) Sampling Date: 3/15/8 2	Water (Extractable)					
(Begin) (End)	Water (VOA)		·			
. Shipping Information	Soil/Sediment	1.802	80	2		
Name of Carrier	Water (Ext/VOA)					
3/17/62 Date Shipped:	Other					
768887552 Airbill Number:	·					
Sample Description			9 Sam	ple Lo	cation	
Surface Water Ground Water Leachate	Mixed Media Solids Other (specify) .	62 670 \$5 06				
( Special Handling Instructions, safety precautions, hazard		<del></del>		200.1	= 11 E feet	

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E 1500

(1) Case Number:	② SAMPLE CO	Ship To: Nead Tech INC		
Sample Site Name/Code:	Low C	5 Triungle Dr Priongle Paul		
82 wro8 507 H 1411 6'free	3 SAMPLE M (Check O Water V Soil/S	ransfer hip To:		
Sampling Personnel:  John Down 3 Allow	6 For each samp of containers to on each bottle.	used and mark v		
(Name) 312 (63-9415		Number of Containers	Approxima Total Volum	ne ate
(Phone) Sampling Date:	Water (Extractable)			
3/15/62 (Begin) (End)	Water (VOA)			
(7) Shipping Information	Soil/Sediment	1-8 62	802	
Redictal Express Name of Carrier	Water : (Ext/VOA)			
3/17/82	Other			
Date Shipped: 768857552	<u>.</u>			
Airbill Number:			0.0	
	_ Mixed Media _ Solids	Mixed Media		Location  726708507
Leachate	Other (specify)	•	م د د	w11 # 11 0 feet

(0)(chi)	ट्य गार्गाराम	गोद्ध गिम्रोत	0) 47	F 1958		
Case Number:		ONCENTRATION (Neck One)	ON Ship To: Mad Tick INC			
Sample Site Name/Code:	Low (	5 Triongle Dr				
Bothe Crack MI Comedual Survey	3 SAMPLE M		1	arch Triongle Park NC 272		
82W7085A	Water Soil/S	•	Tran Ship			
Sampling Personnel:	6 For each sam of containers on each bottle	used and mark v				
John BuriAlia_ (Name) 312. (63-9415		Number of Containers	Approximate Total Volume			
(Phone) Sampling Date: 9/15/62	Water (Extractable) Water					
(egin) (End)  (7) Shipping Information	(VOA) Soil/Sediment	· 1-80:2	802			
Name of Carrier	Water (Ext/VOA)		·			
3/17/82 Date Shipped:	Other					
2655752 Airbill Number:						
Sample Description		<u>L</u>	Sample Lo	ocation		
Surface Water	Mixed Media Solids	52 W768501				
Leachate	Other (specify) _	الما للم	1 # 6 15 A+			
(e.g., safety precautions, hazard				·		

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Case Number:		ONCENTRATIO	Mea	1 Ship To: Mead Tick Inc			
Sample Site Name/Code:	Low C	reh Trionish Parte					
From D was y Survey  From D was y Survey  From D was y Survey  As well # 6 10 de +	3 SAMPLE M (Check O Water Soil/So	Ser To:					
Regional Office:  Sampling Personnel:	6 For each samp of containers upon each bottle.	sed and mark v					
John Doursallen (Name) 312 (63 -9415		Number of Containers	Approximate Total Volume				
(Phone) Sampling Date:	Water (Extractable)						
3/15/62 Regin) (End)	Water (VOA)						
Shipping Information	Soil/Sediment	1-802	802				
Faleral K+prcss	Water (Ext/VOA)	:					
3/12/82_	Other						
Date Shipped:							
76 6 4 5 75 5 2 Airbill Number:							
Sample Description			Sample Lo	ocation			
Surface Water	_ Mixed Media						
Ground Water	Solids Other (specify) _			vsf02			
(1) Special Handling Instructions, safety precautions, hazard		<del>,</del>	<u> </u>	Well # € 10			

Case Number: SAMPLE CONCENTRATION 4 Ship To: (Check One) Mend Tich INC 901 5 Triumple Dr Low Concentration
Medium Concentration Reserved Trunga Park NC 27705 Sample Site Name/Code: Both Crack Mi Attn: ELVL AC COWANSKY SAMPLE MATRIX (Check One) 3 Crowd : Jumury Transfer Water 12 WTURS 03 Ship To: Soil/Sediment AL WILL 5 tois (5) Regional Office: \_\_\_ 6 For each sample collected specify number of containers used and mark volume level Sampling Personnel: on each bottle. John DuriAhon Approximate Total Volume (Name) Number of 312 602-7415 Containers (Phone) Water Sampling Date: (Extractable) 3/5/82 Water (VOA) (End) (Begin) (7) Shipping Information 1-802 8 02 Soil/Sediment Water Federal Ktpass (Ext/VOA) Name of Carrier Other 3/17/82 Date Shipped: 768657552 Airbill Number: 8 Sample Description Sample Location Surface Water Mixed Media

(ii) Special Handling Instructions: (e.g., safety precautions, hazardous nature)

\_ Ground Water

\_ Leachate

Solids

Other (specify)

5 feet .

82 wTC8503

A4 NI # 6

(S) ORGINI	es instan	मंद्रि शिक्षेत्र	9337		Sample Number E 1526		
Case Number:		ONCENTRATION (Check One)	ON Ship To: Meach Tech Tuc				
Sample Site Name/Code:	Low C	Concentration um Concentratio	on Research & Roy L. UC 2>>01				
Bornle Crak Mi  Ground Warin Scrucy  EZ WTOFSON  Aunil # 6 0 feet	③ SAMPLE M (Check C	one)		Attn: KOUN McCOUNAUGKY Transfer Ship To:			
Sampling Personnel:  To ha Doursalian  (Name)	6 For each sam of containers on each bottle	used and mark v	olume le	vel			
313 (C 3 -94/5 (Phone) Sampling Date:	Water (Extractable)	Containers	Total Vo	olume ·			
3/ (5/82 ( 'egin) (End)	Water (VOA)						
Shipping Information	Soil/Sediment	1-802	8	6Z ·			
Federal Express Name of Carrier	Water (Ext/VOA)						
3/17/82. Date Shipped:	Other						
<u> </u>							
8 Sample Description			(9) Sam	ple Lo	cation		
Surface Water	Mixed Media  Solids			<b>~</b> ~ .			

(ii) Special Handling Instructions: (e.g., salety precautions, hazardous nature)

Other (specify)

230 South Deerborn Street Chicago, Minels 60604

CHAIN OF CUSTODY RECORD

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891			7 (1	<u>.E</u>	Cree	K W	<u> </u>	Shray	NO.	}			<b>7</b> 8	/ L						2
SAMPLER	S: (Sign	eture)	Un.	nM	IL N	11/		<u>.</u>	OF CON-		/ / !			<b>y</b> /	//		·	REMARKS	; ;	9900000
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Relinquish	ed bŷ:	Signature	<del>,</del> —		Date / 4/80	/Time /900	1 <i>li</i> 1	by signisture		Reli	nquis	hed b	y: (Sig		e)	Detail	/Time	Received by	: (Signature)	
Relinquish	ed by:	Signature)	,	•		/Time	Received	by: (Signature,		Reti	nquisi	hed by	y: (Sig	netyr	o)	Dete	/Time	Received by	: (Signeture)	
Retinquish						/Time	(Signature	•				o /Ti	me	A	omarks		<u>l</u>	<u> </u>		
	THE GIP	Mion: Whit	te — /	<b>NOCOM</b>	panies Ship	xnent; Pini	ı — Coordin	ntor Field Files;	Yellow — I ^	wraton J	/ File		<del>-</del>	L						الخصر وسندجي
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(i) Case Number:		ONCENTRATION (Neck One)	ON	(4) Ship To: ACCUTER CURP		
Sample Site Name/Code:  RATTLE Creck Mi  Graws-Wake Smoy  BJWTOB SO3	Medin  SAMPLE M  (Check C	Dne)	on	Energy Muo Environment 405 CHOR AUC MOUNTAIN VIEW, CAI. F9404 Attn: Linda Bullanunas. Transfer Ship To:		
(Name)	© For each sam of containers on each bottle	used and mark v		ri cimate		
(Phone) Sampling Date:	Water (Extractable)	2 1/2941	19A1 40N			
	Water (VOA)	١				
Shipping Information	Soil/Sediment	,	1			
FEDERAL Expires.	Water (Ext/VOA)	Broke in Swage.				
Name of Carrier 2/2 6.2</th <th>Other</th> <th></th> <th></th> <th></th> <th></th>	Other					
Date Shipped:	·					
76885536						
Airbill Number:						
Sample Description			<b>9</b> Ѕал	ple Loc	cation	
Surface Water	_ Mixed Media		,	_	tce 503	
Ground Water	_ Solids		wel	1 # 8	3	
Leachate	Other (specify)		Cooper à Willison Rue			
Special Handling Instru						

)	ORGANI ORGANI	CPS INSTANT TO THE TO SELECT OF SELECT OF SELECT OF THE PROPERTY OF THE PROPER	MG BHY	933		Sample Number E B1003
<i>\</i>	O Case Number: 891  Sample Site Name/Code: BATTLE Crock Mi Grams Water Shuby 92 wrob Soy	Low C  Low C  Media  SAMPLE M  (Check C			eni 405 Mou	culer (cap erly t Environment Clyde Aue. Inlamview 1041.09404 Linda Bohannas.
	(S) Regional Office: S Sampling Personnel:  Thomas Office: S (Name) 3/2 (2/-3-94/5 (Phone)  Sampling Date: 2/34 (Begin) (End)	6 For each sam of containers on each bottle  Water (Extractable)  Water (VOA)	used and mark v			
	Shipping Information  FENERAL Expires.  Name of Carrier	Soil/Sediment Water (Ext/VOA)	Brike in Shamor		•	
	7/25/87 Date Shipped: 7/69 55 36 Airbill Number:	Other			-	
	Sample Description     Surface Water	Mixed Media		9 Sam	-	rce soll

9 Special Handling Instructions: (e.g., safety precautions, hazardous nature)

Other (specify)

Leachate

CULBERTSON & Dizk Street

75 South Dearborn Street Chicago, Minole \$0604

5-3517

**CHAIN OF CUSTODY RECORD** PROJECT NAME PROJ. NO. BATHE CAFFK, MI. GrowNo WAKE NO. SAMPLERS: (Signature) 4 homas REMARKS CON-TAINERS DATE TIME **STATION LOCATION** STA, NO. E1000-82 WTUE 504 2/25/2 VUA-1/25/3/2517 7415 12574, 17525 NOA 19575 Relinquished by: (Simply) Date / Time Received by: (Signature) -Relinquished by: (Signature) Received by: (Signature) Relinquished by: (Signeture) Received by: (Signature) Relinquished by: (Signewre) Data / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received for Laboratory by: Date / Time Remarks (Signature) Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Laboratory File

ORGINI	के जिल्ला है	भुडि छिम्रेर	Me	E 01004	
Sample Site Name/Code:  Battle Creek Mi Grains Waker Shop  92 usto 8 505	J Low C Mediu  SAMPLE M (Check C			3 Ship To:  Accurack Corp.  Energy + Enurronmen  HUS CLYOE AVE  Mountain View, Chit of  Attn: Linda Bohannas  Transfer  Ship To:	
Sampling Personnel:  Thomas H. Defeuce:  (Name)  312 663-9415	6 For each sam	ple collected sp	olume lev		
(Phone)  Sampling Date:  (Begin) (End)	Water (Extractable) Water (VOA)	D Baal	19A1.		
Shipping Information  FEOCRAL FARMS  Name of Carrier	Soil/Sediment Water (Ext/VOA)		4cml		
2/35/82 781. 24505536 Date Shipped: 7686 5536	Other				
Airbill Number:					
(a) Sample Description  — Surface Water — Mixed Media  — Ground Water — Solids  — Leachate — Other (specify) — EDISON Are by frue: Co					
(e.g., safety precautions, hazard					

_	ORGINI	181181186 181181186	MC BAK	Me		E 01001
	① Casc Number:	(0	ONCENTRATION Check One)	(1) Ship To: ACCUREX CURP. ENERGY AND ENUTUMENT		
-	Sample Site Name/Code:		Concentration um Concentration	on	405	NHAN VIEW CALL.
	Grains WAKE STORY	③ SAMPLE M				Linda Bohannas.
	82WTOB 502.	Water Soil/S			Trans Ship	· <del>-</del>
	5 Regional Office: Sampling Personnel:	6 For each sam of containers on each bottle	used and mark v			
	THOMAS DEFOUND (Name) 312-663-9415		Number of Containers	Approxi	imate lume	
$\mathcal{T}$	(Phone) Sampling Date:	Water (Extractable)	2 1/2 gA	1941		
	2/23/82 (Begin) (End)	Water (VOA)	1	40~2		
	<ul> <li>Shipping Information</li> </ul>	Soil/Sediment				
	FEOFRAL Express.  Name of Carrier	Water (Ext/VOA)	Via Brike The Storage.		:	
	2/25/82	Other				
	Date Shipped:			 		
٦	768855636.		} }		·	
Į	Airbill Number:  8 Sample Description			@ S	-1-7	
		Mixed Media		(9) Sam		28 SQ 2.
•		_ Solids		WE		<del>-</del>
	Leachate	Other (specify)		Ho	nd lon	eA squarend con i
	Special Handling Instructions, hazard		<u> </u>	<u>.                                    </u>		

	ORGINI		4 <u>6</u> 13145	DINI.		E Ø1000	
~	Sample Site Name/Code:  BATTLE Creek Mi  Grawn-Water Stripy ED WTOB SOL	Low	ne)		1) Ship To: 1) CC UPEX CLEP ENCIGHT ENVIRONMENT 405 CLYDEAUE MOUNTAIN VIEW CALF. 94 Attn: Linda Bihannak Transfer		
-	(5) Regional Office: _5Sampling Personnel:	Soil/S  6 For each sam	ediment  ple collected sp  used and mark v				
	(Name) (Name) (Phone)	Water	Number of Containers	,	mate ume		
	Sampling Date:  2/22/82 (Begin) (End)  ) Shipping Information	(Extractable) Water (VOA) Soil/Sediment	0.771	19A1 40M	)		
,	FEDERAL Express Name of Carrier	Water (Ext/VOA) Other	1	HO-VIA			
`	2/25/82 Date Shipped: 76 88 5.56 36						
	Airbill Number:						
	Sample Description      Surface Water      Ground Water      Leachate	Sample Location  SIWTOBSOIL  BLANK  Distilled Hz D  From pumping States LAB.					
	Special Handling Instructions, hazard		<u> </u>	-		Programme And,	

5-3519

	N SIKKNIU ES	Man Andrews	Engra 1							
Case Number.										
902	(2) Sample Type: (Check One	3 Ship To: Accurer Conp								
	Run Off	2	Energy AND Environment							
	well how C	ONC	405 CLYDE Ax							
Sample Site Name/Code:  BAHIC Cock, Mi	Receiving Water FNJ	Mountain wew, Californyz								
	Leachate		Mountain well art 94042							
BOWTOB SOS	Effuent		Attn:							
Well #2	Other (specify)	·	LINDA BUHANNAS.							
			PERCENT TO A SEASON OF THE PERCENT O							
(4) Regional Office:	(5) Mark Volume Level on Sa	mple Bottle								
Sampling Personnel:	•	Date								
Mome)	·	Sampled								
312 663-9415	Extractable 1691	3/8 81								
(Phone)										
Sampling Date:	Extractable 1/29A1	3/8 87	AD RELEASED FOR							
3/8	Extractable									
(Begin) (End)	<del></del>	<u> </u>								
(6) Shipping Information	Extractable									
j	VOA Unpreserved	2/4/								
Federal Express Name of Shipper:	, jory	3/8/22								
1.1	VOA Unpreserved (Duplicate) 40ml	3/8/82								
3/9/82		3/0/0								
Date Shipped:										
A # 5 5 5 5 5 4 4										
9 1886 57541 Airbill Number:										
Description of Sample Locati										
well #2										
well # I										
	$I \sim 11 \sim 1$									
END of Mill Street										
<del></del>		<u></u>								
Special Handling Instruction (e.g., salety precautions, hazardou										

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1) Case Number:	2 Sample Type: (Check One)	3						
702	Run Off		Accuser Corp Enc.gr and Empenment					
Sample Site Name/Code: BAHLE Creek, M: Ground Wale/Shoy BUTOB \$10 Well #13		ample A	Moua Minuieu, Calif 94042					
Regional Office: Sampling Personnel:	(5) Mark Volume Level on Samp	e Bottle						
Tom DeFour	S	unpled						
312 663-9415 (Phone) Sampling Date:		3/8 /8						
3/8 (Begin) (End)	Extractable							
Shipping Information	Extractable							
Federal Express Name of Shipper:	VOA Unpreserved 40Al	3/8 3/8						
3/9/8 > Date Shipped:	(Duplicate)	76						
4 88857541 Airbill Number								
7 Description of Sample Location:								
By Rail ROAD RAJAON  3 Special Handling Instructions:								
(e.g., salety precautions, hazardous nature)								

1) Case Number: 902	2 Sample Type: (Check One)  Run Off  Well Low Conc	3 Ship To:  Accuraçãon p  ENCIGY AND ENVIRONME
Sample Site Name/Code: BAHLE Creek ! M' BAWFOB SIGN 6100ND WARE SUNKY Well #4	— Receiving Water  — Leachate Favo SAr  — Etiluent  — Other (specify)	Mos Clype Ave  Mos Clype Ave  Mos Clype Ave  9404  Attr:  hivor Bohmas.
Regional Office: compling Personnel: Term Oxform	Mark Volume Level on Sample     Da     Sample	
(Name) 3/2 663-94/5 (Phone) ampling Date:		/B /B
(Begin) (End)  Shipping Information	Extractable  Extractable	
FEOCIAL Express Name of Shipper.	VOA Unpreserved 40 3	<u>/8</u>
3/9/82 Date Shipped:	(Duplicate) 40 3/	
8 8 8 5 7 5 4 Airbill Number:		
Description of Sample Loca  We /	tion: 82WT08 SIII 1 # 4 0130N SF	

230 South Dearborn Street

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	PROJ NO. PROJECT NAME 102 DATILE CIRCLIMI GIGUNG AH					Growne v. Ah.	NO.					7					2260																		
SAMPLERS: Isignoture)					OF CON-				REMARKS 0			REMARKS 0																							
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/ 3	3/9	17:50	<u> </u>			ا مر	# B	4	<b>├</b>									1 1015																	
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· <u> </u>	1/9	17.10				<u> </u>	#5	4	+-	-		<del>-  </del>	-	$\dashv$				1 1017																	
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Relinquished by: (Signature) Date / Time Received by: (Signature)				))	Reli	inquish	ed by	: (Sign	oture	j	C	Date / Tim	Ne	Received by: (Signature)																					
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	Dist-'hy	tion: Whit	10 — A	ccomp	penies Shipr	nent; Pink	Coordinator Fleid Files;	Yellow Lr	retor	y FHe	ــــــــــــــــــــــــــــــــــــــ	<del>,</del>	1																						
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1017-11		44010	
(1) Case Number:	2 Sample Type: (Check One	·}	3 Ship To:
( 902	Run Off		Accuracy Corp
	_∠ Wel		Energy AMPENVIRON HOS CLYDE AVE
Sample Site Name/Code:	Receiving Water		405 CLYDE AVE
BATTLE Creek M.	Leachate	•	Mountain view, CA'
28 WT08 S 12	Effluent		Attn: - 94043
well #9.	Other (specify)	· · · · · · · · · · · · · · · · · · ·	LINDA BOLANNA
1 Regional Office: 5	(5) Mark Volume Level on Sa	mple Bottle	
Sampling Personnel:		Date	
Ushn Dourjalian		Sampled	
312 663-94/5	Extractable 1/29Al	319	
(Phone)		3 h	
Sampling Date: 3/9	Extractable 1/2 SAI	34	
(Begin) (End)	Extractable .		
) Shipping Information	Extractable		
EEGADAL E	VOA Unpreserved		
FEOCRAL Express Name of Shipper:	VOA Unpreserved	<u> </u>	
	(Duplicate)		
3 lio/85 Date Shipped:			
trae supped.		<del> </del>	
<u>768857541</u>		<u> </u>	<b>三人员的</b>
Airbill Number:			
(7) Description of Sample Locati	ion: MA TARKY		
	890108312		
7107	~ Well #9		
Culbert	son + HAVES P	lnæ	•
CO.4611	the state of		
(9) Special Handling Instruction		<del></del>	
(e.g., safety precautions, hazardou			

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① Case Number:	1 —	ONCENTRATION (Check One)	ON (4) Ship To:  Accurex, Coep.  Encist and Environ			
Sample Site Name/Code:	Low C	Concentration m Concentration	HUS CLYDE AVE			
BATILE CREEK, Mil Groups Water Survey BAWTOBSI3 Liel #8	③ SAMPLE M (Check C ————————————————————————————————————		T	Mountain view, Calif- Attr: Linda Bohannas Transfer Ship To:		
5 Regional Office:Sampling Personnel:	6 For each sam of containers on each bottle	used and mark v	ecify nui colume le	PAGE		
John Dougalian (Name) 312 663-9415	•	Number of Containers	Approxima Total Volum	ate ne		
(Phone) Sampling Date:	Water (Extractable)	a - 1/291	lgal			
(End)	Water (VOA)	2 -40mL	Bomb	2		
Shipping Information	Soil/Sediment					
FEDERAL EXPOSE	Water (Ext/VOA)			2 MA		
Name of Carrier 3/10/82	Other					
Date Shipped:						
7 6 885 9 5 41 Airbill Number:		•				
Sample Description	Sample Location					
Surface Water	EA WTOE S13					
Ground Water	Well #8					
Leachate	cooper & Willison Au					

Special Handling Instructions: (e.g., safety precautions, hazardous nature)

0000079

Sample Number

u	OKENIU OKENIU	देर्ड 'मिरेशें	ाँ । रामरे	937	E 01017			
	(1) Case Number:		ONCENTRATION (Check One)		1 Ship To: Pecurex Conp			
~	Sample Site Name/Code:		Concentration um Concentratio	EV	FOURTY AND ENVIRONMENT			
•	BATTLE Creck, Mi COUND WATER STUDY BAWTOB SIS	③ SAMPLE M (Check C	ne)	Atta	Attn: Liwon Bchnnuns Transfer			
-	We.11 #50		ediment	Ship	Ship To:			
	Regional Office:  Sampling Personnel:	6 For each same of containers to on each bottle	used and mark v					
ا ر	.lchu Oburjalian (Name) 312 663 9415	•	Number of Containers	Approximate Total Volume				
	(Phone) Sampling Date:	Water (Extractable)	3/2 gal	ISAL				
	3 /9 (Begin) (End)	Water (VOA)	40 M	40 mf				
•	(/) Shipping Information	Soil/Sediment						
<i>'</i>	Feberal Express Name of Carrier	Water (Ext/VOA)	Hond	40 ml				
	3/10/62	Other						
.	Date Shipped:			,				
	7 6 8 8 5 7 5 4 / Airbill Number:	<u> </u>						
Ì	Sample Description	Sample Lo	_					
	Surface Water	_ Mixed Media		Eau	v708515			
	Ground Water	Solids		1	vell #5			
ſ	Leachate	_ Other (specify) _		Emmel	+ ROAD - GTWRR TIME			

) Special Handling Instructions: (e.g., safety precautions, hazardous nature)

ENVIRONMENTAL PROTECTION AGENCY CEAL NO. 1563 Office of Enforcement Chicago, Minois 60604 CHAIN OF CUSTODY RECORD PROJECT NAME PROJ NO. DHILE CREEK, Ali Grunowaka Shipy 00000 SAMPLERS: (Signature) OF REMARKS CON-TAINERS STA. NO. DATE TIME STATION LOCATION well # 10 EDWILL SUL CUBUT 1.100 1300 7895 3-17510 -17512 r 17551 Bow1ve 507 For 958 1/1/02 11:3 Well #3. games sub Fu950 ....5 1500 Relinquished by: (Signature) Date / Time Date / Time Received by: (Sienawe) Received by: (Signeture) Relinquished by: (Signature) Relinquished by: (Sienerure) Date / Time Received by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signeture) Relinquished by: (Signature) Date / Time Received for Laboratory by: Date / Time Remarks (Signature) Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Leboratory File 5-3505

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## गरा ० इस है। जी सम्राहे गाँध हिंगी प्रस्ति ।

Sanple Number

60807

Sample Site Name / Code:  Bettle Creck Common  Grand Water Shor  920108 SOG  Well # 10	2 Sample Type: (Check One)  — Run Off  — Well  — Low Conc.  — Receiving Water  — Leachate  — Effluent  — Other (specify)	3 Ship To: ACCUTCK CORP EWESY AND ENVIOLMENT 405 CLYDE AVE MOUNTAINVIEW, CALIF 94042 Attn: LINDA BUTANNAS
(4) Regional Office: Sampling Personnel:  Tom De Fou (Name) (Name)  312 663-94/5 (Phone)  Sampling Date: (3/7 (Begin) (End)	Sompled  Extractable  Stractable  Extractable  Stractable  Stractable  Stractable  Stractable  Stractable  Stractable  Stractable  Stractable  Stractable	
Shipping Information	Extractable  VOA Unpreserved	
FEDERAL Express. Name of Shipper:  3/9/82  Date Shipped:  768837541  Airbill Number:	VOA Unpreserved (Duplicate)  3/8	

7 Description of Sample Location: Ground WAter SAmple.

BOWTOB SO 6

Verona Pumping Shahon 15 SE Corner.

Special Handling Instructions: (e.g., safety precautions, hazardous nature)

3	OKCHINICS ABINANCE BANGOSTICA CONTRACTOR OF THE PROPERTY OF TH
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Sample Number ECGJY

- Run Off - Well LOW CON	c, .	HOS C Mounty Attn:	ex CORP I AND ENVIRONMENT LYDE AVE INVIEW, CALIF. 94042 Bohannas
(3) Mark Volume Level on Sa	mple Bottle		
	Date Sampled		
Extractable //2 94	3/3		
Extractable 1/294	3/8		
Extractable			
Extractable			
VOA Unpreserved 40+f	2/8		
VOA Unpreserved (Duplicate) 40 pl	3/8		
	- Run Off - Well	Well FOW CONC,  — Receiving Water PNU. SAMPLE  — Leachate  — Effluent  — Other (specify)   Sompled  Extractable 1/294 3/8  Extractable 1/294 3/8  Extractable 1/294 3/8  VOA Unpreserved 404 3/8  VOA Unpreserved 404 3/8	- Run Oll - Well how Conc, - Receiving Water Pann. Sample - Leachate - Effluent - Other (specify)  S Mark Volume Level on Sample Bottle  Extractable 1/294 3/8  Extractable  Extractable  VOA Unpreserved

1) Description of Sample Location: Grown WAter Sample

82 WTO 8507

well#3

MILL STreet AND Emmet

Special Handling Instructions: (e.g., salety precautions, hazardous nature)

_		PARTITION OF THE PARTIES OF THE PART	30000		Sample Number	H					
	(1) Case Number:	② Sample Type: (Check One		(3) Ship To:		!!   					
	902.	Run Of	•	Accure	y Conf						
Ų		Well Low Co.		4700cg	y + Environment LYDE Ave	']					
	Sample Site Name/Code:  Battle Creek, M:	— Receiving Water FN	uikow.	Maunta	nuew, Calif						
	Ground Water Stray	Effluent		Attn:	<i>' 94042</i>	•					
~	Bawt 08 508 well#6	Other (specify)	·	hinoa	Bohannas.						
	(1) Regional Office:	Mark Valume Level on San	mple Bottle								
-	Sampling Personnel:  Tom Octour  (Name)		Date Sampled			7					
	(Name) 312 1063 -9415 (Phone)	Extractable 1/294	3/8								
$\left  \right $	Sampling Date:	Extractable 1/2 GA	3/8			المتالية					
	3/8 (Begin) (End)	Extractable									
	Shipping Information	Extractable				,					
	FEDERAL Express Name of Shipper:	VOA Unpreserved				7.					
	1 /	VOA Unpreserved (Duplicate)				161 611					
-	3/9/82 Date Shipped:			20.00		11.11					
		_				\$ *** X *					
	768857541 Airbill Number:	_				メルス					
۱ ر آ	(7) Description of Sample Locati				HELD CANALIST	<u> </u>					
	Description of Sample Location: Grunne Water Sample '82 WTD8 SO8 Well #6 Raymond Rd 2 Emmet										
	, 85 MLD8 208										
	· U	vell#6. Raym	ond Rd	i Emme	.+'						
	Special Handling Instruction (e.g., safety precautions, hazardou										
1											

0000084

230 South Deerbern Street Chicago, Mineis 60604

**5-3508** 

**CHAIN OF CUSTODY RECORD** PROJ. NO. PROJECT NAME 102 Balt Clark Mi Grand White APLERS: (Signature) SAMPLERS: (Signature) REMARKS CON-TAINERS DATE TIME STATION LOCATION STA. NO. 82W] U8517 1 1019 (nell # 16 16 OC 2/3 TAG 40 1261: 15 3/15 15 30 1 % RI WTORSIR E 1010 Well # 4 TAG NG 12616-19 Will # 1 16 3/9 82 WT 08 S 16 E 1018 1645 TA: -# 175416 - 49 C 4 3/9 1725 W/1#7 82 W708514 F 1016 7 AC 114 12 550 1 12601-03 Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature) Jeny Come PL Dal 3/1/86 1800 Refinquished by: (Signature) Received by: (Signature) Relinquished by: (Signeture) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received for Laboratory by: Date / Time Remarks (Signature) Distr fion: White -- Accompanies Shipment; Pink -- Coordinator Field Files; Yellow -- Laboratory File

ORGINI	GS 141313	मुख्या । इस्ते विकास	186	E £1020			
Case Number:	(C	ONCENTRATION CONCENTRATION	A	Ship To: CCUPEX COPP Dergy And ENVIRONMENT			
Sample Site Name/Code:	Medi	m Concentration		os Clyde Ave ountam View CA 94042			
Battle Crack Mi Ground Worker Survey 82 W TON S 18 Well #4	3 SAMPLE M (Check C — Water — Soil/S		Attn: LINDA BOLONNAS Transfer Ship To:				
Sampling Personnel:	6 For each sam of containers on each bottle	used and mark v					
John 1) our JAlian (Name) (812) 663-9415	••	Number of Containers	Approxima Total Volum	ate ne			
(Phone) Sampling Date:	Water (Extractable)	2-Ye gal	1 gal .				
3/10 (Begin) (End)	Water (VOA)	1- 40 Ml	40ml·				
(7) Shipping Information	Soil/Sediment						
Feder J Express Name of Carrier	Water (Ext/VOA)	1-40 ml	40 ml				
3/10/82	Other						
Date Shipped:							
768857541/ Airbill Number:			·				
Sample Description		_ · · · · · · · · · · · · · · · · · · ·	Sample	Location			
Surface Water		8.	2 WT085 18				
Ground Water Leachate :	Solids, Other (specify) _		Folison Street				
Special Handling Instructions, hazard							

ORGANICS DIVING BLAKONAR									
① Case Number:	. —	ONCENTRATION (Control of the Control	Accurex Corp Energy And Environment						
Sample Site Name/Code:	Low C	Concentration um Concentratio							
Battle Creek Mi Ground Water Survey 82 WT 08 S 17 Well # 16	3 SAMPLE M. (Check Co.) Water Soil/S		Attn	Attn: LINDA BOLONNAS Transfer Ship To:					
Sampling Personnel:	6 For each sam of containers on each bottle								
John Doursalien (Name) (312) 663-9415	•	Number of Containers							
(Phone) Sampling Date:	Water (Extractable)	2-1/2 gal	1941						
3/10 (Begin) (End)	Water (VOA)	1-40 ml	1-40M						
Shipping Information	Soil/Sediment								
Federal Express Name of Carner	Water (Ext/VOA)	1-40 Ml	40 ml						
3/10/82 Date Shipped:	Other								
768857541 Airbill Number:									
Sample Description			Sample Lo	cation					
Surface Water	82 WT 08	8 5 17							
Ground Water	_ Solids 、	Croud Tr	unk Rouly Ard						
Leachate	_ Other (specify) _	Croud Trunk Rouly Ard behind Round house							
Special Handling Instructions, hazard		•							

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•	ORGANI	CS TAISANA Maria Sarana Maria S	1333 300 13 23 300 13 13 13 13 13 13 13 13 13 13 13 13 13 1	934	Sumple Number  E D1018		
	D Case Number:  903  Sample Site Name/Code:  Rattle Creek, Mi  Creek, Mi  Creek, Mi  Creek, Mi  Wake Survey  Rauntob Sile  Well #1	3 SAMPLE M	<b></b>	Attn	A Ship To:  Accurate Corp.  Energy and Environment  YOUS CLY DE AND  Mountainuiten, Calt And  Attn: Linday Bohannes  Transfer  Ship To:		
	Sampling Personnel:  John Dour Jahan  (Name)  (Phone)  Sampling Date:  3/9  (Begin) (End)	© For each same of containers to on each bottle.  Water (Extractable)  Water (VOA)	used and mark v	olume le			
	Shipping Information	Soil/Sediment	1-101-2	7014			
	FENCIAL EXPIRES  Name of Carrier	Water (Ext/VOA)	1-40ml	40 m			
	3/10/62 Date Shipped:	Other					
	7688575-4/1 Airbill Number:						
	Sample Description     Surface Water	Mixed Media		Sample Location     およいている ション     はない できる ション     はない できる リン     はない できない できる ローはない できない できない できない できない できない できない できない でき			
	Surface Water	Well #A					

Special Handling Instructions: (e.g., safety precautions, hazardous nature)

Leachate

Other (specify)

North Edisonst

	ORGINI	GS IN UNITED IN	मुद्ध भित्रप्र	100		E 01016		
į	① Case Number:	, <del>-</del>	ONCENTRATIO	ON	4 Ship To:			
ľ	902	(C	heck One)	į	Ac	CUYEX CORP		
	Sample Site Name/Code:		Concentration un Concentration	o <b>n</b> .	પુરુ	CONTAIN VIEW, CALIE.		
İ	BATTLE Creek, Mi	3 SAMPLEM	IATRIX	); ·	Attn:	FINO H. BCHHNING		
	Ground Water Survey	(Check C	<del>-</del>	50	Trans	THE PART OF THE PA		
	<u>Pawtor siy</u>	Water		•	Ship 7			
	Well #7	SOM S	ediment					
	5 Regional Office: _5	6 For each sam	ple collected sp	ecify nu		<del></del>		
	Sampling Personnel:		used and mark v					
1	milazzonade		•	_				
	(Name) w	Historia de la la compania de la compania de la compania de la compania de la compania de la compania de la co La compania de la co	Number of	Approx	imate	<b>一种的大型</b>		
	312 663-945	-	Containers	Total Vo	olume			
4	(Phone) Sampling Date:	Water (Extractable)	a 1/2 9Al	1781				
	3/9	Water	V. 2761					
]	(Begin) (End)	(VOĀ)	, tome	40m	:			
ī I	3) Shipping Information	Soil/Sediment						
	FENCIAL EXPRESS	Water (Ext/VOA)	١-4٥سل	40 al				
	Name of Carrier	Other						
	3/10/82		·		_ <del></del>			
	Date Shipped:							
ا .	088857541							
1	Airbill Number:							
ļ								
1	Sample Description			(9) Sam	ple Loc	eation		
-	Surface Water	_ Mixed Media		·	Bau	TCE 514 11#7		
	Ground Water	_ Solids	ı					
	Leachate	_ Other (specify) _		Ita	Ampton and 6 mge A			
ł	(e.g., safety precautions, hazard			<u> </u>	<del>-</del> i			
	teran emera bracenous, interior							
		•				0000089		

## ENVIRONMENT . PROTECTION AGENCY Office of Enforcement

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7687 : 7516

REFFON 5
230 South Jarborn Street
Chicago, Illinois 60604

CHAIN OF CUSTODY RECORD

		PROJECT NAME						1			/ /	′ / .			<u></u>	
90		101	1.0	<u>)                                    </u>	Cicc	1. 1.14	ch Grand uma	NO.				//		• •	• •	
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STA. NO.	DATE	TIME	00 00 00	GRAS		STATIC	ON LOCATION	TAINERS	13		7 1 1	u*//		•	REMARKS 0	
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062	3/15	1400		./	U) e	# #	<u> </u>	4	igsqcut	_			1		520 E 1005	
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Relinquist	Relinquished by: (Signatu		,		Dete	/Time	Received for Laborator (Signature)	y by:		ate /T	ime	Remer	ks .			
	Dietrib	dion: Whi	to — /	Accom	penies Bhis	ment; Pin	k — Coordinator Field Files;	Yellow Lab	oratory FI	)o		1	-			

	ORGINI	GZ WZZZ	१ <u>८ । धुमुर</u>	933		E Q1005			
	① Case Number:		ONCENTRATION (Check One)	ON	Ship To	_			
(	Sample Site Name/Code:		Concentration um Concentration	on	ACCUTER COMP ENCYGY ALD ENVIRONME 405 CHALE AUR HOUNDANN VILW CA 940				
	Borrlo Creek Hi Grown Where Curvey 82 WTO 8 5 19	3 SAMPLE M	One)		Attn: 21 wo a Bokanne Transfer Ship To:				
	S Regional Office:	6 For each sam	ple collected sp	ecify num					
	Sampling Personnel:  John Dour JAlian	or containers on each bottle	used and mark v	oimue ie <b>v</b>					
	(Name) (312) 663 - 7415 (Phone)	****	Number of Containers	Approxim Total Volu	nate une				
7	Sampling Date:  3/15-/8-2	Water (Extractable) Water	2-1/29-1	1 301					
	(Begin) (End)  7) Shipping Information	(VOA) Soil/Sediment	1-40ml	40M1					
	Forderal Express	Water (Ext/VOA)	1- 4ml	Homl					
	Name of Carrier 3/17/82	Other							
	Date Shipped:								
1	768857596 Airbill Number:								
Ī	Sample Description			Sample Location					
	Surface Water	_ Mixed Media		82~	3708	5.19			
	Ground Water		م ہا	<del>.</del> : \\ o a a					
	Leachate	tellogg Property by Edison Street							
	© Special Handling Instructions, hazard			<u> </u>					
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	① Case Number:	, —	ONCENTRATIO	ON (4)	Ship To:	·			
	902 "	(C	heck One)	<b>,</b> ,	Accure	the Corp			
	•	Low C	Concentration		Provad	Ung Burisonne			
- [	Sample Site Name/Code:	Medi	ım Concentratio	on	Monstein View CA Attn: Linda Bohowa				
1	Battle Creek Hi								
1		3 SAMPLEM			~ ( /	CX C DO POWA			
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j	Sampling Personnel:	of containers	used and mark v						
1		on each bottle							
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•	(312) 663-9415:		Number of Containers	Approximately Total Volument	me				
T	(Phone)	Water			18				
1	Sampling Date:	(Extractable)	2 1/2 gal	1341					
1	3/16/82	Water		_	84.7				
Į	(Begin) (End)	(VOA)	1-40~1	46m1					
1	) Shipping Information	Soil/Sediment							
}									
1	Federal Express	Water (Ext/VOA)	1-40ml	400)	- 12.5% - 73.53				
۱	-Name of Carrier		<u> </u>						
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 Special Handling Instructions: (e.g., safety precautions, hazardous nature)

230 South Dearborn Street

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	`_	(8)					)						L	- '}-			~ -	E11

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Sample Site Name/Code:	Low Concentration Medium Concentration	Evergy AN 405 CM & University

Other (specify)

5 - T - T - T - T - T - T - T - T - T -							
Low C  Low C  Mediu  SAMPLE M  (Check C)  Water	ne)		Transfer Ship To:  Accurate Corp  Energy And Environment  405 Chall Auc  Universe Now Ch  Attn: Linda Bahanas  Transfer  Ship To:				
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_ Solids		6	++	JON KEON AVC			

Sample Number

(10) Special Handling Instructions: (e.g., safety precautions, hazardous nature)

Grown Glater Such

John Doursalian (Name)

(Phone)

(7) Shipping Information

Frederal Express

Name of Carrier

Date Shipped: \_

68857596 Airbill Number:

8 Sample Description

Leachate

Surface Water

**Ground Water** 

3/17/82

663 9415

(End)

162 80TW 18

Well # 15

(5) Regional Office: \_

Sampling Personnel:

312

Begin)

Sampling Date:

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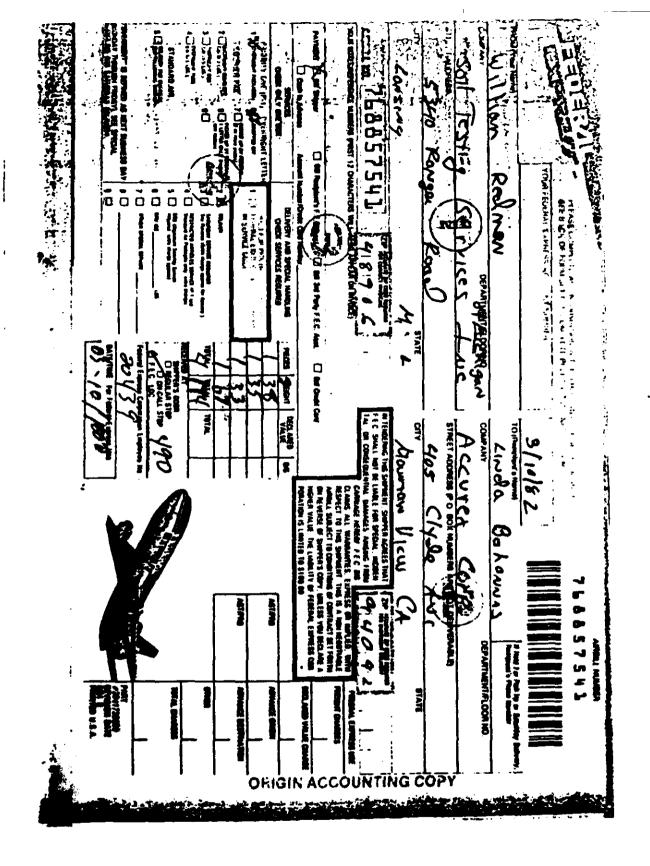
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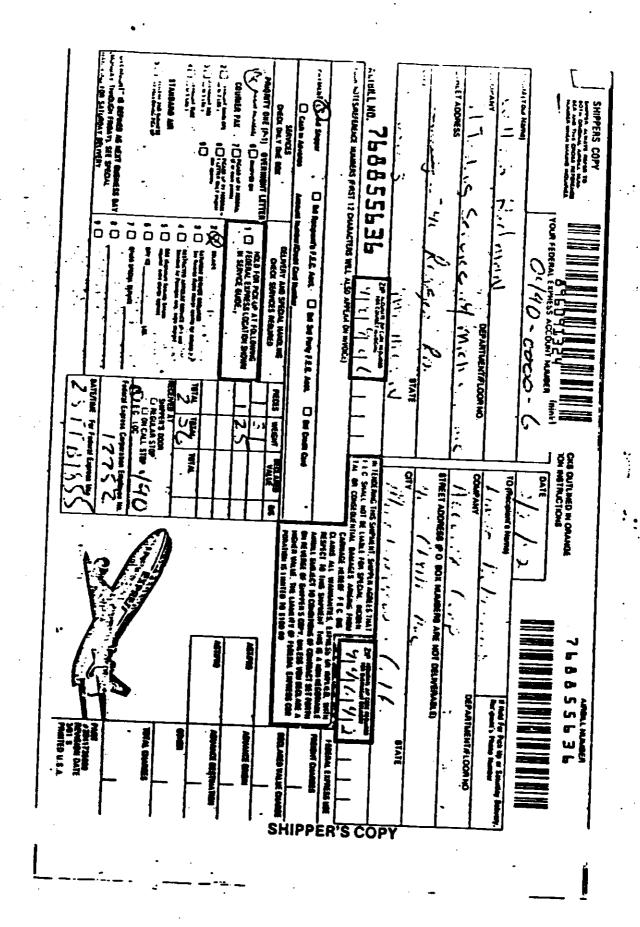
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Appendix B
Drilling Permission

Appendix B

Drilling Permission Slips

MATURAL RESOURCES CONVISCION

MICTOR A HUCFERT L E W LAITALA MLARY F DNELL PAUL H WENDLER MARRY H VANTELEY JOAN L WOLFE CHARLES G YOUNGLOVE

WILLIAM G. MILLIREN, Governor

## DEPARTMENT OF NATURAL RESOURCES

STEVENS T MASON BUILDING BOX 30028 LANSING MI 48909 HOWARD A TANNER Director

A groundwater contamination problem exists in your area. At the request of the Department of Natural Resources (DNR), the U.S. Environmental Protection Agency (U.S. EPA) is funding an investigation to determine the source of the contamination. Permission is requested to install and monitor wells on your property as part of this investigation.

The wells will be the responsibility of the DNR and will eventually be removed. We do anticipate some disturbance to your property as a result of the well drilling. We expect the disturbance to be limited to: truck tire marks, equipment storage on the ground, excavation of the well site, and some possible water and mud at the well site.

As the state agency responsible for coordinating efforts to investigate incidents of groundwater contamination, please direct any questions to:

Department of Natural Resources Groundwater Quality Section 8th Floor, Mason Building P.O. Box 30028 Lansing, Michigan 48909 Telephone (517) 373-8147

Attention: Garth Aslakson

. . . .

Please sign this permission slip and return it to me at the above address.

Thank you for your assistance and cooperation.

Very truly yours,

WATER QUALITY DIVISION

Garth Aslakson Groundwater Quality Section

GA:clp

0000103

I give permission to enter my property to construct, monitor and survey water wells. On those street right-of-ways within Emmett Township as shown on the attached drawing.

Signature (intil 13 of care 7 1 12, 1982

Address 6 30 Cliff St. 13 ittle (Sect, 17/10/149017)

Phone

616 - 968-0241



STATE OF MICHOLA

NATURAL RESOURCES COMMINSCOM

JACO A MITTERS
E V LATTALA
MILITALE PAUL H WENDLER
HARRY H WHITELEY
JOAN L WOLFE
OMARIES G YOUNGLOVE

ARLIAN A MARKEN A COM-

DEFINAL LENT OF MATURAL RESOURCES

STEVENS 1 MASON SOTTOMS
BOX 30078
LANSING MI 48909
HOWARD A TANNER Director

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\* . · .

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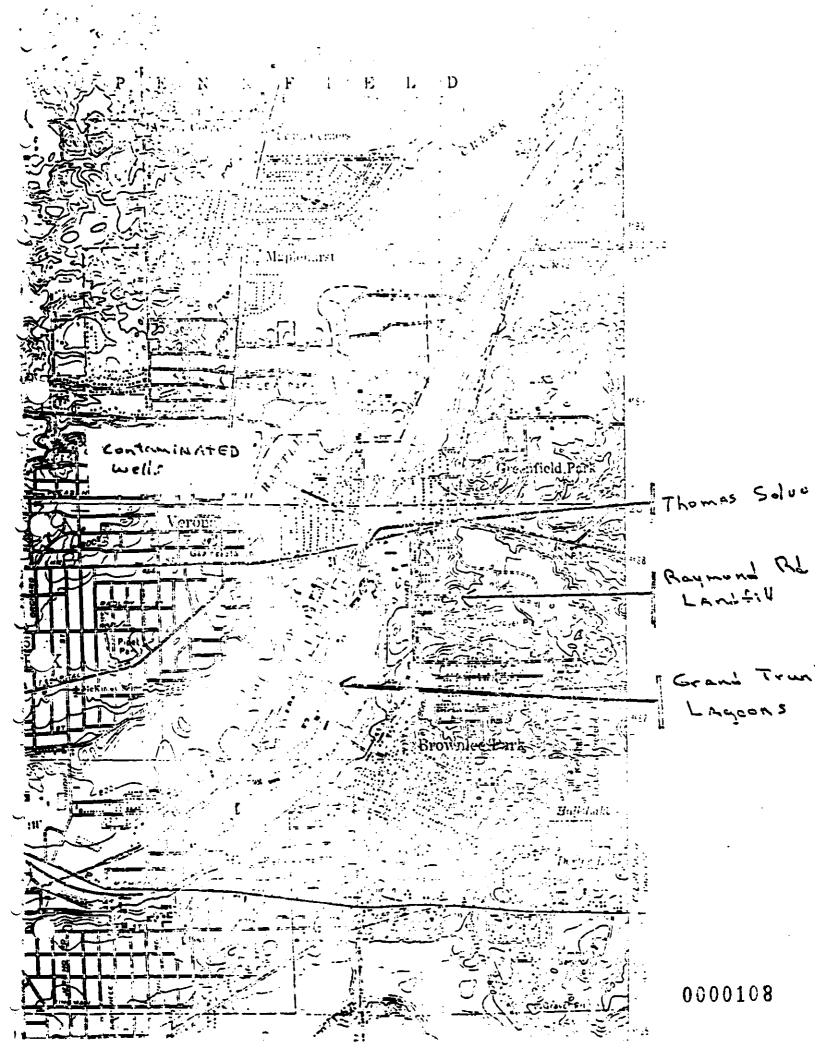
WATER QUALITY DIVISION

Garth Aslakson Groundwater Quality Section

GA:clp

I give permission to enter my property to construct, monitor and survey water wells. On those County road right-of-ways as shown on the attached drawings.

Signatur	e <u>**</u>			14 1			•.		
					Date				
Address	Calhoun	County	Road	Commission,	13300	- 1	L 5 _ 1	Mile	Road.
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MATURAL RESOURCES COMMISSION

MODE A NUTTER
E M LAITALA
MARY F STELL
PAUL N. WENDLEP
MARY M WHTELEY
JOAN L. WOLFE
... CHARLES G YOUNGLOVE

WILLIAM & MILLINER Governor

#### DEPARYMENT OF NATURAL RESOURCES

STEVENS T MASON BUILDING BOX JOICE LANSING MI 45909 MOWARD A TABBLER Director

A groundwater contamination problem exists in your area. At the request of the Department of Natural Resources (DNR), the U.S. Environmental Protection Agency (U.S. EPA) is funding an investigation to determine the source of the contamination. Permission is requested to install and monitor wells on your property as part of this investigation.

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Department of Natural Resources Groundwater Quality Section 8th Floor, Mason Building P.O. Box 30028 Lansing, Michigan 48909 Telephone (517) 373-8147

Attention: Garth Aslakson

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Very truly yours,

WATER QUALITY DIVISION

Garth Aslakson Groundwater Quality Section

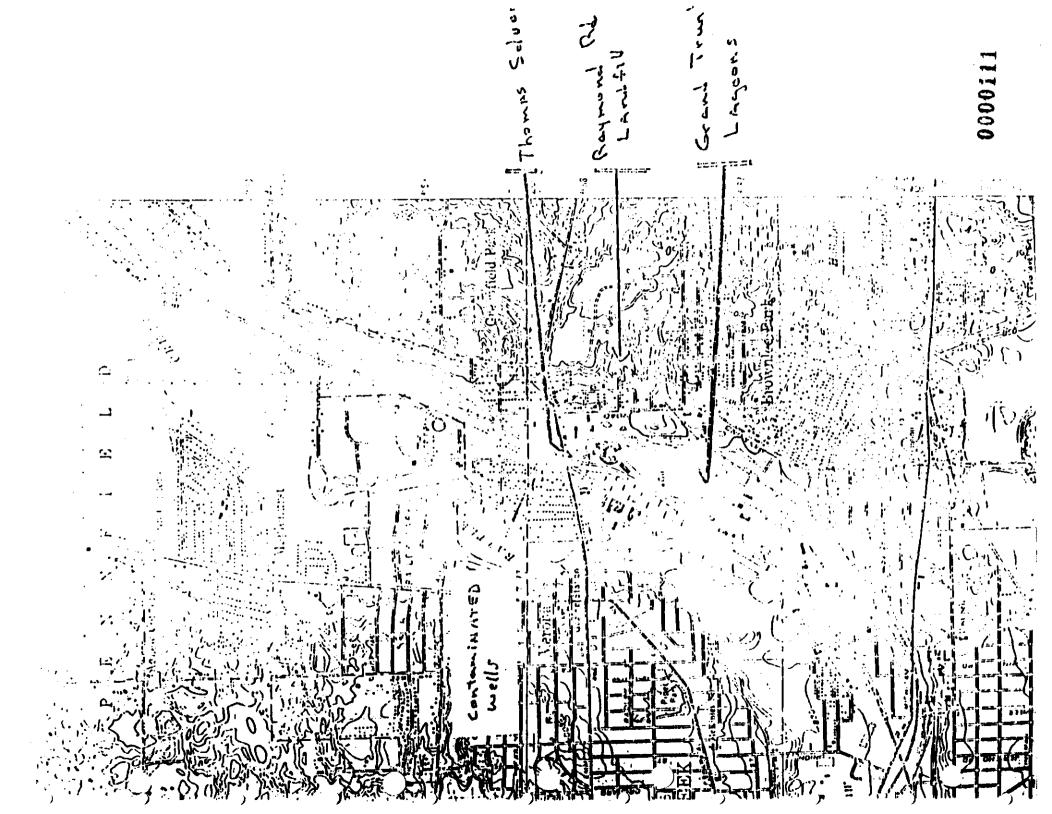
GA:clp

R1026 1/95

0000103

I give permission to enter my property to construct, monitor and survey water wells. On those street right-of-ways within Pennfield Township as shown on the attached drawing.

Address Pennfield Township Office, 20260 Capital Ave. N.E. Phone (616) 968-3549 Battle Creek, MI 49017



- J. Air. Of J. Officeda

NATURAL RESOURCES COMMUSION

E W LAITALA

MLARY F CAELL

FAUL M WENCLEY

MARK M WHITELEY

JOAN L WOLFE

CHARLES G YOUNGLOVE

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MARON HIP DING BCX 20028 LANSING, MI 49909 HOWARD A. TANNER, Director

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Attention: Carth Aslakson

\* \*

Please sign this permission slip and return it to me at the above address.

Thank you for your assistance and cooperation.

Very truly yours,

WATER QUALITY DIVISION

Garth Aslakson Groundwater Quality Section

GA:clp

I give permission to enter my property to construct, monitor and survey water wells. On those City street right-of-ways as shown on the attached drawing.

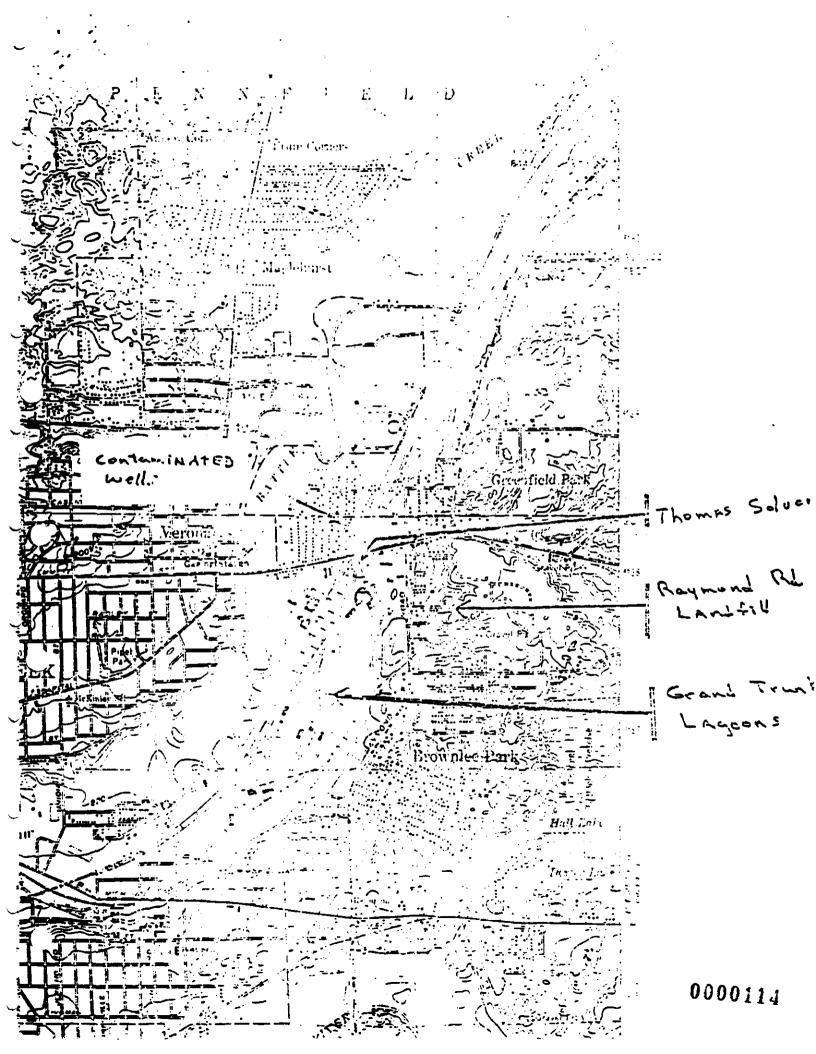
Signature \_\_\_\_\_

2-2-2

City of Battle Creek, Department of Public Works

Address Rm. 110, City Hall, P.O.Box 1717, Battle Creek, MI 49016-1717

Phone (616) 966-3407



I give permission to enter my property to construct, menitor and survey water wells.

Signature on Chitus B More 3-1-82

Address Verene Electric Company Mill Street Battle Creek MI Phone 9686062

### KELLOGG COMPANY BATTLE CREEK, MICHIGAN 49016

EXECUTIVE OFFICES

March 10, 1982

Department of Natural Resources Stevens T. Mason Building Box 30028 Lansing, Michigan 48909

Gentlemen:

Pursuant to your written request and our related discussions of today, Kellogg Company hereby grants permission to the Department of Natural Resources of the State of Michigan to enter upon the Company's property to construct, monitor and survey water wells at the following location or locations:

This permission is granted upon the explicit understanding that the Department of Natural Resources will and does assume any and all responsibility, financial or otherwise, for any injury to its personnel or personnel working under its direction on Kellogg property and any injury or damage to Kellogg or its property resulting from or related to the abovementioned well or wells, except the reasonable and unavoidable disturbance to Kellogg Company property as is approved by the Company and is intrinsically required for such construction, monitoring, and survey of the above-mentioned well or wells.

KELLOGG COMPANY

DEPARTMENT OF NATURAL RESOURCES

Title General Alent Mingers

Date March 11 1981

Title Chick Hydrogeolyylund DWR

Appendix C
Well Logs

Appendix C

Well Logs

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Sample No.		70°	T	PENETRAT Split S 6" 6"	··-	CORD	R	Qp	13.00 E	€PA	Sa	ample Des	wEATH	ER	ABBREVIATIONS F.TFish Tail W.OWash Out S.TSheiby Tube S.SSplit Spoon D.BDiamond Bit P.APower Auger H.BRock Bit W.SWhile Sampling W.DWhile Drilling B.C.RBefore Casing Removal A.C.RAfter Casing
	0	25	PA	Lost	15'	mge	-	~~	L	le n	med	5 ' an	d star	ted enoug	Removal A.BAfter Boring
	0	39	RB	Hw ca Sand Ung Ung	L. G	A.	25' P to	to so		ata	pes .				Topsoil Thickness Fill Thickness Fill Thickness CAVE IN LEVEL: While Drilling and Sampling After Boring Completion WATER LOSS: At To Percent Loss At To Percent Loss At To
<u></u>	<b>†</b>	+~	,			<del>  _  </del>	<b>-</b>	1-1			·		~		<b>_</b>

R	ELPER	dim 6		8 8	BURFACE BORING BORING TATIO OFF SE	CE ELE S STAR G COMP N T	LETED	3-3-8	<i>82</i>				LAI		MICH 21-49 SI	IIGAN 187 IZE <u>H</u>	<u>'</u>	WAT WL:/ WL:-	ER LEVEL OBSE  12-15 WS ORW  BCR  AB  24 Hr. AB	ACR Hr. AB	
10	Dept	207 th or vation				IG NO		(	QP	Ι	GPA				- 17	WEAT	HER	<del> </del>	F.TFish 1 W.OWash	Out	21
Sample No.	From		Sampling Method	Sp:	11t S <sub>1</sub>	6" Feet	lows 6"	7	<b></b>	<b>-</b> -			Samp	le Des	crip	tion			A.C.RAfte	ipoon ond Bit Auger Bit Sampling Drilling over Casing to Casing to Casing	00001
	0	39	26	H		- 3	V	sam	- ' / e	G	rave	1							DRILL CREW	CHECK LIST	
					3	5-3	9	ver.	<b>9</b> ,	3	e <u>S</u>		<u> </u>	<u> </u>	<u>√ 5</u>	<u></u>			Fill Thickness CAVE IN LEVER While Drilling Sampling After Boring	: r and	_
				In	Yes	le.d		211	il.	r	in s7	vucti	ms	0	38.	<u>s'</u>			Completion WAYER LOSS:	То	
																			Percent Loss  BOULDERS OR (  At	DESTRUCTION To	NS:
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			<u> </u>					<u></u>	<del>  _</del>												

3 7 30 30	CHNIC RILLER FLPFR	Pogen	e.	<u>.\</u> SI B	URFAC ORING	E ELEV START COMPL	/ ED ETED	2 - 2	5-3	<b>P</b> >	LANSING, (517) :	RAND RIVER MICHIGAN 321-4967	WATER WL: 12 WL:	LEYEL OBSERVATIONS  14 WS OR WE  BCR ACR  Hr. AB
				0	FF SET	T					CASING USED_35		WL:	24 Hr. AB
10	B NO.	70	77	<u>_</u> B	ORIN	G NO.	_4		CLIE	NT	EPA	WEATHER		ABBREVIATIONS F.TFish Tail (2)
	Dept	h or ation		f		ON REC			7					W.OWash Out
No.			1		lit Sp	oon Bl	lows	]		- F				S.SSplit Spoon D.BDiamond Bit
]e			hod	6"	6"	6"	6"	gth Fre	E S. F.	Ch				P.APower Auger R.BRock Bit
Sample	From	9	Sampling Method					Length Recovered in Feet	Fret	rat	Ť			W.SWhile Sampling  W.DWhile Drilling
_			S		T 2 F	'eet — Í	-	2	e c	St	Sample Dea	scription		B.C.RBefore Casing Removal A.C.RAfter Casing
	٥	315	PA	Sa	-1 4	6-4	vel	te .	35'	U4	en dense sand 1	5 45 39'		Removal A.BAfter Boring
	0	39.0	PB	++	w c		T	o :	35		<del>                                    </del>		-	
							7_							
				In	STA	Hed		اايدن	6		38.5			DRILL CREW CHECK LIST Topsoil Thickness
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TE DR HE	CHNIC	Rozer	R	Si Bi Si Oi	URFAC ORING ORING FATION FF SET	CE ELEY START COMPL N	V ED LETED	3-1 3-2	72	<u> </u>			LANSING, (517) : USED Z S	RAND RIVE MICHIGAN 321-4967	1 4w	WATE WL:_ WL:_ WL:_ WL:_	R LEVEL OBSERVATIONS  OF THE SERVATIONS  OF THE SER
101		<u> </u>	<u> 26</u>	B	ORIN	G NO.	_5	(	CLIE	NT	GPA	_	<u></u>	WEA	THER		ABBREVIATIONS CO
		h or ation	]	PENE	TRATI	ON RE	CORD	R	Qp	98							W.OWash Out S.TShelby Tube
o N			60	Spl	it Sp	oon B	lows	70 4	<del></del>	<b>∤</b> ∉ .	İ						8.8Split Spoon O D.BDiamond Bit
le le	_		11n bot	6"	6"	6"	6"	ire i	O SI	5							P.APower Auger
Sample	From	ဥ	Sampling Method					e v	a r	ata							W.SWhile Sampling W.DWhile Drilling
S	ja,	<b>F</b>	S	-	- 2 F	eet —	<del> </del>	Length Recovered	Pen tre pr	Str	<u> </u>		Sample De	scription			B.C.RBefore Casing Removal
	0	25	P.4		<del> </del>	<del> </del>	<del>                                     </del>	<del> </del>	<del>                                     </del>	<del> </del>	<del>                                     </del>		odispare sur				A.C.RAfter Casing Removal
	0		18	Hw	•		6	25'	<del>                                     </del>	<del> </del>							A.BAfter Boring
	<u> </u>	31	10	1100	San		<u>.</u>	. 0	4	2.							
						5	Trans		1		3 <i>3</i> ′						DRILL CREW CHECK LIST
		·			re		- 20	5	1		33	* ~	0.7	<del></del> _			Topsoli Thickness
					len	de	<del>                                     </del>	and	0	<u>}a</u>	4 5 Tom	<u>, 63</u>	7	······································			Fill Thickness
		 	-			<del> </del>	-	<del> </del>		<del> </del>	0	7 4					CAVE IN LEVEL:
		 			Jes .	14/	red	<u>u</u>	red1	<u> </u>	ees a	ins/r	nction	g (R) 3	7 '		While Drilling and Sampling
		ļ			<u> </u>		<del> </del>	<del> </del> _	<b></b>	<b> </b> -				<del></del>			After Boring Completion
					<u> </u>			<u> </u>	0	<b> </b>				<del></del>			WATER LOSS;
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		<del> </del> -			<del> </del>	<del>                                     </del>	<del> </del>	<del> </del> -		<del>                                     </del>	<del> </del>	_ <del></del>	<del></del>	<del></del>			ARTESIAN PRESSURE:
		-			<u> </u>	1	<del> </del>	<del> </del> -		<del>                                     </del>			<del></del>				Depth
		<del> </del>			<del> </del> -	<del> </del>	<del> </del>	<u> </u>	<del>                                     </del>	_	<del> </del>	<del></del>	<del></del>	<del></del>	<del></del>		Height of Soil Rise In Casing
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			'	•	-	•	<u>~</u>	'	' <u> </u>	'	•		w.	•		_ 1	$\sim$

R	G NO	Poge Poge Poge Poge Poge Poge Poge Poge	3 רר <del>ר</del>	B PENE	ORING TATION FF SE ORIN ETRATI	E ELE	V ED ETED CORD	3 · 2	-3 2 - 3	T M ge			<b>LANSIN</b> (517		MAE	WATE WL:_ WL:_ WL:_ WL:_	BCR LEVEL OBSERY  BCR AB  BCR AB  ABBREVIA  F.TFish Tall  W.OWash Ou  S.TShelby To  S.SSpilt Spood  D.BDiamond  P.APower As  R.BRock Bit  W.SWhile Sa	ATIONS  ACR  Hr. AB  FIONS  It CV  in CV  in CV  mpling CV  mpling CV
Sa	2	25	PA PA		- 2 I	feet —	-	Reco	Pene eter	Stra			Sample 1	Descripti	on		W.DWhile Dr B.C.RBefore Remova A.C.RAfter C Remova	Casing Daying U
	O	39	RB	Hu	C.	شمما	<u> </u>	3 9	,								A.BAfter Boi	ing
					0- J		1	San			0	3 4 '	per -				DRILL CREW CH Topsoil Thickness Fill Thickness CAVE IN LEVEL: While Drilling an Sampling After Boring Completion WATER LOSS: AtTO Percent Loss BOULDERS OR OBS AtTO AtTO ARTERIAN PRESSUR Depth Height of Soil Ri In Casing	TRUCTIONS:
		+	<del> </del>	,	<del> </del>		<del> </del>	<del>}</del> .	<u>'</u>								<u>.                                    </u>	

DI HI RI	SOIL TESTING BEHVICES OF MICHIGAN, INC.  TECHNICIAN A SURFACE ELEV.  DRILLER ROPE R BORING STARTED 315/82  HELPER BORING COMPLETED 3/5/82  RIG NO. D-53 STATION  OFF SET  Depth or DEPTH STATES OF MICHIGAN, INC.										LANSING, MICHIGAN (517) 321-4967 WL: WL: CASING USEDSIZEWL:	FER LEYEL OBSERVATIONS  /3 D ws OR D  BCR ACR  AB Hr. AB  24 Hr. AB
10			<u> 7ረ</u>	В	ORIN	G NO.	_6	A_C	LIE	11	ERAWEATHER	ABBREVIATIONS F.TFish Tall 17
•		n or <u>ation</u>	]	PENE	TRATI	ON REC	CORD	R	Qp	86		W.OWash Out 5.TShelby Tube
No			<u>∞_</u>	Sp1	<del></del>	oon Bl	.ows	70 44	Lu	Chan		D.BDiamond Bit
p 1e			11 5	6"	6"	6"	6"	Sth Feer	Tes	<b>ာ ရာ</b>		P.APower Auger O R.BRock Bit O W.SWhile Sampling
Samp 1e	From	ရှ	Sampling Method		Ĺ,	 Peet —		Length Recovered	er T	rat		W.DWhile Drilling B.C.RBefore Casing
			S					5	9 9 9 7 4	St	Sample Description	Removal A.C.RAfter Casing
1	0.0	8.0	22	2	3	4		1.5	<u> </u>		Topsoil	Removal A.BAfter Boring
IA	0.8	1.5	کک								Fix to mad Gois brown Sand	
	0.0	50	PA									DRILL CREW CHECK LIST
2	6.0	65	عي	4	5	5		1.5			Fi & Med Course Proces Soul	Topsoil Thickness -
		100										Fill Thickness
3		11.5		6	9	12		1.5	-		Same	CAVE IN LEVEL:
	1'	150	r 1									While Drilling and
J	ľ	16.5		14	20	25		1.5			Fi to Course AS Sand I'v & Some g'une! (Hap 2 12')	After Boring
								- <del> </del>			(4-0213)	Completion
												***************************************
_									2			Percent Loss
							5	1	->			AtTo
								And the second second				Persons Loss
										-	7. S. S. S. S. S. S.	SOULDERS OR OBSTRUCTION
					1							AI To
								,			-	At To
		<b> </b>				1						ARTESIAN PRESSURE:
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TE DR HE RIG	CHNIC RILLER LPER G NO	Laye Dean	- K	H S — B — B — S	URFAC ORING ORING TATION	START COMPL	/ ED .ETED	2 · 2 : 2 · 2 :	L-82				LANS (5 USED_	30	sızetu	<u>WAT</u> WL:_ WL:_ WL:_	ER LEYEL OBSERVATIONS  23-25 WS OR WD  BCR ACR  23' AB Hr. AB  24 Hr. AB
101	B NO.	30)	<u>) 6</u>	B	ORIN	G NO.	<u> 7                                    </u>	(	LIE	NT	CPA				WEATHE	R	ABBREVIATIONS C
	Dept Elev	h or	]	PENE	TRATI	ON RE	CORD	R	Qp	86							W.OWash Out
N O			<b>36</b>	Sp1	it Sp	oon Bl	.ows	77.4		٦ ⊏							S.SSplit Spoon OD.BDiamond Bit
]e	_		11 Po	6"	6"	6"	6"	d i i	0.8	5	Ì						
Sample	rom	ုန္	Sampling Method					Length Recovered in Feet	1111	trata							W.SWhile Sampling O
S	(a,	1	Sa	-	├ 2 F	eet —		7 2 2	le en	Str			Sample	Desc	ription		B.C.RBefore Casing Removal
	0	38.5	D <sub>A</sub>		-			<del></del>			-1 -					t	A.C.RAfter Casing Removal
	0			13	•	<u> </u>	6	uvel	10		<u>T</u>	164	1627	04	se Sano	7	A.BAfter Boring
<del></del>	0	39.0	CD	H-7	12 C	-	1 CO	30			ļ	<del></del>					
		<u> </u>	<del> </del>	10	<del></del>		<u> </u>	<del>                                     </del>									DRILL CREW CHECK LIST
	-		ļ	7	ST	llea	L	1100	pe		nst	ucti	0 45	<u></u>	39	<u></u>	Topsoil Thickness
											<u> </u>	<u></u>			<u> </u>		Pill Thickness
																	CAVE IN LEVEL:
											5			•			While Drilling and Sampling
								C	<b>J</b>								After Boring
							_						··· <del>·</del>				Completion
										<u> </u>		<del></del>					WATER LOSS:
	<u></u>	<del> </del> -			<b></b>					<del>                                     </del>							<b>▲t</b> -To
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		ļ														<u> </u>	BOULDERS OR OBSTRUCTIONS
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																	ARTESIAN PRESSURE:
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	NO.	Lange Lagor Lange James Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja Ja	76	PENE	FF SET ORIN	<u> </u>	9 cord	C	LIE! Qp	NT eg	LANSING, MICHIGAN (517) 321-4967  CASING USED 15 SIZE HW  EPA WEATHER	
Sample	From	J.	Sampling	6"	6" - 2 F	6" eet -	6"	Length Recovered in Feet		Strata Ch	Sample Description	P.APower Auger R.BRock Bit W.SWhile Sampling W.DWhile Drilling B.C.RBefore Casing Removal A.C.RAfter Casing
	<u>0</u>	<del>                                     </del>	PA KB	Sang	169	tive!	10	13.5	.Ue	<del>')</del> -	buse Send to 97	Removal A.BAfter Boring
						,	173 / 1			21	Revinstructions @ 31.5'	DRILL CREW CHECK LIST Topsoil Thickness Fill Thickness  CAVE IN LEVEL:  While Drilling and Sampling  After Boring Completion  WATER LOSS:  At To  Percent Loss  At To  Percent Loss  BOULDERS OR OBSTRUCTIONS:  At To  At To  ARTESIAN PRESSURE:  Depth  Height of Soil Rise In Casing
		<del>                                     </del>	<del>                                     </del>	ļ			<del> </del>					

		Bm		BC BC ST	DRFAC DRING DRING DRING	CE ELE S START G COMPI IN	V 'ED LETED		8-8 8-8	2		LAN	IBING, M (517) 321		WA] WL: WL: WL:	IER LEYEL OBSERVATIONS  AS - CO WS OR FD  BCR ACR  AB Hr. AB  24 Hr. AB
10		707	76	8(	DRIN	IG NO.	10	(	CLIE	NT	E PA			WEATHE	R	ABBREVIATIONS F.TFish Tail
	Dept	h or				ion re		R	Qp	1				•		W.OWash Out S.TShelby Tube
9				Spl	it S	poon B	lows	<del>}</del>	<del></del>	ange						
1e	_		F P	6"	6"	6"	6"	re c	S S	ម						P.APower Auger
Sample	From		Sampling Method					eng o	r T	ata						W.SWhile Sampling O
Ś	(24,	្ន	S	-	<b>– 2</b> :	Peet -	<del> </del>	Length Recovered	er en	Str		Samo	le Desc	ription		B.C.RBefore Casing Removal
	0	25	PA		•	<del></del>	<del> </del>			<del></del>	<del> </del>	Jamp.	re peac	TPCION		A.C.RAfter Casing Removal
		+	<del></del>	14.		اعت	<del>  -</del>	-	<del> ,                                    </del>	<del>                                     </del>	<del> </del>	· - · · · · · · · · · · · · · · · · · ·	<u></u>	<del> –</del>		A.BAfter Boring
	0	34.0	KD_	174	<u>,                                    </u>	<u> </u>	1 6	35	├	<del>                                     </del>	├			<u> </u>		-
	<del>                                     </del>	<del> </del>				<del>                                     </del>	<del></del>	<del> </del>	╁	_	ļ				<del></del> -	DRILL CREW CHECE LIST
	<u> </u>	<del> </del> -	-			<u> </u>	nd	\$ 6,	-	<u> </u>	to 34	<del></del>				Topsoil Thickness
	<del> </del>	<del></del>	<b></b>				<del> </del>	<del> </del>	<b> </b>	<u> </u>					<del></del>	Fili Thickness
		<b> </b>	<u> </u>			120	11-0	4 4	<u>lel</u>	6	30	<u> </u>				CAVE IN LEVEL:
		ļ. <u></u>	<u> </u>						<u> </u>	_	ļ. <u></u>					While Drilling and Sampling
		<u> </u>					<u> </u>	<u> </u>								After Boring
								(	-	1	5					Completion
																WATER LOSS:
						<del> </del>							···		· · · · · · · · · · · · · · · · · · ·	At To
		<del> </del> _	<del>                                     </del>			<del>                                     </del>	<del>                                     </del>		<del>                                     </del>		†					At To
		<del> </del> -	_			<del>}</del>	<del> </del>	<del>                                     </del>	<del> </del> -	_	<del>                                     </del>			<del>, , ,</del>	<del></del>	Percent Loss
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	ļ		<u> </u>				<b>}</b>	<del> </del>	<del> </del>	<u> </u>	ļ					ARTESIAN PRESSURE:
		<del> </del>	-			<del> </del>	<b> </b>	<del> </del>	<del>  -</del> -		ļ					Depth
		ļ			<u> </u>	<u> </u>	<del>                                     </del>	<u> </u>								Height of Soil Rise
	<u></u>	ļ				ļ	<u> </u>		ļ	<u> </u>				<u></u>		In Casing
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	<u> </u>						<u> </u>		1					<u></u>		1
	~	,	`	, 7		1	1	1	T	· —	1		-	<u> </u>	_	

T1 Di Hi	OIL TI ECHNIC RILLER ELPER IG NO	Roger	R	\$\ 8 8 \$	URFAC ORING ORING TATION	START COMPL	V ED .ETED	3// 3/	5-1	82 192		2710 N. GRA LANBING, N (517) 32 G USED	IICHIGAN	<u>WATE</u> WL: WL:	ER LEVEL OBSERVATIONS  WS OR WD  BCR ACR  Hr. AB  24 Hr. AB
10	B NO.		76	8	ORIN	G NO.	11		LIE	NT	EPA		WEATHER		ABBREVIATIONS FT-Fish Tail
		h or ation		PENE	TRATI	ON RE	CORD	R	Qp	se 8e					W.OWesh Out S.TShelby Tube
0				Spl	it Sp	oon B	lows			<b>↓</b> ⊆					8.8Split Spoon O.BDiamond Bit
Je	_		ampling Method	6"	6"	6"	6"	e e	e s	5					P.APower Auger
Sample	From	g	e E					n o a	ret	at	1				W.SWhile Sempling W.DWhile Drilling
S	[24	14	S. T	-	+ 2 F	eet —	<del>                                     </del>	Length Recovered in Feet	Pen	Str		Sample Desc	ription		B.C.RBefore Casing Removal
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Appendix D Spills Appendix  ${\cal D}$ 

0000137

# SPILL REPORT from BATTLE CREEK FIRE DEPARTMENT

#### August 29, 1978

Warehouse fire on Jamison Avenue on Grand Trunk. Bugged chemicals:

Chloride Flakes Killer Weed (1,000 lbs.) Dearborn Treatment Dearsol No. 80 (1,000 lbs.) Acid Cleaner (6,000 lbs.)

Run-off ran into the collection pit. DNR on scene. Materials generating most of the smoke was Sodium Chromate.

An old train repair at 200 Elm Street just off East Michigan Avenue.

Appendix H
Background Information

## Errata Page to Battle Creek Groundwater Study TDD 5-8201-1

Please add the following section from the MDNR dated April 13, 1982 to the background information section in Appendix H.

#### MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

April 12, 1982

RECEIVED APR 1 5 1982

Groundwater Qual., WQD

TO:

William Iversen, Groundwater Quality, Water Quality Division

Roger Jones, Water Quality Division, District II RF

SUBJECT: Contaminated Public and Private Water Supply Wells in the

Battle Creek Area

On March 15, 1982, I collected split spoon soil samples in Battle Creek during the installation of monitoring wells #12 and #11 by USEPA's Technical \* Assistance Team. Soil samples were also collected from a boring located near monitoring well #6. The results and a map are attached. My field notes and interpretations of the sample results are below.

#### At Monitoring Well #12

The soil to a depth of 11 feet was black silty/sandy with some cinders in it. Water was encountered at a depth of 12-1/2 to 13 feet and the soil at this depth was fine sand with fine gravel in it. Soil samples were split here and at the other locations with Mr. John Dourjalian of the Technical Assistance Team. Mr. Walter Matyasic of the Kellogg Company was also present for awhile during the drilling. No Scan #1 and Scan #2 parameters were detected in the soil here. However, while assisting Mr. Dourjalian in collecting water samples from monitoring well #12 on March 16, 1982, we observed that the water was cloudy and had patches of film on the surface (when viewed in a jar).

#### Near Monitoring Well #6

The top one foot of soil here was black with some sand in it. Below one foot to about 16 feet the soil was mostly a brown sugar colored sand. At 16 feet the soil consisted of light brown moist sand with gravel (1/2 pea size) interspersed in it. No unusual odors were noticed in the soil at any depth.

I have spoken with Jim Bedford about the sample results here. The concentrations of volatile organics found in the free liquid over the soil would be about one tenth of the ug/kg value indicated on laboratory form. Therefore, the chloroform results indicate that only a trace of this compound was detected in the liquid for each depth. Note also that the letter J on the laboratory form denotes that a value is an estimate (and may not be accurate). Mr. Bedford felt that the chloroform results were not very

William Iversen April 12, 1982 Page 2

significant, but he did think the TCE and PCE results here were significant. It should also be noted that chloroform is the most volatile of all the compounds detected in the March 15 soil samples (i.e. losses of chloroform to the atmosphere during sampling may have been greater than the losses of the other compounds to the atmosphere).

#### At Monitoring Well #11

The first 12 inches of soil here was black and gravelly. The next six inches of soil consisted of dark brown sand. From 6 feet to 11 feet the soil consisted of light brown sand. Water was encountered at a depth of 11 feet. No unusual odors were noticed.

#### Water from Well #5000

This is a blank. Demineralized water from the laboratory was placed in the vials by using the squeeze bottle and funnel that had been used while collecting and preparing the other samples.

Note in the sample results that the sample (at well #11) collected before the blank was prepared showed 1,1,1 TCE to be present. It is possible that there may have been a trace amount of cross contamination from that sample to the blank via the funnel which previously held the 1,1,1 TCE contaminated soil. The funnel was rinsed with demineralized water between samplings. However, it is possible that a soil particle remained on the funnel to be washed into the blank.

Pictures were taken at each site where samples were collected. They have been developed, and if you need them, please let me know,

On March 15, 1982, one monitoring well at the Raymond Road Landfill was also sampled. There are supposed to be three monitoring wells here. One was dry (on March 16, 1982) and the owner (Mr. W. Carter) and I could not find the third one.

The well that was sampled was about 51 feet deep and was bailed 19 times with a 2"x 4' bailer before sample collection. I collected a one gallon jug of water and 2-40 ml. vials of water and gave them to Mr. Dourjalian (custody sheet attached). The water from this well was clear on the first bail, but gradually turned a coffee with cream color and stayed that way. This well is located about 200 yards east from the landfill office along the entrance road and then about 80 feet south of this road.

RJ/sp cc: J. Bohunsky (WQD File) xc: S. Ostrolka
T. Newell
T.A.T.

a. Cummings.

C.WEAULT R. Wirsing / J. Lovate

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### MICHIGAN DEPARTMENT OF NATURAL RESOURCES TRANSMITTAL OF EVIDENCE AND LABORATORY ANALYSIS

To:   Michigan State Police Cime Laboratory   Discrete Cime Laboratory   Michigan Dept. of Public Health   Discrete Cime Laboratory   Conservation Off   Discrete Conserva		· · · · · · · · · · · · · · · · · · ·	: h	er Lagation '	C.ÇASE NUM	BER	
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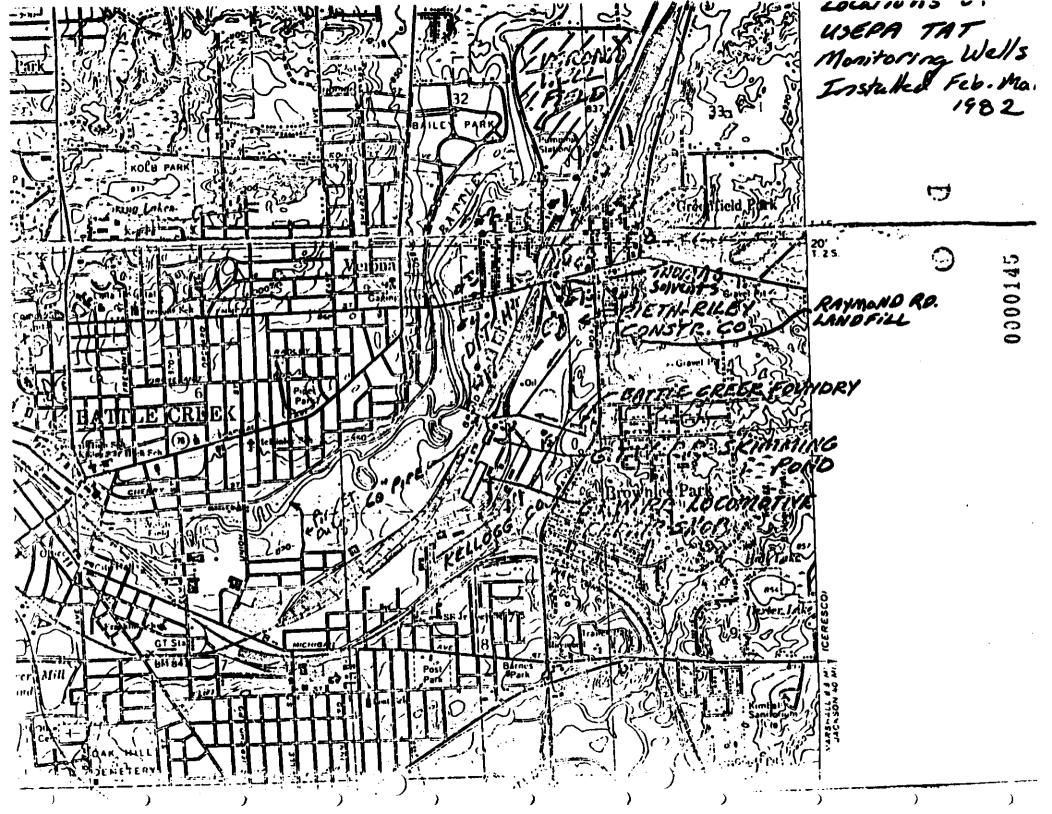
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R 8103

## TRANSMITTAL OF EVIDENCE AND LABORATORY ANALYSIS

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ESD-01303 REV. 12/79



#### WILLIAM G. MILLIKEN, Governor

#### DEPARTMENT OF PUBLIC HEALTH

3500 N. LOGAN P.O. BOX 30035, LANSING, MICHIGAN 48309

. April 13, 1982

0450

City of Battle Creek Water Department East Michigan Avenue Battle Creek, Michigan 49014

Attention: Mr. LaVerne Serne, Director of Public Works

Subject: Water Supply - Battle Creek

Sampling Results

Gentlemen:

Please find enclosed with this letter the results of analyses conducted on water samples collected from the Battle Creek water supply. These samples were collected on April 6, 1982 as part of the weekly sampling program and were analyzed for volatile, halogenated hydrocarbons.

No significant changes in the concentrations of organic chemicals in the two wells being pumped to waste (Well No. 32 and Well No. 35) are indicated by these results. The plant tap sample results continue to show no presence of the chemicals or only trace amounts of one or two of them. The sample from Well No. 43 showed no presence of the organic chemicals as was the case in previous sampling.

It should be noted, however, that analyses of the sample from Well No. 20 showed the presence of 1,1-dichloroethane, 1,1,1-trichloroethane, and perchloroethylene. This well had not been previously found to be affected. The total number of wells in the Verona Wellfield which have been shown to be affected by groundwater contamination is now 14. The number of affected wells has increased by four since the wells were first sampled in September of 1981. We continue to advise the city to limit the use of these wells.

We have become concerned about the ability of the Battle Creek water supply to meet increasing water demands. In addition to seasonal increases in water demand, additional demands are now being placed on the water supply by the Kellogg Company. The Post Division of the General Food Corporation may also be increasing their demand for water from the Battle Creek water supply system. A review of our records indicates the remaining unaffected wells should provide adequate capacity to meet the additional demands. However, should more wells in the Verona Wellfield become affected, the ability to meet demands without using one or more of the affected wells may be doubtful.

City of Battle Creek Page 2 April 13, 1982

We recommend that the city carefully evaluate this situation. Consideration should be given towards the courses of action the city may be required to take in order to continue to provide a safe drinking water while adequately meeting water demands. The city should also consider additional pumping of wells to waste to help protect the remaining unaffected wells.

We are awaiting completion of the Environmental Protection Agency Technical Assistance Team report. When this report becomes available, a meeting of the Task Force will be called to discuss the findings of the report and the future actions of the agencies involved.

We very much appreciate the cooperation of the city in this most difficult situation. If you have any questions or are in need of assistance, please feel free to contact this office.

Sincerely,

RIMW

Richard M. Wirsing
Acting District Engineer
Division of Water Supply
Bureau of Environmental and
Occupational Health

RMW:ak Enclosures

cc: William A. Kelley, P.E.

cc: Don Keech/Joe Lovato

cc: Mr. Larry Osborne, Public Utilities Engineer

cc: Russell Schuler, Verona Pumping Station Superintendent

cc: Task Force Members:

Mr. William Iversen, Water Quality Division, DNR Mr. Albert Hafner, Food and Dairy Division, MDA

Mr. Ray Cummings, U.S. Geological Survey

Mr. Steve Ostrodka, U.S. Environmental Protection Agency

Mr. Ted Havens, Calhoun County Health Department

Mr. Don Thomason, Kellogg Company

Mr. James Schwartz, General Foods Corporation

Mr. Gordon E. Olivier, Division of Water Supply, MOPH

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FROM:

Division of Water Supply

Regional Engineer P.E.

Through:

Richard M. Wirsing, Acting District Engineer  $\mathcal{R}. oldsymbol{\mathsf{U}}$ 

0450

February 11,

SUBJECT: Battle Creck Area Groundwater Contamination Meeting with the Kellogg Company

Battle Creck area. regarding the groundwater contamination affecting wells in the interested. Kellogg Company, Battle Creek Plant, called this office a meeting. February 9, to share with us and He said that they had some information that re with us and any other parties we felt might be Mr. Thomason indicated that they had information 1932, Don Thomason, General Plant Manager information they would to request

dance is attached. Calhoun County Health Department, City of On Tebruary 10, **Battle** in Battle , 1982, Creek, representatives of the Kellogg Company, the Department Creek. tment of Natural Resources, the t, and this office met at the A list of names of those in at those in atten-

the company's five wells were found to cont determined were 1.4 ppb, 10.4 ppb, 8.3 pph ethylene was also suspected to be present, quantified or specified which samples were well as for drinking purp company facilities using the company's five wells system. Verona Wellfield which serves the newspaper articles regarding the partial samp i ed Thomason informed us The company uses water at the their wells purposes. for trichloroethylene gas chromatographic at this meeting that the The analyses partial contamination of the City of Battle Creek water supply plant contain TCE. Con pph and 173 ppb. however, suspect. were conducted at techniques. Ħ (TCE) as a food processing, as Kellogg Ccmpany it was Concentrations Dichloro-Four result of not

3, 1981. Prior to this decision, the company obtained approximately 50% of their water needs from the Battle Creek water supply and combined source of diately begin Upon learning it with the begin using f water for these <u>a 1</u> 1 the results, flow from their wells. Dattle Creek water supply as their sole uses: This decision was made on December the Kellogg Company decided to imme-

expressed a desire to assist the company. roles of each of the government agencies presently involved in groundwater contamination investigation was explained to the pany. The findings to date were also discussed. The company ≓ e company SPA requested investigation in any way they to provide the following:

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Groundwater Qual, ViQO

A-21 11/7

- 1. All available information regarding their wells (location, construction, well logs, water levels, etc.).
- 2. Information regarding the techniques used to conduct the water analyses.
- Make arrangements to allow sampling of their wells without having to pump directly into the plant distribution system (pump to waste).
- Identify any possible sources of contamination they might suspect.
- 5. Investigate the possibility of granting permission to the EPA Technical Assistance Team or the EPA Federal Investigation Team to drill monitoring wells on company property.
- 6. Contact the Michigan Department of Agriculture and inform them of the findings and the actions taken.

Mr. Thomason indicated that they would attempt to comply with all requests dependent upon legal advisement.

The company is also considering the possibility of issuing a news release regarding this matter. It was indicated that any news release issued would emphasize that the Kellogg Company had begun using the Battle Creek water supply as their sole source of water, that the Battle Creek water supply is sampled weekly by the Michigan Department of Public Health; and that the Kellogg Company was offering their assistance to the groundwater contamination investigation.

#### RMW:ak Attachment

cc: Mr. Jim Cleland cc: Mr. Don Keech cc: Mr. Joe Lovato

cc: Mr. Don Thomason, Kellogg Company

cc: Mr. John Hesse, Chemicals and Health Center

cc: Contact Persons:

Calhoun County Health Department - Mr. Ted Havens

City of Battle Creek - Mr. Larry Osborn

Department of Natural Resources - Mr. William Iversen

Department of Agriculture - Mr. Albert Hafner U.S. Geological Survey - Mr. Ray Cumming

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	8 1733	300! behind leading dock in parking lot 60!	16"	1191	39
	8 105	north of plant "rock" (kee puris)	14"	113'	36
<u> </u>	9 1734	in # 2 porking lot, N. B # 2 BLDG "rock"	. 14"	112'	
	10 1955	"N.E. cover & back parking lot "rock"	J5"	106'	33
	11 1945	75 E of parking lot, in #6 wear pit	, • ·	113	34
<u> </u>	11 184	(new pump)	) 12"	83	21
-	- 1		1		

## WELL & PUMP INSPECTION REPORT

DANER Kellogg Company							
Battle	Creek			STAT	E Michigan		
WELL NO	LOCATIO	ON 300, P	ehind load	ding dock in par	king lot		
₹ 16°	DEPTH_		TYPE WEL	<u> </u>	TLAR		
SCREEN I.D.	16"SCREE	N LENGTH	PE	TH TO FOR SCREEN	SCREEN		
DATE DRILLED	1933	DATES C	F CLEANING	liner 1946,72,7	6		
NATE INSPECTE	TATE INSPECTED 5/9/78 PERSON TO CONTACT Russ Joslyn						
CONTACT LOCA	CONTACT LOCATION At Plant						
	DATE	STATIC	G.PM.	PLASPING	PRESSURE .	SPECIFIC, CAPACITY	
ORENAL			900	NO OTHER DATA	AVAILABLE		
CLEANING CLEANING CETER LAST	1976	(391)	984	52'		75.6	
TEST LAST						· .	
PRESSURE	1978	45"	737	55'	122#	73.7	
YEST WILL BE	COMPLETE T	HROUGH: TO	POF CHECK	METER_	FLANGE (	OR 538 4*	
				VOLTS			
PULIP MFG	Peerless		SERIAL NUI	MBER 33961	AIRLINE LE	NGTH	
RY ED CAPACIT	ry: 1000	GP.M.;	300'	TDH.; OPERAT	ING PRESSURE		
DATE INSTALLE	D 1953	DATES	OF OVERHA	UL 1964,72,76,53		175 05	
IS CHECK VALVE	LEAKING ? Y	ES NO_	DOES S	TUFFING BOX HAVE	SPRINGS?_noP	SIZE OF ACKING	
				ACH INSPECTION:			
CHANGE MOTOR	OIL & GREA	SE <u>*</u>	REPA	CK PUMP	GREASE PUMI	Px	
(ploce check ma	rk when compl	leted)					
				-		FT.	
ELECTRICAL C	DATA WITH P	PUMP IN OPE	RATION 10	0-100-105 AMPS:	480 YOL	TS: 3 PHASE	
<b>→</b>	MATERIALS NEEDED TO CLEAN WELL:						
	·						
						lts.	
·							
<del>_</del> .	INSPECTED BY Tony J. Ross						

DITE COMPLETED 1933 • 16" SIZE OR DIALETER FINISHED DEPTH. SURFACE TO BOTTOM LOCATION OF WELL CASED WITH 16" PIPE TO 601. SCREEN DIAMETER LENGTH . PARE AND TYPE OPENING OR SLOT SIZE FITTINGS FORMATIONS ENCOUNTERED 0 - 24 FILL (CINDERS) 4. Installed: 49 SAND 24 -10-STACE STERLING PUMP . .8" FLANGED COLUMN 51 CLAY " EUCTION 1200 RPM, 440/3/60 51 -60 SHALE & SANDSTONE 60 - 111 GREY SANDSTONE 111 - 119 SHALE . APPROXIMATELY 900 GPM.

TOTAL DEPTH PENETRATED

STATIC OR NORMAL WATER LEVEL FROM BASE OF MACHINE

PULPING TEST

DRAVIDOVIN

FT. AT . GPM.

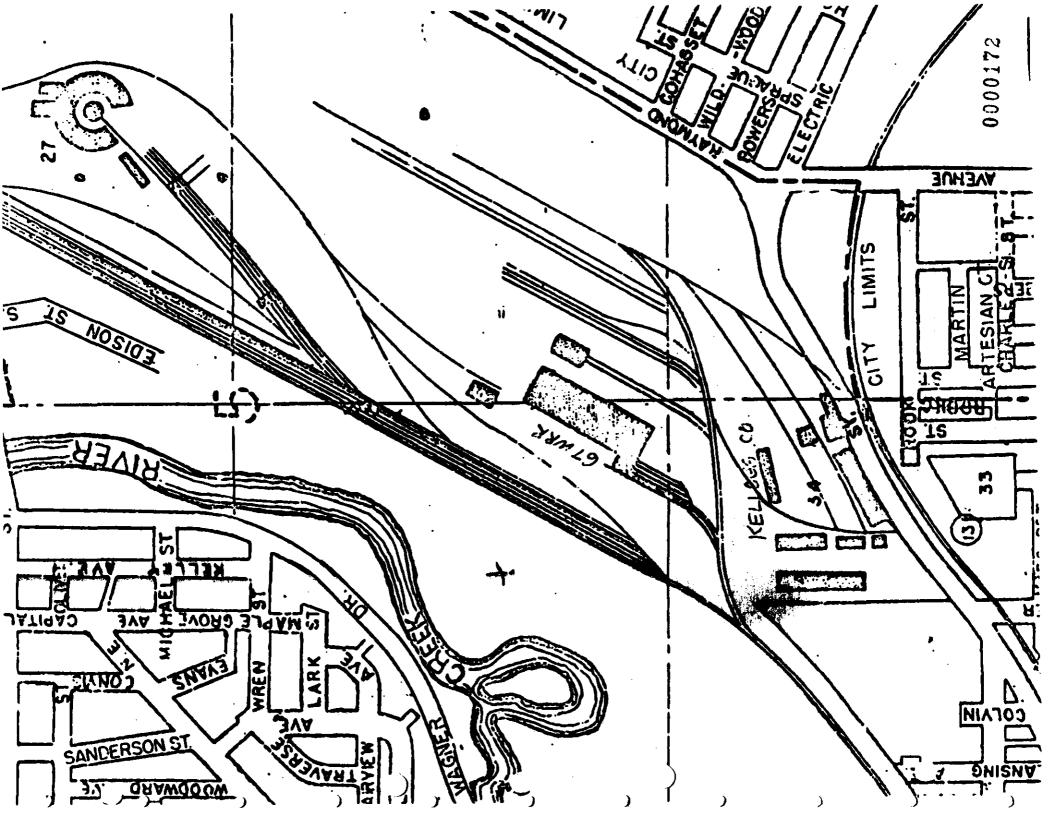
PERMANENT WELL INFORMATION. AS INSTALLED

- 1964 Well tested, static 37'4" (#9 off), 41' (#9 on) pumped 888 GPM, 11' of DD, spec. cap. 80.7.
- 1972 Well cleaned, static 44', pumped 1016 GPM @ 57' PL, spec. cap. 78.1.
- 1976 Well cleaned, static 39', pumped 984 GPM @ 52' PL, spec. cap. 75.6.

0. Order No	Dole 3-5-76
Fump Mig. Pecrless	Serial No. 33961 Well No 8
Owner Kellogg Co.	City Battle Creek Stole Mich
MOTOR: Male US	10ck 300! north of plant in parking lot  1ype HV Frame 1504P Ser. No. 1305919  1200
•	Line Vollage Phase RPM
GFAR	hop at this time? <u>yes</u> Where? <u>Alectrico</u>
	Serial No Gear Ratio
ENGINE: Mole	Model Serial No
	PUMP HEAD Type 14 S. S. COLUMN Pipe Size 8"
	Discharge Pipe Size Flanged Coupled _X
	LocatedBhave above ground Special Paint?
	Flanged X Threaded Oil Lube Water Lube X
TTTT	Separate Base Plate? <u>no</u> Shaft Size <u>1_15/16</u> SS <u>X</u> or CS
	Head Shaft Length 7: 13" Tubing Size none SH or Br
10 Jop Piece	Dio. 1 15/16Coupled below
~     <del>      -   -                       </del>	MOTOR SHAFT: Die Length SUCTION PIPE Size 8"
6 Center	Thread Size in Head Keyway   Length Q.* Special Paint?
tength Pieces	PUMP BOWL Type 14 MA Threads on Bottom? NO
long Eoch	Dia. 14 Ne. of Stages 10 Strainer none Size
	Bowls - Cost Iron or Bronze? <u>bronze</u> Rubber Bumper? <u>none</u>
Length	Shaft - SSX CS Length   Well Seal? none
Boltom Piec	
_ <del></del>	Inside Dio. 14 Depth 113 Static 36 Type: Rock rock
~ I ()	Air Line Length 80° Strapped to Column?
Longth (	Type AirlinePlasticCopper TubingX_ Steel Pipe
	PUMPING TEST - Pumped 984 GPM at 521 Ft. Pumping Level
	with 1054 lbs. discharge pressure ofter hours.
1 1 6	Pump to Waste Outside Inside Size THD.O
	PULLING INSTRUCTIONS
	Length of Poles required Special equipment or pulling
. — <u>I</u> ——∀	instructions 8" wood clamps
	Power Lines: 20° avev
activate. Valla to toma min-	
RF"ARKS: Have to turn pump To run maint test	t there is a 4" spool to take out.
	Installer Mike Garrage
• •	Installet Programme and a second of the seco

### HISTORY OF PEERLESS PUMP #33961

- 1947 Pump #33961 ordered.
- 1953 Installed new, rated 1000 GPM @ 300' TDH. Motor overhauled.
- 1963 Installed new 100 HP, 1200 RPM motor.
- 1964 Pump pulled and overhauled, strainer removed.
- 1972 Pump pulled and overhauled, motor and Kingsbury unit overhauled.
- 1976 Fump pulled and overhauled, motor and Kingsbury unit overhauled.
- 1977 Kingabury clutch repair after pump was started against a closed valve, impellers also raised.



Ruddle boch door In the man shop Crost on top (white) - mothing would grow on it. would hill moquitor for I sumon . pho) with let to minds Charle Boyle - speed with the swamp. Stron of our bout. Red . Jet red in + pile it 5' doep 1650 - 1620 - "Anny" Don't grew to tracks Hout believed office, poor tooks Putch out onto a cupfer Jung all leguel out - oure to re- use To elem metal befor puting babbit on learnings human way who had here be said to Maharus R caroles to come 50g61 barise line morte. Clear legish - doil breath

### CALHOUM COUNTY HEALTH DEPARTMENT

Division of Environmental Health

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station.	
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MEMORANDUM

TO:

Mr. William Iverson

Department of Natural Resources

DATE:

February 8, 1982

FROM:

Richard M. Wirsing RMW Division of Water Supply

0450

SUBJECT:

Battle Creek Area Sampling Results

Please find attached copies of the results of analyses conducted on water samples collected on January 22, 1982 from privatelyowned wells located in the vicinity of the Verona Wellfield. These results continue to show wells in the residential area south of the wellfield to be significantly contaminated.

**⋠It should also be noted that two (2) samples were collected from** wells located near the Raymond Road Landfill. These samples were found to contain low concentrations of CIS-1,2-dichloroethylene, trichloroethylene, and perchloroethylene. Further sampling of wells in this area will be conducted.

RMW:ak Attachments

> RECEIVED FEB 1 0 1982

Groundwater Qual., WQD

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Bureou of Disease Control and Interestery Services

Verona Pumping Station February 5, 1982 10:00 am.

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NAME FIRM O AGENCY RELLOGG CO. DON I Homasow GENERAL PLANT MANAGER Rosalyn Franta Dir, Nutrition 9 Analytical Suco. Kellogg Thua Jake Ngs. Safety + Environmental Walth Kellong, favene Lome Cty of B.C. Die of Pub. Works Glavy A. Osborn Public Utilities Engineer City of Battle Greek Oscoy Wollerman Kelloss G. V. P. Public Atairs TED HAVEN'S

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CALHOUN COUNTY

HENCTH DEPT

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John A. Heppeard

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FURDON C, OLIVIER

Toe Lovato Geologist

Richard Wirsing Engineer Jan. M. INERSEN

Med Din- Pose Harin

は is マガ Second October 2 MDPH WAGI Supply Devision Dept of Hatwal Resonances

DEPARTMENT OF PUBLIC HEALTH S. Reizen, M.D. Director

MEMORANDUM

10:

William A. Kelley, P.E.

Gordon E. Olivier, P.E. THROUGH:

FROM:

Richard M. Wirsing RHW

DATE:

January 15, 1982

0450

SUBJECT:

Water Supply - Battle Creek

Extension of Service to Replace Contaminated Wells

On January 14, 1982, a meeting was held in Battle Creek to discuss the possibility of extending the Battle Creek water system to serve an area in which groundwater has been found to be contaminated with organic chemicals. The area affected includes adjacent parts of Pennfield Township and Emmett Township. Present at the meeting were representatives of Battle Creek, Pennfield Township, Emmett Township, the Calhoun County Health Department, the Calhoun County Department of Public Works, and this office. A list of those in attendance is attached.

At this meeting, representatives of the townships decided to jointly retain a consultant engineer to provide a project proposal and cost estimate for the installation of water mains. Possible funding options will also be investigated. The details of any financial arrangements between the townships regarding the sharing of costs will also need to be determined.

The city is also being very cooperative in this matter. They have recently reduced their tap-in fees from \$400 to \$175. This reduction will remain in effect until November 15, 1982. A few residents in the affected area are presently able to tap into existing mains. The city has also provided hours in which residents in the affected area may obtain water at the Verona Pumping Station. The city is sending letters to owners of wells which have been identified as being contaminated to inform them of this service. A copy of one of the letters is also attached.

RMW: ak

Attachments

cc: Don Keech/Joe Lovato

XC: Larry Holoood, 75CC
Rich Powers, DNR
Audy Hojonth, DNR
Burt Cuduell, MDi:
B:11 Rustem, Ex. Off.
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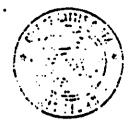
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DIRECTOR OF FUSILIC WORKS



ROOM HIG CITY HALL

January 8, 1982

Mr. Arthur Eifler 46 Maxwell Battle Creek, MI 49017

""SUBJECT: WATER FOR DRINKING PURPOSES

Dear Mr. Eifler:

Our records indicate that recently you received a letter from the Michigan Department of Public Health containing the water sample analyse of your private well. In that letter the Michigan Department of Public Health recommended that you seek another source of water for drinking and cooking purposes. Inasmuch as the Verona Pumping Station is in the close proximity to your home, the City of Battle Creek would like to offer the opportunity to obtain water for drinking and cooking purposes from the Verona Dumping Station, 250 Brigden Drive. Should you wish to obtain water, the Pumping Station will be open for this purpose between the hours of 8 AM to 10AM and 4 PM to 5 PM Monday thru Sunday. There will be no charge for the water, but it will be necessary for you to bring your own containers.

The City of Battle Creek hopes this will provide you with some measure of assistance until a solution for this problem can be determined and implemented.

Sincerely,

Laverne A. Serne, P.E. Director of Public Works

LAS.'ch



TO: William Iversen

Water Quality Division

Department of Natural Resources

DATE:

January 15, 1982

FROM: Richard M. Wirsing RMW

SUBJECT: Private Well Sampling Results - Battle Creek Area

Please find attached copies of the results of analyses for volatile, halogenated hydrocarbons conducted on water samples collected from privately owned wells in the Battle Creek area. These samples were collected on January 5, 1982. Owners of those wells shown to contain organic chemicals have been contacted by this office and advised of the results. The Calhoun County Health Department is contacting those residents whose wells have been shown to be unaffected.

More sampling of privately owned wells in the residential area south of the Verona Wellfield will be conducted. You will be advised of these sampling results.

RMW:rs Attachments

JAN 19 1982.
Groundwater Ausl., WQD

MEMORANDUM

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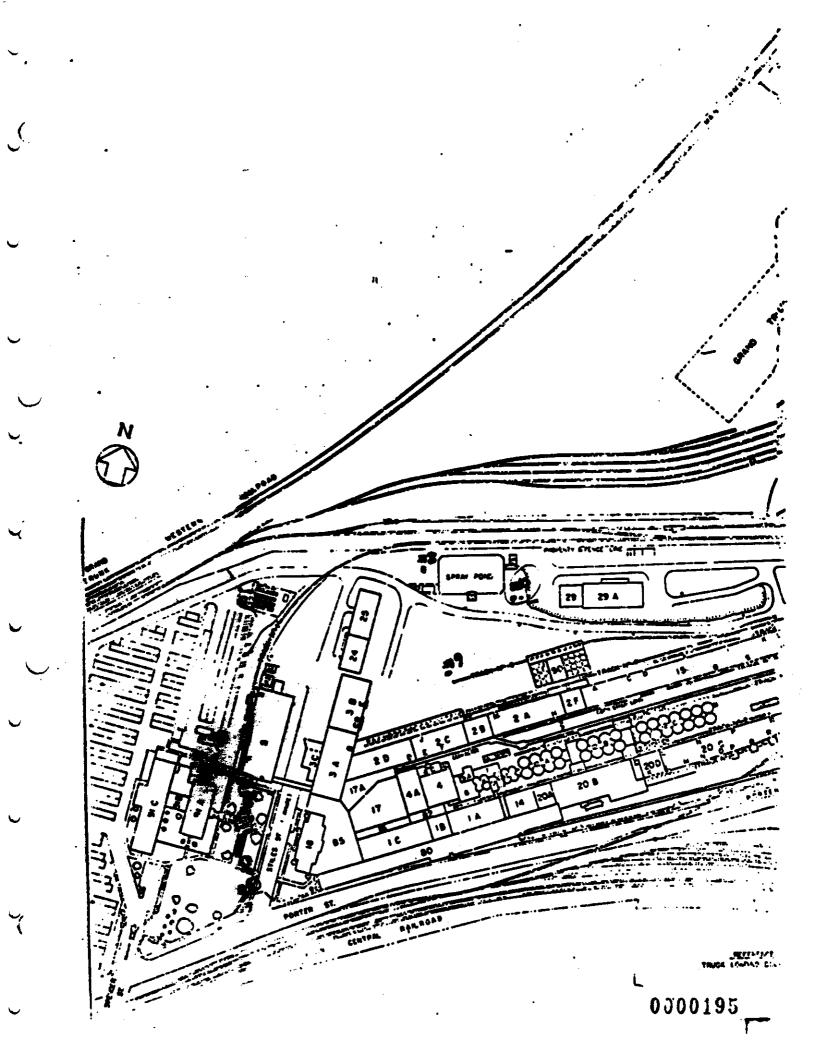
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To: Task Force Members

Through: Gordon E. Olivier, P.E.

FROM: Richard M. Wirsing RAW

DATE:

February 26, 1982

0450

SUBJECT:

Battle Creek Area Groundwater Contamination

Sampling Results

Please find attached copies of the analysis results of sampling conducted by this office on February 18, 1982. Water samples were collected from one city-owned well in the Verona Wellfield, one privately-owned well in the residential area south of the Verona Wellfield, and from 4 wells owned by the Kellogg Company and located at the plant site in Battle Creek. These samples were collected in an effort to identify all contaminants which may be present in the groundwater. [The attached results are from analyses for volatile, halogenated and non-halogenated hydrocarbons.]

The analysis results of the samples from the privatelyowned well and the city-owned well are consistent with previous sampling results from these wells. No volatile, non-halogenated hydrocarbons were detected in these samples.

The analysis results of the samples from the wells owned by the Kellogg Company show the presence of up to 7 volatile, halogenated hydrocarbons. These organic chemicals have previously been found in other wells in the Battle Creek area. No volatile, non-halogenated hydrocarbons were detected. The Michigan Department of Public Health had not previously sampled Kellogg's wells. Sampling conducted by the company had shown trichloroethylene to be present in some of the wells.

On February 10, 1982, a meeting was held at the Kellogg Company facility in Battle Creek. At this meeting, requests for information were made by us and others. Attached are the responses of the Kellogg Company to these requests. The information provided includes all available information regarding the wells and the sample analysis techniques used.

Task Force Members Page 2 February 26, 1982

Additional samples were collected on February 18, 1982 from the privately-owned well, the city-owned well, and one well owned by the Kellogg Company which had been shown to have the highest concentrations of TCE. These additional samples will be analyzed for aliphatic hydrocarbons, aromatic hydrocarbons, mixed ring compounds and non-aromatic compounds, and some inorganic compounds. The results of these analyses will be reported to you as soon as they become available.

RMW:ak Attachments

cc: Task Force Contact Persons:

William Iversen, Water Quality Division, DNR
Albert Hafner, Food & Dairy Division, Dept. of Agriculture

Ray Cummings, U. S. Geological Survey
Steve Ostrodka, U.S. Environmental Protection Agency
Theodore Havens, Calhoun County Health Department

LaVerne Serne, City of Battle Creek Don Thomason, Kellogg Company

cc: William A. Kelley, P.E.
cc: Don Keech/Joe Lovato

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PUBLIC HEALTH

location Code (1-3)

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# KELLOGG COMPANY U.S. FOOD PRODUCTS DIVISION BATTLE CREEK, MI 49016

February 18, 1982

Mr. Richard M. Wirsing Acting District Engineer Michigan Department of Public Health 3500 North Logan P.O. Box 30035 Lansing, MI 48909

Dear Mr. Wirsing:

The attached are our responses to the six items requested at the February 9 Groundwater Contamination Meeting held at the Kellogg Company.

Sincerely,

Don Thomason

General Plant Manager

att.

On February 10, 1982 a meeting was requested by the Kellogg Company with representatives from the city of Battle Creek, the Department of Natural Resources, the Calhoun County Health Department and the Michigan Department of Health to discuss groundwater contamination affecting well water in the Battle Creek area and specifically the finding of the Compound Trichloroethylene (TCE) in four of the company's five wells. The company was requested to provide the following six items:

† 1. All available information regarding their wells (location, construction, well logs, water levels, etc.).

Response: See attachments 1 and 2.

 Information regarding the techniques used to conduct the water analys s.

Response: See attachment 3.

 Make arrangements to allow sampling of their wells without having to pump directly into the plant distribution system (pump to waste).

Response: See attachment 4 - Sampling of wells will be completed February 18, 1982.

4. Identify any possible sources of contamination they might suspect.

Response: No additional information identified for possible source.

- 5. Investigate the possibility of granting permission to the EPA Technical Assistance Team or the EPA Federal Investigation Team to drill monitoring wells on company property.
  - Response: The company is more then willing to cooperate in the investigation; however, additional information from the E.P.A. Technical Assistant Team or the E.P.A. Federal Investigation Team with an overall plan would have to be submitted for review prior to granting permission to drill wells on company property.
- 6. Contact the Michigan Department of Agriculture and inform them of the findings and the actions taken.

Pasponse: Natified on February 10, 1982.

Don Thomason

### APPROXIMATE DEPTHS OF EARTH STRATA

0 - 24 Fill (Cinders)

24 - 48 Sand

48 - 51 Clay

51 - 60 Shale & Sandstone

60 - 111 Grey Sandstone

111 - 119 Shale

### No. 7 WELL

Drilled: Before 1933 Size: 8 inch

Wall 102 ft. Depth:

Casing 78 ft.

Casing

Cold Roll Steel Material:

Capacity: 400 GPM

In pit under ground Location:

floor in 99 bldg. So, end of Jetzone

No. 8 WELL

Drilled: 1933

Size: 16"

Well 122 ft. Depth:

Casing 100 ft. 9 in.

Casing

Material: Cold Roll Steel

Capacity: 1.000 GPM

Location: West of Spray Pond

300' north of No. 2

Bldg. Canopy Dock

No. 9 WELL

Drilled: 1933

Size: 14 inch

-> Depth: Well 112 ft.

Casing 96 ft.

Casing

Material: Cold Roll Steel

Capacity: 500 GPM

Location: North of No. 2 Bldg.

Canopy Dock.

No. 10 WELL

Drilled: 1941 Size: 16 inch

─> Depth: Well 106 ft.

Casing 97 ft. 4 incl

Casing

Material: Cold Roll Steel

Capacity: 1,000 GPM

Location:

South east corner of Spray Pond behim-

No. 2 Bldg.

No. 11 WELL

Drilled: 1945

Size: 16 inch

Depth: Kell 113 ft...

Casing 81 ft.

Casing

Material:

Location:

Cold Roll Steel

Capacity: 600 GPM

Old No. 6 Well Pit

below man hole cover

February 15, 1982

Don Thomason:

Re: Well Water Sampling

### Wells #8 and #10

These wells can be discharged into the Spray Pond while taking samples.

### Wells #7, #9, and #11

Due to the location of these wells in relation to the location of the nearest storm sewer, it will be necessary to pipe the well water some distance when taking samples. Peerless-Midwest, who maintains and tests the capacity of our wells each year, should be hired at the time of sampling to pipe the discharge from each well to the nearest sewer. This procedure is routine.

### Y Procedure

- 1. Sample #8 and #10.
- 2. At the same time set-up #9, #11, and #7.
- 3. Sample #9, #11, and #7.

Ward M. White, Jr.

es

### Don Thomason:

Water Pumped "M" Gals	<u>#7</u>	<u>#8</u>	<u>#9</u>	<u>#10</u>	<u>#11</u>	
September 81	-	27,582	14,431	15,749	17,968	
October		6,952	12,639	17,904	17,661	
November	8,832	7,461	5,911	16,313	7,560	
December	3,264	961	2,138	6,926	2,065	
Innuary 82	-	•	•	-	-	

stattmet hitely. Ward M. White, Jr.

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February 16, 1982

Don Thomason:

SUBJECT: Analyses of Water Sources Used at the Battle Creek Plant for TCE

As follow-up to the February 9 meeting with state officials, the following explains the techniques used to conduct the water analyses:

Water samples from the sources used at the Battle Creek plant were analyzed for TCE. None of the samples were chlorinated except for the city water.

The method used for the analysis was similar to EPA Method 624, (Federal Register Vol. 44, No. 233, December 3, 1979 pg. 69532) with the following modifications.

The volatiles were trapped on a 10.5 cm Tenax tube. This tube was then placed in the heated injector port of the GC/MS. The volatiles were desorbed from the Tenax onto a 25 meter SP-2100 fused silica capillary column maintained at -50°C. After a 10-minute trap time the oven was rapidly heated to 25°C and then programmed to 180°C at 5°C per minute.

Rosalyn Franta

Appendix E
Well Installation

Appendix E

Well Installiation

STS JOB NO	DATE INSTALLED 2-25-7 2  Installed Protector Pipe? 42
385	Stick Up  Concrete (Cross out if not used)  Bentonite Fowder  Nominal Diameter of PVC  2 g alv inches  Pea g vave 1
	Bentonite Pellets (Cross Out if Not Used)  Pea Gravel Concrete Sand On-Site Sand (Circle One)  Double-wrapped Slotted PVC with Mirafi? NO  Length Slotted PVC  5'55  Well 5 crass
2. Did you l Did you f so, w Did the Was the	Material  DN  bentonite pellets hang up?

### FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED

STS JOB NO. 70776 JOB Verme Water Works CLIENT CPA WELL NO. 2 DATE INSTALLED 3-1-72 - Installed Protector Pipe? \_\_\_\_\_\_\_ Stick Up Concrete (Cross out if not used) Bentonite Powder Tip of Well from Ground Surface Nominal Diameter of PVC 2 galv inches Backfill Material 18 Bentonite Pellets Double-wrapped Slotted PVC (Cross Out if Not Used) with Mirafi? <u>h O</u> Pea Gravel Concrete Sand Length Slotted On-Site Sand PVC (Circle One) Material **INSTALLATION** 2. Did you have to drive the protector pipe? \_ Did you install a lock on the projector pipe? \_\_\_\_\_\_\_ If so, who has the keys? Chart Did the PVC come up when you removed the casing? 5. Was the well bailed? 1400 Authors 6. Were water level readings taken after the well was installed?

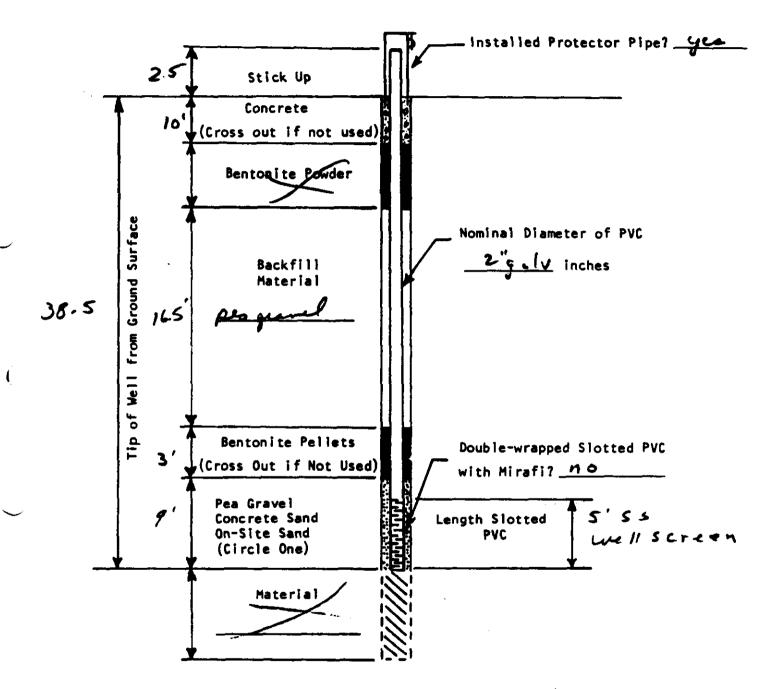
Was a PVC cap installed on bottom of well? 55 we

### FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED

STS JOB NO. 70776 JOB Varma Water Works

CLIENT FPA

WELL NO. 3 DATE INSTALLED 3-3-82



### INSTALLATION

- 1. Did the bentonite pellets hang up? NO
- 2. Did you have to drive the protector pipe? \_n 0

- 5. Was the well bailed? use Saving des Check walve
- 6. Were water level readings taken after the well was installed?
  - . Was a PVC cap installed on bottom of well? SS Lead Screen

STS JOB NO. 70776 JOB Varona Wita Works CLIENT EPA hall No. 4 DATE INSTALLED 2-26-82 \_\_ Installed Protector Pipe? \_\_\_\_\_\_ 25 Stick Up Concrete 10 (Cross out if not used) Bentonite Powder Tip of Well from Ground Surface Nominal Diameter of PVC 2 calv inches Backfill Material 15.5 Bentonite Pellets Double-wrapped Slotted PVC (Cross Out if Not Used) with Mirafi? \_\_\_ 17 0 Pea Gravel Concrete Sand Length Slotted 10' On-Site Sand PVC (Circle One) INSTALLATION Did the bentonite pellets hang up? \_\_\_ Did you have to drive the protector pipe? Did you install a lock on the protector pipe? f so, who has the keys? \_\_\_\_\_\_\_ Did the PVC come up when you removed the casing?  $\frac{n\delta}{n}$ Was the well bailed? USE Spring Gog Chec! Value
Were water level readings taken after the well was installed? 192 5. Was the well bailed? \_\_\_ 1. Was a PVC cap installed on hottom of well? SS well seren

## FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED

				76 JOB Varan Water Works
CLIENT				. 2 7 2
WELL N	10	5	<del></del>	DATE INSTALLED 3-2-72
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•				Bentoni te Powder
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,		from	,	
(		=		
		Tip of Well	_	<u> </u>
		<u>a</u>	ر عر	Bentonite Pellets Double-wrapped Slotted PVC
			2	(Cross Out if Not Used) with Mirafi? NO
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	-			Material III
INSTALL	ATT	3N		
1. Did	the b	en to	ni te	pellets hang up?
2. Did	you h	a ve	to dr	lock on the protector pipe?
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5. Was	the w	<b>~</b> 11	baile	readings taken after the well was installed?
7. Was	a PVC	cap	inst	salled on bottom of well? SS well is well

STS JOB NO. 70776 JOB Varons Water Works CLIENT PA WELL NO. 6 DATE INSTALLED 3-2-82 \_ Installed Protector Pipe? \_\_\_\_\_ 21 Stick Up Concrete (Cross out if not used) Bentonite Powder lip of Well from Ground Surface Nominal Diameter of PVC 2" galu inches Backfill. Material Bentonite Pellets Double-wrapped Slotted PVC (Cross Out if Not Used) with Mirafi? <u>NO</u> Pea Gravel 9' Length Slotted Concrete Sand On-Site Sand PVC (Circle One) INSTALLATION 1. Did the bentonite pellets hang up? NO Did you install a lock on the protector pipe? 42 Was the well bailed? we Spring don charte 1021-Were water level readings taken after the well was installed?

Was a PVC cap installed on bottom of well? St well

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### FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED

STS JOB NO. 70776 JOB Varana Water Works CLIENT EPA WELL NO. 7 DATE INSTALLED 2-22-82 \_ Installed Protector Pipe? ربع Stick Up Concrete (Cross out if not used) Bentonite Powder lip of Well from Ground Surface Nominal Diameter of PVC 2 ac 1 /2 inches Backfill Material 23 peu grave l Bentonite Pellets Double-wrapped Slotted PVC (Cross Out if Not Used) with Mirafi? \_\_^O Pea Gravel 8' Concrete Sand Length Slotted <u>5' 55</u> On-Site Sand PVC Well Screen (Circle One) Materia) **INSTALLATION** Did the bentonite pellets hang up? \_\_\_\_\_\_ Did you have to drive the protector pipe? Did you install a lock on the protector pipe? If so, who has the keys?\_ Did the PVC come up when you removed the casing? MD Spring day check vaile 5. Was the well bailed? \_\_\_\_\_\_\_ 6. Were water level readings taken after the Well was installed? \_\_\_\_\_\_\_\_ 7. Was a PVC cap installed on bottom of well? St well Streen

### FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED

,	STS JOB NO	PA		DATE INSTALLED 2.23-82	
	39'	Tip of Well from Ground Surface	2 7	Stick Up  Concrete (Composite Powder  Pentonite Powder  Nominal Diameter of PVC  2"calv inches  Pen q ravel  Double-wrapped Slotted PVC	
		•	8.	(Crass Out if Not Used)    See Grave    Length Slotted PVC   SS we     Material   Material   Material     Material   Material   Material     Material   Material   Material     Material   Material   Material     Material   Material   Material     Material   Material   Material   Material     Material   Material   Material   Material     Material   Material   Material   Material   Material     Material   Material   Material   Material   Material   Material     Material	Ĭ ∀ - <sup>a</sup> = <b>h</b>
1 2 3 4 5 6 7	<ul> <li>Did you</li> <li>Did you</li> <li>If so, w</li> <li>Did the</li> <li>Was the</li> <li>Were wat</li> </ul>	bento have insta ho ha PVC o well er le	to drail and the come under the come	pellets hang up? 100 0; rive the protector pipe? 0 lock on the protector pipe? 100 0; e keys? up when you removed the casing? 100 0; ed? 100 500; 100 0; readings taken after the well was installed? 100 0; talled on bottom of well? 100 0;  100 0;	000216

FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED STS JOB NO. 70776 JOB Varane Water Works CLIENT EPA DATE INSTALLED 2-24-82 WELL No. 9 🗕 Installed Protector Pipe? <u>\_ ৭০ ০</u> 2.5 Stick Up Concrete (Cross out if not used) Bentenite Powder Tip of Well from Ground Surface Nominal Diameter of PVC 2 galv inches **Backfill** Material Bentonite Pellets Double-wrapped Slotted PVC with Mirafi? \_ ^ O (Cross Out if Not Used) Pea Gravel Concrete Sand Length Slotted 8 On-Site Sand PVC (Circle One) Material INSTALLATION Did the bentonite pellets hang up? \_\_\_ ho 2. Did you have to drive the protector pipe? \_\_\_ A O Did you install a lock on the protector pipe? \_\_\_\_\_\_ If so, who has the keys?\_\_\_\_ 

5. Was the well bailed? \_\_\_\_\_ Specimo voa

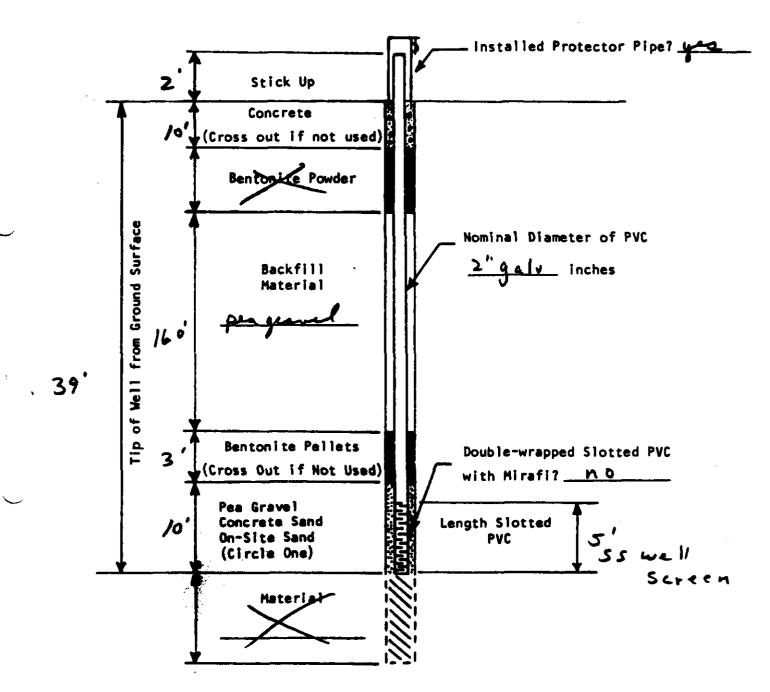
6. Were water level readings taken after the well was installed?

Ualve

# STS JOB NO. 70776 JOB Varan Water Works

CLIENT EPA

WELL NO. 10 DATE INSTALLED 3-8-82



INSTALLATION	0.000000
1. Did the bentonite peliets hang up?	0000218

- 4. Did the PVC come up when you removed the casing? M b
- 5. Was the well bailed? we spring day Check Unive
- 6. Were water level readings taken after the well was installed? 4.7. Was a PVC cap installed on bottom of well? 5.5. 4.4.11 Scheen

STS JOB NO. 70776 JOB Varma Water Works CLIENTEPA DATE INSTALLED 3-15-82 WELL NO. \_\_ \_ Installed Protector Pipe? \_\_\_\_\_\_\_\_ Stick Up Concrete (Cross out if not used) Bentonite Powder Nominal Diameter of PVC 2" we inches Backfill Material Bentonite Pellets Double-wrapped Slotted PVC with Mirafi? 10 (Cross Out if Not Used) Pea Gravel Concrete Sand Length Slotted 10 On-Site Sand PVC (Circle One) Material **INSTALLATION** Did you install a lock on the protector pipe? 422 Did the PVC come up when you removed the casing? \_\_\_\_\_\_\_\_ 5. Was the well bailed? Were water level readings taken after the well was installed? re-7. Was a PVC cap installed on bottom of well? \_ \$ \$ \\_4

STS JOB NO. 70776 JOB Varons Water Works CLIENT SPA DATE INSTALLED 3-15-72 WELL NO. \_/2 \_\_\_ Installed Protector Pipe? \_\_\_\_\_ Stick Up Concrete (Cress out if not used) ፟፟ entopice Powder Tip of Well from Ground Surface Nominal Diameter of PVC 2 gelv. inches Backfill Material Sentonite Pellets Double-wrapped Slotted PVC with Mirafi? 10 (Cress Out if Not Used) Rea Gravel Length Slotted Concrete Sand Ja No-Site Sand PVC (Circle One) INSTALLATION Did you have to drive the protector pipe? Did you install a lock on the protector pipe?\_\_\_\_\_\_ If so, who has the keys? CA Did the PVC come up when you removed the casing? \_ 5. Was the well bailed? we ear Were water level readings taken after the well was installed? Was a PVC cap installed on bottom of well? 55 well

FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED STS JOB NO. 70776 JOB Varona Water Works CLIENT EPA DATE INSTALLED 3-8-82 WELL NO. \_\_\_\_ \_\_\_ Installed Protector Pipe? \_\_\_\_\_ Stick Up Concrete (Cross out if not used) Bentonite Powder lip of Well from Ground Surface Nominal Diameter of PVC 2 4 L/V inches Backfill Material Bentonite Pellets Double-wrapped Slotted PVC (Cross Out if Not Used) with Mirafi? \_\_ 9' Pea Gravel Length Slotted Concrete Sand On-Site Sand PVC (Circle One) Material INSTALLATION 0000221 Did the bentonite pellets hang up? \_ n 6 Did you have to drive the protector pipe? Did you install a lock on the protector pipe? If so, who has the keys? & client Was the well bailed? Lee Sprine dog Check Lalve Were water level readings taken after the well was installed?

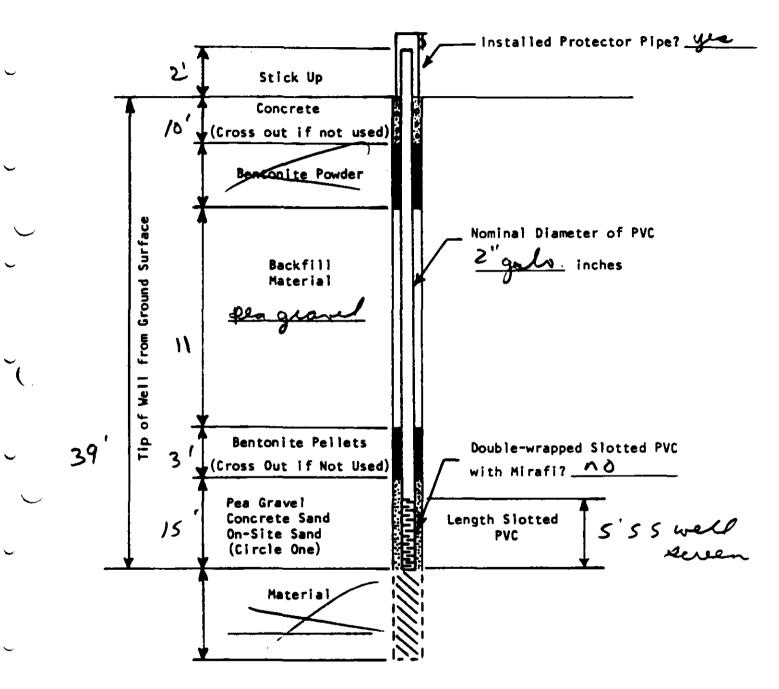
Was a PVC cap installed on bottom of well? Ss well

#### FIELD WELL INSTALLATION DIAGRAM - AS INSTALLED

STS JOB NO. 70776 JOB Unions Water Works

CLIENT CPA

WELL NO. 14 DATE INSTALLED 3-12-82



#### INSTALLATION

- 3. Did you install a lock on the protector pipe? 4
- 4. Did the PVC come up when you removed the casing? NO
- 5. Was the well bailed? use spring for check sale
- 6. Were water level readings taken after the well was installed?
- 7. Was a PVC cap installed on bottom of well? SS well seems

STS JOB NO. 70776 JOB Varence Water Works CLIENT PA DATE INSTALLED \_ WELL NO. \_\_\_ Installed Protector Pipe? \_\_\_\_\_ Stick Up Concrete (Cross out if not used) Bentonite Powder lip of Well from Ground Surface Nominal Diameter of PVC Backfill Material 16 39 Bentonite Pellets Double-wrapped Slotted PVC (Cross Out if Not Used) with Mirafi? <u>N d</u> Pea Gravel Concrete Sand Length Slotted 10 On-Site Sand PVC (Circle One) Material INSTALLATION 2. Did you have to drive the protector pipe? Did you install a lock on the protector pipe?\_\_\_ If so, who has the keys? <u>Clien7</u> Was the well bailed? LAC Spring tion Check Using Were water level readings taken after the well was installed? Was a PVC cap installed on bottom of well? 55 well

STS JOB NO. 70776 JOB Varma Water Worker CLIENT EPA WELL NO. 16 DATE INSTALLED 3-5-82 \_\_\_ Installed Protector Pipe? \_\_\_\_\_ Stick Up Concrete (Cross out if not used) Bentonite Powder Tip of Well from Ground Surface Nominal Diameter of PVC Z'gelo inches Backfill Bentonite Pellets Double-wrapped Slotted PVC (Cross Out if Not Used) with Mirafi? 10 Pea Gravel Length Slotted Concrete Sand On-Site Sand PVC (Circle One) Material

#### **INSTALLATION**

- Did the bentonite pellets hang up? \_\_no
- Did you have to drive the protector pipe? \_\_\_\_\_\_ no
- Did you install a lock on the protector pipe? 480 If so, who has the keys? Chica T
- Was the well bailed? \_\_\_\_\_\_\_ Serve dog Check Usl Were water level readings taken after the well was installed?
- Was a PVC cap installed on bottom of well? 51 well

Appendix F
Industrial Inspections

Appendix F

Industrial Inspections

#### **EPA PROJECT**

#### ECOLOGY AND ENVIRONMENT, INC.

#### MEMORANDUM: REGION V

COST CENTER EP151-5

TO: Ross Powers

FROM: Technical Assistance Team

VIA: Scott McCone

SUBJECT: EDO Assistance Grosse Isle, Michigan

DATE: March 18, 1982

#### COMMENTS:

From February 24, 1982 to March 10, 1982 personnel from TAT assisted Ross Powers from Grosse Isle, Michigan. During this period of time the TAT members delivered equipment to Battle Creek, Michigan, obtained information on East Bay Township groundwater contamination, conducted an on site inspection of U.S. Coast Guard Air Station in Traverse City, Michigan, and conducted SPCC inspections in Battle Creek, Michigan. The following is a chronology of events:

#### Wednesday, February 24, 1982

At 1530, I arrived in Battle Creek, Michigan to supply ice chests and other equipment for Battle Creek, Michigan Groundwater Survey.

At 1730 I secured.

#### Thursday, February 25, 1982

At 1130, I arrived at EDO in Grosse Isle, Michigan. At 1300 I met with Ross Powers who supplied information on East Bay Township groundwater contamination problem in Traverse City, Michigan. At 1630, I arrived in Traverse City, Michigan. An inspection of the U.S. Coast Guard Air Station was scheduled for the following day.

#### Friday, February 26, 1982

At 0800, I arrived at the Grand Traverse County Health Department. Mr. William Stanton of the County Health Department provided information on the potentials source or sources of the contamination.

At 1030, I arrived at U.S. Coast Guard Airbase. CDR Thomas Morgan, the Commanding Officer of the Air Station, was not available; a meeting was scheduled for 1300.

At 1100, I arrived at the Traverse City Engineers Office where I obtained copies of aerial photos along with maps of the affected area. At 1245, I returned to the Air Station and met with Commander Morgan. Commander Morgan supplied maps of the surrounding area. According to Commander Morgan the U.S. Department of Navy had operated the facility in the 1940's. During this period, the Navy, according to maps of the facility, had used a portion of the property as a dump site. Commander Morgan could not confirm this information.

At 1500, Commander Morgan and I surveyed the Airstation. No observation of the alleged dump area was possible due to a heavy snow cover.

At 1700, I secured.

#### Wednesday, March 3, 1982

At 1000, I met Mr. Ross Powers of the EDO in Grosse Isle, Michigan at the MDNR Headquarters in Lansing, Michigan. A meeting was arranged by Mr. Powers to give Federal assistance to the MDNR on their current investigation of the East Bay Township groundwater contamination problem in Traverse City, Michigan. Representatives of MDNR Water Quality Division, Groundwater Quality Division, Environmental Enforcement, and Michigan Department of Public Health were present.

According to MDNR personnel a series of studies and investigations including the location of monitoring wells around the contaminated area indicates that a potential source of contamination came from the property of the U.S. Coast Guard Airstation, located in Traverse City, Michigan. Mr. Powers requested that the MDNR notify U.S. Coast Guard officials of the studies and their results. Ms. Claudia Weaver of MDNR Environmental Enfrocement would request that a letter be sent to U.S. Coast Guard officials.

At 1230, I reviewed MDNR files on East Bay Township Groundwater contamination problem.

At 1530, I arrived at Soil Testing Services office. Soil Testing Service was contracted to install monitoring wells in Battle Creek, Michigan. I received sample bottles and equipment needed to complete the Battle Creek, Michigan Groundwater contamination survey. At 1800, I arrived at the Verona Pumping Station and secured for the day.

#### Tuesday, March 9, 1982

At 1100, I met Mr. Scott McCone, who had arrived from Chicago to assist in SPCC inspections in Battle Creek, Michigan. The information collected will assist Michigan DNR and EPA personnel who are presently investigating ground-water contamination problems in Battle Creek, Michigan. At 1330 Mr. McCone, Mr. Tom DeFouw, and I met with Ross Powers from the EDO in Grosse Isle, Michigan. Mr. Powers requested that TAT members assist him in the inspection of industrial facilities in Battle Creek, Michigan.

During the inspection TAT members were asked to check SPCC Plans and acquire information regarding past spill or discharges of material onto the ground. Mr. Powers also requested that TAT personnel to obtain information from local Fire Departments, concerning discharges of material into ground. At 1700, we secured.

#### Wednesday, March 16, 1982

7

At 0730, Mr. McCone, Mr. DeFouw, and I met with Mr. Powers at the Verona Pumping Station. Mr. Powers and Mr. DeFouw left to gather soil samples from the Grand Trunk Railyard for analysis.

At 0800, Mr. McCone and I arrived at the Penfield Township Fire Department to collect information on past discharges of material. Penfield Township Fire personnel had already provided the information to Mr. Powers.

At 0830, Mr. McCone and I arrived at the Battle Creek Fire Department where we met with Fire Chief Yager. Chief Yager provided information concerning a discharge of oil which had occured in the later 1940's.

At 0900, Mr. McCone and I accompanied Chief Yager to Benke Industries. According to Chief Yager, Benke Industries have in the past discharged materials into the ground and into the Battle Creek River. Chief Yager could not verify what materials were dumped. The area is approximately 2 miles downstream from the area affected in the Battle Creek Groundwater survey.

At 0930, Mr. McCone and I inspected Reith Riley for an SPCC check. No plan was available for inspection. A copy of 40CFR was given to Reith Riley officials.

At 1030, Mr. McCone and I arrived at Kellogg Company. Upon inspection of the Kellogs facility no violations of the SPCC was noted.

At 1400, Mr. McCone and I inspected Packaged Conveience Foods, a Division of General Foods. A survey of the facility indicated that a spill from an aboveground edible oil tank could enter a storm sewer line. The company is presently considering constructing a dike completly around the tank.

At 1600, Mr. McCone and I returned to the Verona Pumping Station. At 1700, we secured.

John Dourjalian

1h Tink

JD:pj

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RALPH W. BENNETT, PLANT MA	WAGER		1616 1966-100	<u> </u>
275 CLIFF STREET, BATTLE (			<u> </u>	
3. TYPES OF OIL STORED AND CAPACITY OF	ABOVEGROUND AND BURIED	STORAGE.	_	
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SEE DETAILED SPCC DOCUMENT	MATION REPORT			
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4. IS A CERTIFIED SPCC PLAN AVAILABLE FO	OR INSPECTIONS TO YES		S, DATE OF INSPE	CTION
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3. NAME AND REGISTRATION NUMBER OF C	ENTIFYING ENGINEER UNG	TAVAILABLE		N WAS OT AVAILABLE
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TANK TRUCK LOADING AREA IS	CURBED.			
EXTERIOR ABOVEGROUND TANK		THE COMPANY IS C	ONSIDERING	
A COMPLETE DIKE AROUND THE				
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	•		001	
3a. SPCC NO.	11b. CASE NO.	Total Mar		00230
14. 3FEE MG.	TDD# 5-8203-2		DES NO. NOT AV	/AILABLE
124. INSPECTOR (sign)		· · ·	125. DATE	
126. INSPECTOR (Print)		<del>_</del>	MARCH 10,	1982
SCOTT W. McCONE				

FPA Form 7500.57 10 001

B. SPCC INSPECTION	SUMMARY SHEET		- <del></del>	
SPCC NO. CASE NO.		DATE OF	HAPLETION	
	R203_2	MARCH	10. 1982	•
NAME OF INSPECTOR (Signalure)	12 <u>01-</u> 2	PATE OF	SOCUMENT	ATION HEPORT
Apriles The Care		MARCH	15. 1982	•
MAME OF INSPECTOR (Print)		NPDES NO		<u> </u>
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SCOTT W. McCONE	CILITY	NONE		
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275 CLIFF STREET	STATE		219	(00t
BARRIE CARRY	MICHIGAN		490	17.6
PACILITY NAME	IMICHIGAN		<u></u>	710
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RENT CORPORATION	<del></del>			
GENERAL FOODS CORPORATION	•	•		
ADDRESS	<del></del>	<del></del> -		<del></del>
250 NORTH STREET				
CITY ZOO NORTH STREET	STATE		ZIP	CODE
WHITE PLAINS	NEW YORK	•	1	.0625
C. WATER BODY PROTECTED				
BATTLE CREEK RIVER				
	RPOSE			· · · · · · · · · · · · · · · · · · ·
INITIATION: TRANSPORTER SAME				
INITIATION: IN Routine Surveillance Coast Guard Information				
Spill Report Citizen Information Other (specify	d:			
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#### C. DETAILLD SPCC DOCUMENTATION

THE INSTRUCTIONS
ON PAGE A

FACILITY

DATE OF INCHICTION

PACKAGED CONVENIENCE FOODS (POST) DIVISION OF GENERAL FOODS
1. FACILITY DESCRIPTION

MARCH\_10, 1982

IL TYPE OF BUSINESS/OPERATION

#### FOOD MANUFACTURER

Ib, FACILITY OIL STORAGE

- 4-50,000 GALLON BURIED TANKS FOR #2 FUEL OIL STORAGE
- 1-20,000 GALLON BURIED TANKS FOR #2 FUEL OIL STORAGE
- 2- 3,000 GALLON BURIED TANKS FOR GASOLINE STORAGE
- 1- 2,000 GALLON BURIED TANK FOR DIESEL OIL STORAGE
- 1-15,000 GALLON BURIED TANK FOR ACETALDENYDE STORAGE
- 2-10,500 GALLON ABOVEGROUND TANKS FOR EDIBLE OIL STORAGE
- 2- 7,000 GALLON ABOVEGROUND TANKS FOR EDIBLE OIL STORAGE
- 11- 55 GALLON DRUMS FOR SHELL SOLVENT AND CARBON TETRACHLORIDE STORAGE

#### IL PREVENTION MEASURES PROVIDED

BURIED TANKS ARE CHECKED WEEKLY FOR LOSSES AND AUTOMATIC LEVEL INDICATORS ARE CHECKED AND LOGGED DAILY.

TANK TURCK LOADING AREA IS CURBED AND DRAINS ARE CLOSED AND LOCKED.

THE TWO 7,000 GALLON EDIBLE OIL TANKS ARE INSIDE THE MAIN BUILDING; ANY SPILLS WOULD ENTER SANITARY SEWER LINE.

THE TWO 10,500 GALLON EDIBLE OIL TANKS ARE PARTIALLY DIKED TO ALLOW DRAINAGE INTO SANITARY SEWER LINE.

Id. APPEARANCE OF PACILITY (housekeeping)

ALL AREAS OF THE FACILITY ARE CLEAN AND NO SPILLS WERE OBSERVED.

10. PAST SPILL HISTORY

NONE

2. RECEIVING WATER (should a spill accur)	
28. NAME AND/OR DISCHIPTION	
BATTLE CREEK RIVER	
, : 	
Perennial Intermittent	
☐ Water present at time of inspection ☐ Inspector traced discharge to receiving water	
Inspector traced apparent drainage path to receiving water  Receiving water identified by company representative	
Receiving water identified from topo maps  Receiving water identified by other means (specify):	
25, PROBABLE FLOW PATH TO RECEIVING WATER	
OIL WOULD FLOW INTO STORM SEWER LINE, AND FLOW NORTH 1,500 YARDS INTO BATTLE CREEK RIVER	THE
·	
2c. CLIMATIC INFORMATION FROM OWNER/OPERATOR	
NONE	
	!
	0000233
	11000233

PAGE 2 OF

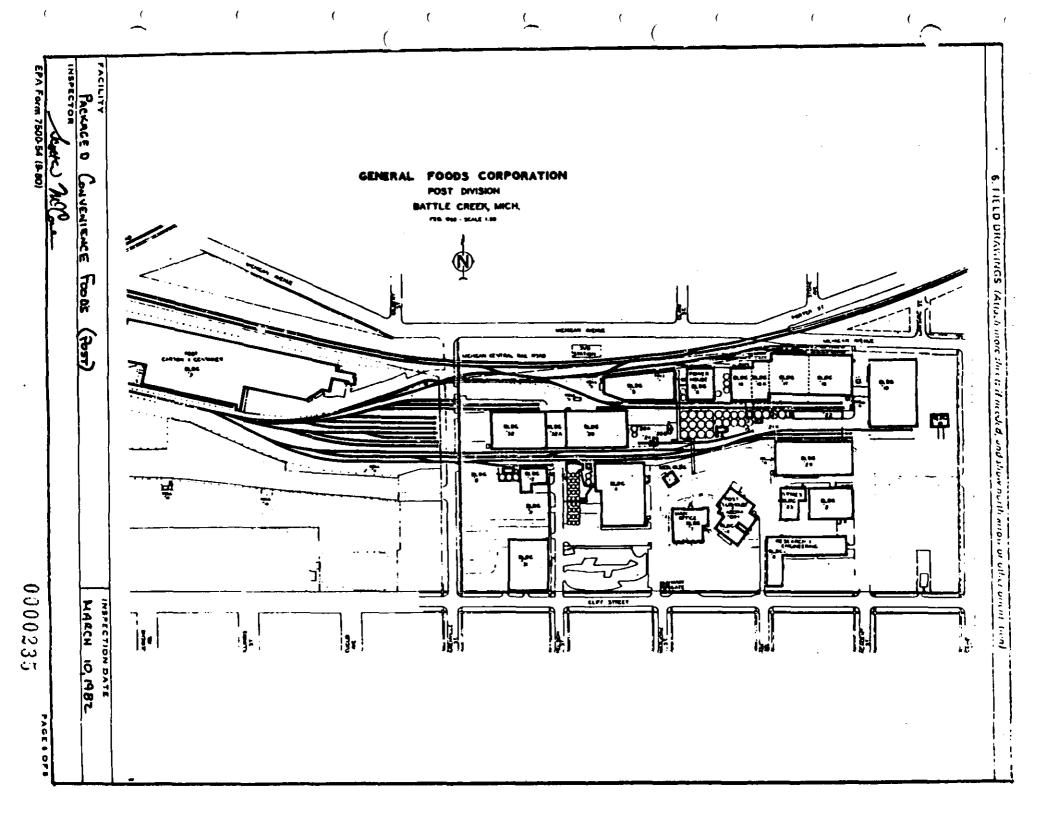
ED& Enim 7500,54 (9,80)

A survey of the post facility indicated that a spill from the aboveground edible oil tank could enter a storm sewer line. The company is presently considering constructing a dike completely around the tanks. All other tanks are situated in such a manner as to not present a spill potential. The 55 gallon drums are scattered throughout the facility; any spill from a drum may enter a storm sewer or sanitary sewer line.

The four buried #2 Fuel Oil Tanks were tested in 1980 at the request of the Michigan DNR.

0000234

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	CORRECTION FILLD SHEET		10.510.06.510.005
l,	Regulation is applicable to Facility - see 40		ON HIVINSE
18 HAME OF FACILITY	•	i ii	A OF FACILITY
RIETH RILEY CONSTRUCTION COL	MPANY, INCORPORATED	J ASP	PHALT_PAVING CO.
IC. FACILITY LOCATION			
1175 N. Raymond Road, Battle	Creek, Michigan 49017		
		Airs Cu	
Robert J. Pfauth, Divisian 1	Manager	(616	1962-5168
14. MAILING ADDRESS			
P.O. BOX 56, Battle Credk, 1	Michigan 49016	•	
3. TYPES OF OIL STORED AND CAPACITY O	F ABOVEGROUND AND BURIED STOR	AGE.	
· See detail SPCC Documentation	on Form		
·			
	•		
4. IS A CERTIFIED SPCC PLAN AVAILABLE	TOR INSPECTIONS TES THO	, S, DATI	OF INSPECTION
• •		' MARC	H 10. 1982
NAME AND REGISTRATION NUMBERGE	CERTIFYING ENGINEER KINOT AVA		SPCC PLAN WAS
Γ		] """	Maga yayı cyarız
	•		
B. IS SPCC PLAN FULLY IMPLEMENTER (A)	the liams called for in the Plan in the inte	met of mill arguettos esta-	The India Red - Makes makel).
HOT APPLICABLE			
NO PLAN AVAILABLE			
1			
S. NAME OF WATER BODY THAT POTENTIA	L SPILL COULD ENTER OR IF UNNAM	ED TRIBUTARY, THEN FI	RET NAMED WATERSORY
DOWNSTREAM (if known)			
0			
Grand Trunk Ditch 100 yards	southwest of the facility.		
1. COMMENTS (include comments by sang)	·		
T. COMMERTS (Include comments by:Maner/e	sperator - write on bock or attach extra shee	m (f messa)	ļ
40		d. All makem she	
An earthen dike was present			
tanks are not diked. Gera			
there is only a slight goss	idility of any material end	etrik a sotrace .	elei.
		•	
		••	
[			0000236
)			
11a. SPCC NO.	11b. CASE NO.	IIC. NPDES NO.	MOT AVAILABLE
	TDD# 5-8203-2		
124. INSPECTOR (sign)	•	120.07	
Little) MY		<u>Ma</u>	rch 10, 1982
124 INSPECTOR (print)			
1			

EPA Form 7500-53 (9-80)

B. SPCC INSPECTION	
SPEC NO. CASE NO. TDD# 5-820	3-2 MARCH 10, 1982
NAME OF INSTECTOR ISIENSILIES	MARCH 15, 1982
AME OF INSPECTOR (Print)	NPDES NO.
Scott McCone	. NONE
8. COMPANY	
RIETH RILEY CONSTRUCTION COMPANY, INCORPO	TELEPHONE
1175 N. RAYMOND ROAD	(616) 962-5168
BATTLE CREEK	MICHIGAN 49017
SAME AS ABOVE	·
B. FACILITY LOCATION	
PARENT CORPORATION	
NONE	
10AE38	
CITY	STATE
E. WATER BODY PROTECTED	
GRAND TRUNK DITCH, A TRIBUTARY TO THE BAT	
2. PU INITIATION: X Routine Surveillance Coast Guard Information	RPOSE
Spill Report Citizen Information Other Ispecia	
Plan Preparation Plan Implementation Plan Amendment	1
3. INS	TITLE
ROBERT J. PFAUTH	DIVISION MANAGER
INDIVIDUAL CONTACTED	TITLE
NOTIFICATION	
4. FINDINGS	S. ATTACHMENTS (None required if facility in apparent compliance)
SOURCE IN APPARENT COMPLIANCE WITH SPEC REQUIREMENTS	
□Yes	MONE ATTACHED ALREADY ON FILE
☐ Have adequate plan ☐ Not subject to regulations	*Detailed Observations
Insufficient storage  No reasonable spill expectation	Slides 🖸 🗆
Plan fully implemented  New facility operational less than 6 months	*Photographs Image: Comments of the Conversations of the Conversation of the Conversat
	*Comments
∭ No ☑ No plan	Telephone Conversations 🖫 📋 📋
Plan not properly certified  Plan does not have management approval	"(ALL REQUIRED IF FACILITY IS NOT IN APPARENT COM-
Plan not maintained at facility manned 8 hrs/day inadequate plan (detailed SPCC Plan review attached)	PLIANCE. If photos not permitted, check "None" and explain. Add "SPCC Plan" to List of Attachments when appropriate.)
Plan not fully implemented  Plan not reviewed within 3 years	1
Other	
	0000237

# C. DETAILED SPCC DOCUMENTATION FACILITY DATE OF INSPICTION MARCH\_10, 1982 RIETH BILEY CONSTRUCTION COMPANY, INCORPORATED 1. FACILITY DESCRIPTION IS TYPE OF BUSINESS/OPENATION ASPHALT PAVING COMPANY 2 - 10,000 CALLON BURIED TANKS FOR CASOLINE STORAGE 1 - 1,000 GALLON ABOVEGROUND TANK FOR #2 FUEL OIL STORAGE 4 - 10,000 GALLON ABOVEGROUND TANK FOR ASPHALT STORAGE 1,000 GALLON BURIED TANK FOR #2 FUEL OIL STORAGE 1 - 1,000 GALLON BURIED TANK FOR #2 FUEL OIL STORAGE 5,000 GALLON BURIED TANK FOR WASTE OIL STORAGE 1 - 10,000 GALLON ABOVEGROUND TANK FOR MCO 30 STORAGE 1 - 10,000 GALLON ABOVEGROUND TANK FOR SS+H STORAGE 500 GALLON BURIED TANK FOR WASTE OIL STORAGE 1 - 10,000 GALLON ABOVEGROUND TANK FOR #2 FUEL OIL STORAGE 55 GALLON DRUMS FOR MISCELLANEOUS OIL STORAGE 30 ~ It. PREVENTION MEASURES PROVIDED An earthen dike was present aroune the #2 Fuel Oil Tank. All other aboveground tanks are no diked. In case of a spill, sand is used to contain the oil. Earth around the asphalt tanks is removed yearly. IL APPEARANCE OF FACILITY (housekeeping)

Asphalt was present around Boiler Room and Asphalt Tanks. All other areas clean.

16. PAST SPILL HISTORY

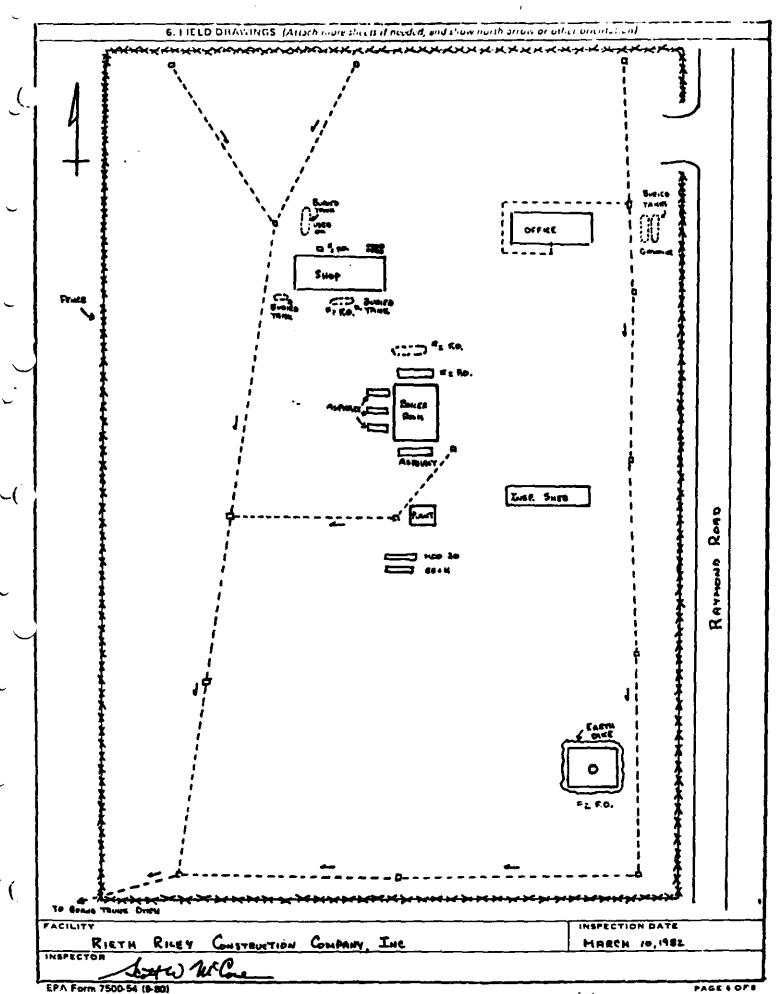
NONE

0000233

_ ,	2. RUCLIVING WATTR fileld a politic corp
	78 HAME AND/OH DESCHIPTION
	BATTLE CREEK RIVER
	•
`	
İ	
1	
~	
΄ Ι	☑Perennial ☐ Intermittent
$\mathcal{A}$	Water present at time of inspection
-	Inspector traced discharge to receiving water  Inspector traced apparent drainage path to receiving water
Ì	Receiving water identified by company representative
	Receiving water identified from topo maps  Receiving water identified by other means (specify):
ا .	25. PROBABLE PLOW PATH TO RECEIVING WATER
	Oil would flow into a storm sewer catch basin, flow 100 yards wouthwest into
	the Grand Trunk Ditch, and then into the Battle Creek River 1,000 yards west.
	·
_	
,	
	2c. CLIMATIC INFORMATION FROM OWNER/OPERATOR
	NONE
(	
•	
	0000239
	EPA Form 7500-54 (9-80) PAGE 2 OF 6

A survey of the Rieth Riley Construction Company, Inc., indicated that any spill from the aboveground #2 Fuel Oil Tank just north of the Boiler Room or in the Drum Storage Area by the shop would flow into the storm sewer line. Inside the shop are two solvent drums used for parts cleaning; these drums are returned to the distributor for recycling. The Rieth Riley Facility was relocated by the Grand Trunk Railroad a few years back to its present location. No spills have occured at the present location.

The vertical aboveground tank in the southeast corner of the facility is not being utilized at this time. None of the buried tanks have been tested for leaks.



1 To be completed	I CONSIDERION INCLUSIBLET ( 181 - Regulation to explicable to facility and 4001 R.fe.,	112.1.1 112.1 112.
KELLOG_COMPANY		FOOD MANUFACTURERS
235 PORTER STREET BAT	TLE CREEK, MICHIGAN 49016	
DONALD W. THOMASON, GE	_	16. TELLIMONE NUMBER  1616 ) 966-2000
22, MAILING ADDRESS  235 PORTER STREET, BAT	TLE CREEK, MICHIGAN 49016	
S. TYPES OF OIL STORED AND CAPA	CITY OF ADOVEGROUND AND SURIED STORAGE.	
SEE DETAILED SPCC DOCU	MENTATION FORM	
·		
4, IS A GERTIFIED SPCC PLAN AVAIL	LABLE FOR INSPECTIONS TYES HO	B, DATE OF INSPECTION
6. NAME AND REGISTRATION NUMBER	ER OF CERTIFYING ENGINEER   NOT AVAILABLE	MARCH 10, 1982
1	8.0	CERTIFIED   HOT AVAILABLE
· II COUOMM/WZCUZCAN A	L 00710	NOVEMBER 9, 1979
L.W. SCHOTT/MICHIGAN #	EDI (Are the tiems called for in the Flan in the interest of sp.	
HOT APPLICABLE		
ALL CONTAINMENT DEVICE	S AND TESTS CALLED FOR IN THE PLAN A	PRESENT.
1 MAME OF WATER BOOK THAT PO	TENTIAL SPILL COULD ENTER: OR IF UNNAMED TRIB	UTARY, THEN PIRST NAMED WATERBOOK
DOWNSTREAM (If known)		
BATTLE CREEK-RIVER	,	
·	owner/operator - write on back or utuch extra sheets if need	•
	IND THE #6 FUEL OIL TANK, AND THE DRAI	
TANK CARS ARE CLOSED A	AND LOCKED. ALL BURIED TANKS ARE INSP	ECTED ANNUALLY.
	_	
	•	•
IIa. SPCC NO.	11b. CASE NO.	132, NPDES NO. NOT AVAILABLE
120. INSPECTOR (sign)	TDD# 5-8203-2	12b. DATE
13E INSPECTOR (print)		
SCOTT W. McCONE		
* *		0.200

1	B. SPCC INSPECTION SUMMARY SHEET				
	SPCC NO. TDD# 5-8203-	2	MARCH	10, 1982	
,	NAME OF INSPECTOR (Signature)		MARCH	15, 1982	ATION REPORT
٦	SCOTT W. MCCONE	•	NONE	<b>,</b> — — —	
	1, FAC	ILITY			
Ì	ECOMPANY  KELLOG COMPANY				
ŀ	ADDRESS	· · · · · · · · · · · · · · · · · · ·		PELEPHONE	
~	235 PORTER STREET	STATE	K	616) 966-	2000 CODE
	BATTLE CREEK	MICHIGAN		49	016
- {	SAME AS ABOVE				
ı	B. FACILITY LOCATION				
`	PARENT CORPORATION			<del></del>	
	NONE	<del></del>		<u></u> -	
	<del>-</del> ·				
	GITY	STATE	<u> </u>	ZIP	CODE
_	C. WATER BODY PROTECTED				<del></del>
1	BATTLE CREEK RIVER	LACE .			<u> </u>
1	INITIATION: Manual Surveillance: Coast Guard Information	PUSE			
إر	Spill Report Citizen Information Other Imacify	<b>/:</b>			
٦ ا	YPE:  ☐ Plan Preparation ☐ Plan Implementation ☐ Follow-up ☐ Plan Amendment				
	3. INSPE	CTION	TITLE		
	DONALD W. THOMASON			L PLANT	MANAGER
	INDIVIDUAL CONTACTED		TITLE		
~	NOTIFICATION		L		
,	4. FINDINGS	S. ATTACHMENTS (	None maure	d if facility in	apparent compliance)
	SOURCE IN APPARENT COMPLIANCE WITH SPCC REQUIREMENTS				
			MOME	ATTACHED	ALREADY ON FILE
	Have adequate plan	*Detailed Observations		<b>E</b>	
	☐ Not subject to regulations ☐ Insufficient storage	*Photographs Slides			סכ
	No reasonable spill expectation	Map	178	Δ.	000000
ı	☐ Plan fully implemented ☐ New facility operational less than 6 months	*Field Drawing		<b>E</b>	ō
-		*Comments		ΣΩ.	
	□ No □ No plan	Telephone Conversation *SPCC Plan	ns (2)3.   (2)		H 1
	Plan not properly certified				
	Plan does not have management approval Plan not maintained at facility manned 8 hrs/day	*(ALL REQUIRED II PLIANCE, II photos n			
	Inadequate plan (detailed SPCC Plan review attached)	"SPCC Plan" to List of			
(	Plan not fully implemented Plan not reviewed within 3 years				
	☐ Other				İ
	<del>_</del> ,				ì
		<u> </u>			

#### C. DETAILED SPCC DOCUMENTATION

1. FACILITY DESCRIPTION

SEE POSTING HORS ORPAGES

DATE OF INSHICTION

KELLOGG COMPANY

MARCH 10, 1982

IL TYPE OF BUSINESS/OPERATION

FOOD MANUFACTURERS

Ib, FACILITY OIL STORAGE

- 4 23,7000 GALLON ABOVEGROUND TANK CARS FOR #6 FUEL OIL STORAGE
- 1 63,000 GALLON ABOVEGROUND TANK FOR #6 FUEL OIL STORAGE
- 1 63,000 GALLON BURIED TANK FOR #6 FUEL OIL STORAGE
- 1 12,000 GALLON BURIED TANK FOR GASOLINE STORAGE
- 1 6,000 GALLON BURIED TANK FOR DIESEL OIL STORAGE
- 2 10,000 GALLON ABOVEGROUND TANKS FOR EDIBLE OIL STORAGE
- 1 9,950 GALLON BURIED TANK FOR CRC CLEANING SOLVENT STORAGE
- 1 1,450 GALLON BURIED TANK FOR RECLAIMED SOLVENT STORAGE
- 210 55 GALLON DRUMS FOR MISCELLANEOUS OIL STROAGE

THE ABOVEGROUND TANKS FOR #6 FUEL OIL STORAGE ARE KIKED:

THE ABOVE EDIBLE OIL STORAGE TANKS ARE LOCATED INSIDE THE MAIN BUILDING AND ANY SPILL WOULD ENTER A SANITARY SEWER LINE.

THE RAILROAD TANK CAR AND TANK TRUCK LOADING AREAS ARE CURBED AND DRAINS LEADING FROM THE AREAS ARE CLOSED AND LOCKED.

ALL BURIED TANKS ARE EMPTIED YEARLY AND INSPECTED: ALL BURIED TANKS ARE CHECKED DAILY FOR LOSSES.

Id. APPEARANCE OF PACILITY (housekeeping)

GENERAL AREAS OF THE FACILITY ARE CLEAN. DRUM STORAGE AREA SHOWS MINOR SPILLS.

14. PAST SPILL HISTORY

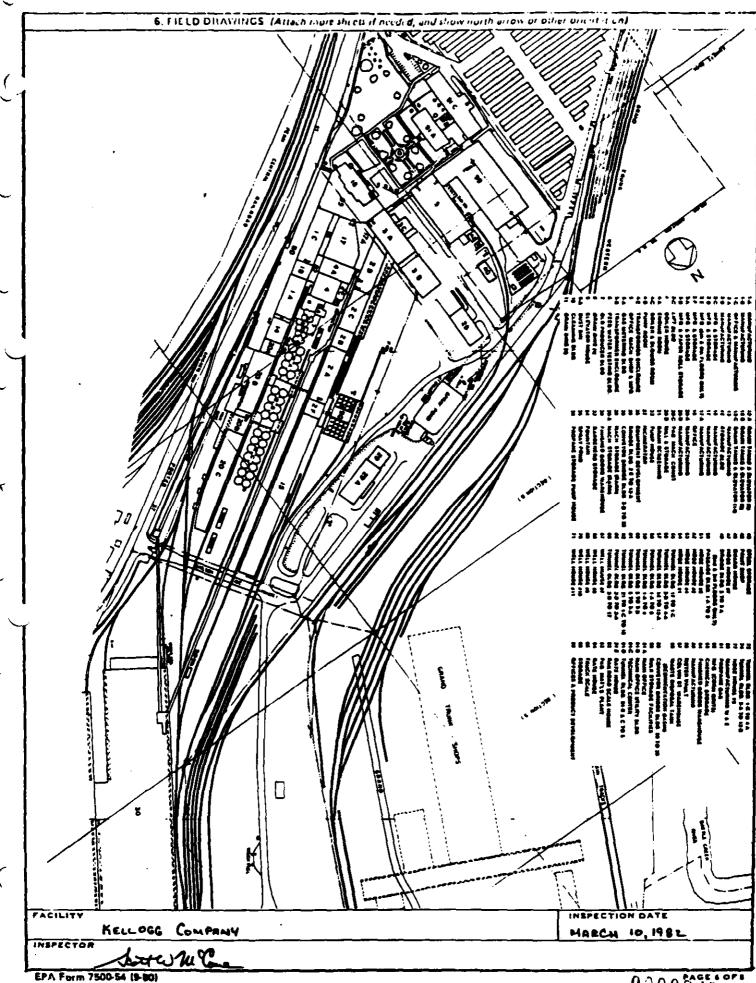
NONE

EPA Form 7500-54 (8-63)

	2. BECLIVING VATER Inheritation of the cury
	Za. HAME AND/ON DISCHIPTION
(	BATTLE CREEK RIVER
Ĭ	
<u>_</u>	
	☐ Perennial ☐ Intermittent     ☐ Water present at time of inspection
	Inspector traced discharge to receiving water
	Inspector traced apparent drainage path to receiving water  Receiving water identified by company representative
	Receiving water identified from topo maps
~	Receiving water identified by other means (specify):
(	1b. PROBABLE FLOW PATH TO RECEIVING WATER
	OIL WOULD FLOW INTO A 60" STORM SEWER LINE, AND FLOW NORTH 1500 YARDS INTO THE
~	BATTLE CREEK RIVER.
,	
<u> </u>	
	26. CLIMATIC INFORMATION FROM OWNER/OPERATOR
_	TO BEIMATIC INFORMATION FROM OWNER/OFERMION
	NONE
-	
,	
ţ	·

A survey of the Kellog Company indicated that any spill from an aboveground tank would be contained by a dike or would enter a sanitary sewer line. An leak from a buried tank would be noted during routine level checks. Any spill in the tank truck or tank car loading areas would be contained by the closed drains. Any spill from a 55 gallon trum would be contained in the drum storage area.

A review of the SPCC Plan disclosed that a number of transformers and capacitors were listed since they contained PCB. These have been replaced but the plan has not been updated.



المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع		
A. SPCC INSPECTION FIELD SHEET ( To be completed if SPCC Regulation is applicable to Facility - see 4DCFR Part 112.1.)		SEE INSTRUCTIONS ON REVENSE
18 NAME OF PACILITY	IB.TYPE OF FACIL	.IT Y
Thomas Solvent Company	Bulk-Chemica	1 Packaging
	Arts Code	
	1616 ) 963-55	65
		- <u>-</u>
Aromatic and aliphatic solvents		
	<b>~</b>	
Hill of the tanks except one empty vertical tank are underground	<b>u</b> .	
•		
•		
4. IS A CERTIFIED SPCC PLAN AVAILABLE FOR INSPECTIONS THE THE	S. DATE OF INSPEC	TION
	February 8,	1982
E. NAME AND REGISTRATION NUMBER OF CERTIFYING ENGINEER WHOT AVAILABLE	7. DATE SPCC PLAN	WAS
_		D: ~~~!!
	ĺ	
	j	
	ion actually installed -	if observable?; .
<del>-</del>		
Buckets to contain connection spillage		1
•		
DOWNSTREAM (if known)	INENTINE! NAMEL	WATER-000
City storm drain system to Rattle Creek River		
		i
18 COMMENES (Include comments by oppositant the property of heat of attack of the sheets if needed)		· <del></del>
		_
The owner stated that his Environmental Engineer, Ron Byersmith,	was preparin	9
a michigan Pir Plan, which may quality as a Sput Plan.		
·		
l ,		
I	DES NO.   NOT AV	AILABLE
5~8201-1		AILABLE
	120 DATE	
124 INSPECTOR (sign) 5-8201-1		
5-8201-1	120 DATE	
	To be completed if SPCC Regulation is applicable to Facility - see 40CFR Part 112.1.1  18 NAME OF CALLITY  Thomas Solvent Company  11. Facility Location  1180 Raymond Raod - Battle Creek, Michigan 49016  22. NAME OF OWNER AND/OR OFERATOR RESPONSIBILE FOR FACILITY  Richard Thomas, Owner  22. MAILING ADDRESS  P.O. Box 44, Battle, Creek, Michigan 49016  3. TYPES OF OIL STORED AND CAPACITY OF ABOVEGROUND AND BURIED STORAGE.  Aromatic and aliphatic solvents  Industrial Chemicals  The owner did not itemize his tanks or give capacities for the All of the tanks except one empty vertical tank are underground  4. IS A CERTIFIED SPCC PLAN AVAILABLE FOR INSPECTIONS WES WOOD AVAILABLE  B. IS SPCC PLAN FULLY IMPLEMENTED (Any the Herms called for in the Plan in the interest of spull provent what applicable  Buckets to contain connection spillage  5. IS SPCC PLAN FULLY IMPLEMENTED (Any the Herms called for in the Plan in the interest of spull provent what applicable and the provent applicable of the plan in the interest of spull provent applicable.  Chamber of water Body that Potential Spill Could Enter: OR If Unhamed Tributary.  DOWNEY REAM (If howm)  City storm drain system to Battle Creek River	Thomas Solvent Company  1180 Raymond Raod - Battle Creek, Michigan 49016  22 Mame of Owner And/Or Operation responsibility Richard Thomas, Owner  1180 Raymond Raod - Battle Creek, Michigan 49016  23 Mame of Owner And/Or Operation responsibility Richard Thomas, Owner  24 Mame of Owner And/Or Operation responsibility Richard Thomas, Owner  25 Mame of Owner And/Or Operation responsibility Richard Thomas, Owner  26 Malling Address  27 P.O. Box 44, Battle, Creek, Michigan 49016  28 Thomas The Owner And I I I I I I I I I I I I I I I I I I I

<b>.</b>	SUMMARY SHIET	EXTENT OF SECTION	· · · · · · · · · · · · · · · · · · ·	
5-8201		February 8, 1982		
NAME OF INSTITUTOR IS ENDING!		February 8, 1982		
NAMEOF INSPECTOR (FINE)		NPDES NO.		
Jerome Kelly				
P COMPANY	CILITY			
Thomas Solvent Company				
1180 Raymond Road	(616) 963-5565		963-5565	
Battle Creek	Michigan		49016	
Same as above		·	<u> </u>	
b. FACILITY LOCATION		<del></del>		
Same as above		·		
Same as above			·	
ADDRESS		··	<del></del>	
CITY	STATE		ZIF CODE	
C. WATER BODY PROTECTED			<u> </u>	
	•		•	
2. PUF	RPOSE			
INITIATION: Routine Surveillance Coast Guard Information Spill Report Citizen Information Other Ispecify	·1:			
TYPE: X Plan Preparation Plan Implementation	~ _   _			
Follow-up Plan Amendment 3. INSP	CTION			
INDIVIDUAL CONTACTED TITLE				
Richard Thomas			President	
	-			
NOTIFICATION				
4. FINDINGS	5. ATTACHMENTS (A	one required if facil	ity in apparent compliance)	
OURCE IN APPARENT COMPLIANCE WITH SPCE REQUIREMENTS				
□Yes		NONE ATTAC	HED ALREADY ON FILE	
Have adequate plan	*Detailed Observations		On A Shee	
■ Not subject to regulations ■ Insufficient storage	*Photographs Slides		][	
No reasonable spill expectation	Map		H	
Plan fully implemented  New facility operational less than 6 months	*Field Drawing	<b>X C</b>	n A Sheet⊡	
1 6	*Comments			
Mo No plan	Telephone Conversation *SPCC Plan		7.	
Plan not properly certified	, <u>- 45 / 1<del>5 .</del></u>	ل ب	ب	
Plan does not have management approval Plan not maintained at facility manned 8 hrs/day			OT IN APPARENT COM-	
inadequate plan (detailed SPCC Plan review attached)	"SPCC Plan" to List of		"None" and explain. Add ppropriate.)	
Plan not fully implemented	`			
Plan not reviewed within 3 years	1		•	
Other	1	•		
1	1			

## Sullivan, Hamilton, Ryan & SMRZEEVED ATTORNEYS AT LAW

200 GREAT LAKES FEDERAL SAVINGS & LOA + BLOG

JAMES M BULLIVAN BATTLE CREEK, MICHIGAN 49017 ROBERT P. HAMILTON

 $i_{i}(t_{i}(t))$ Z 1982 RONALD M RYAN

818 3CGS 4584

ENVIRONMENTAL ENFORCEMENT DIVISION

March 1, 1982

Mr. Jack D. Bails, Chief Environmental Enforcement Division Department of Natural Resources Stevens T. Mason Building Box 30028 Lansing, Michigan 48909

Dear Mr. Bails:

DAVID & BYAN

BERT W. SCHULZ

RE: Thomas Solvent Company

We represent Thomas Solvent Company of this City. This letter is written in response to your letter of January 26, 1982, in accordance with understandings reached at our meeting in Lansing on January 23, 1982.

Enclosed herewith is a Polution Incident Prevention Plan prepared and submitted on behalf of Thomas Solvent Company. We trust that this plan will meet with the approval of the Department. We will proceed with the implementation of the plan as stated upon receipt of notification of approval of the plan. If changes are required, please let us know.

With respect to further exploration concerning contamination in the dock area at the railroad spur facility leased by the Company from the Canadian National Railroad, we are proceeding as follows: We have conferred with Keck Consulting Service with regard to that item. Our present plan is to do some soil sampling and testing in the area recently tested by the DNR for comparison purposes. We also intend to sample some adjacent areas to determine, if possible, the extent and, to some degree, the source of soil contamination.

Because of the fact that the EPA plans very shortly to do rather extensive hydrogeological testing in this general vicinity, we would prefer to defer any such testing on our part. It would be a waste of money and energy to duplicate their efforts. Accordingly, we will be most interested in any information you can give us with regard to their plans and progress and, of course, results. We feel this information would be essential for the design of future testing by us.

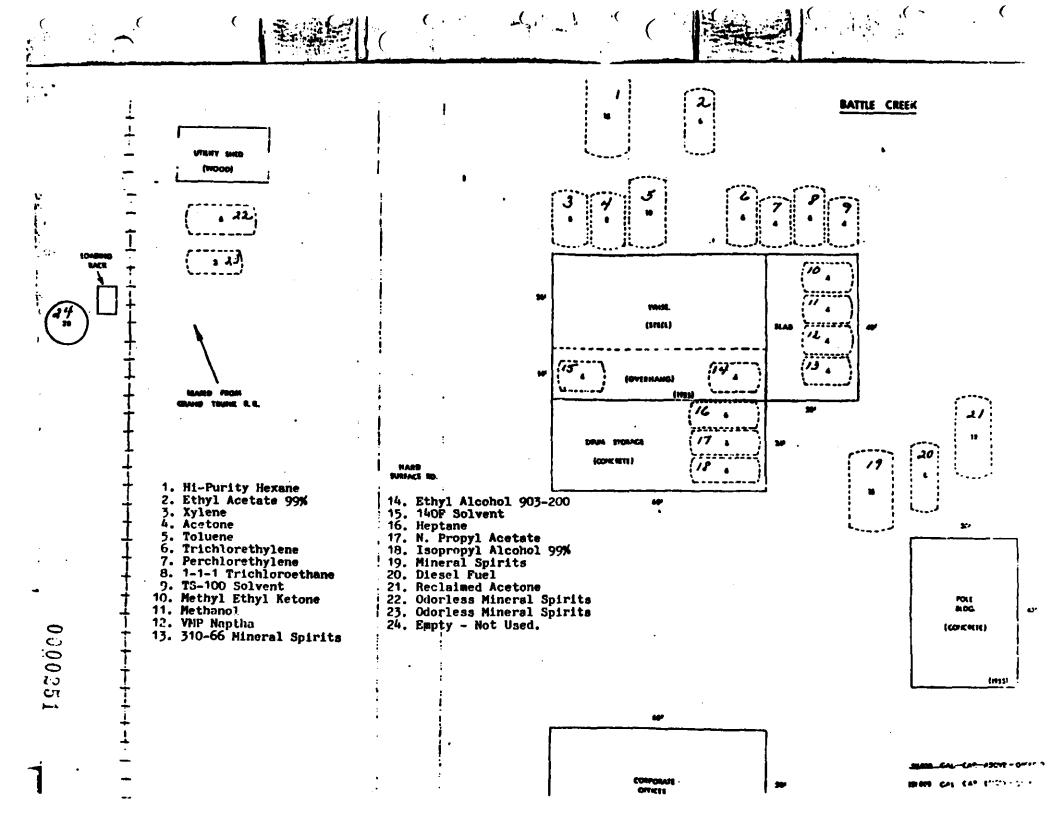
ery truly yours,

James M. Sullivan

JMS/sje Enclosure

With The

Iranica





BATTLE CREEK, MICH. 49016 P.O. BOX 44, (616) 963-5565

MUSKEGON, MICH. 49443 P.O. BOX 51, (616) 777-2619 ROMULUS, MICH. (DET.) 48174 P.O. BOX 422, (313) 484-1580 FORT WAYNE, IND. 46825 5805 PLANEVIEW DR., (219) 482 9638

## THOMAS SOLVENT COMPANY SUPPLEMENT PRICE SCHEDULE

Aromatic Solvents		<u>T/W</u>	T/L Drums
Toluene Xylene TS-100 TS-150	Gal. Gal. Gal.	1.68 1.68 1.88 1.90	1.86 1.86 2.01 2.03
Aliphatic Solvents			
Hexane, Hi-Purity Hexane Heptane Kerosene (Industrial) Lacquer Dilutent-LD Naptha Mineral Seal Oil Mineral Spirits Mineral Spirits 66 Mineral Spirits Odorless Mineral Spirits LEP 140F Solvent Odorless 450-LOPS Petroleum Ether	Gal. Gal. Gal. Gal. Gal. Gal. Gal. Gal.	1.89 1.75 1.67 1.55 1.65 1.55 1.45 1.50 2.17 1.71	2.10 1.93 1.90 1.65 1.88 1.75 1.68 1.73 2.35 1.91 1.90 1.85
Rubber Solvent Textile Spirits VM&P 66 VM&P Hi Flash 80°F VM&P 260 H & F Naphtha 205°F	Gal. Gal. Gal. Gal. Gal.	1.85 1.83 1.76 1.93 1.93	2.03 2.01 1.94 1.94 2.13 1.73

All \$20.00 Drum Deposit

#### L/T/L Drum Schedule

10 - 39 add 10¢

3 - 9 add 22#

1 - 2 add 44¢

Above prices do NOT include Superfund Tax Liability. This tax will be billed as a separate line item on products subject to the tax.

April, 1981 0000252



BATTLE CREEK, MICH. 49016 P.O. BOX 44, (616) 963-5565 MUSKEGON, MICH. 49443 P.O. BOX 51, (615) 777-2619 ROMULUS, MICH. (DET.) 48174 P.O. BOX 422, (313) 484-1580 FORT WAYNE, IND. 46825 5605 PLANEVIEW DR., (219) 482-9638

0,20

## THOMAS SOLVENT COMPANY SUPPLEMENT PRICE SCHEDULE

Alcohols		<u>T/T</u>	T/L Drums
Butyl Alcohol N. Isobutyl Alcohol Isopropyl Alcohol 99% Isopropyl Alcohol 91% Methanol Propyl Alcohol N. Ethyl Alcohol Reg. 590-190 Ethyl Alcohol Reg. 903-190 Ethyl Alcohol Anhy. 590-200 Ethyl Alcohol Anhy. 903-200 Duplicating Fluid-WM-52-200	Gal.	.35 .30 2.05 1.86 .95 .42 1.855 1.83 1.975 1.95	.43 .38 2.60 2.40 1.48 .49 2.37 2.49 2.47 2.42
<u>Esters</u>			
Ethyl Acetate 85% Ethyl Acetate 99% Isopropyl Acetate N. Propyl Acetate Isobutyl Acetate N. Butyl Acetate EE Acetate	Lb. Lb. Lb. Lb. Lb.	.39 .395 .405 .465 .415 .415	.46 .47 .48 .54 .49 .49
Ketones			
Acetone Methyl Ethyl Ketone Methyl Isobutyl Ketone Disobutyl Ketone Diacetone Alcohol AF Cyclohexanone Methyl Isoamyl Ketone Di Methyl Formamide DMF Isophorone	Lb. Lb. Lb. Lb. Lb. Lb. Lb. Lb. Lb.	.27 .42 .47 .52 .50 .61 .48 .59	.34 .49 .54 .59 .57 .68 .55 .67

Drums included in above prices.

Gal.	L/T/L Drum Schedule	<u>Ib.</u>
10 - 39 add 10¢ 3 - 9 add 22¢ 1 - 2 add 45¢		10 - 39 add 2¢ 3 - 9 add 4¢ 1 - 2 add 8¢

Above prices do NOT include Superfund Tax Liability. This tax will be billed as a separate line item on products subject to the tax.

April. 1981



BATTLE CREEK, MICH. 49016 P.O. 90X 44, (616) 963-5585

MUSKEGON, MICH. 49443 P.O. BOX 51, (616) 777-2619 ROMULUS, MICH. (DET.) 48174 P.O. BOX 422, (313) 484-1580 FORT WAYNE, IND. 46825 5805 PLANEVIEW DR., (219) 482-9638

## THOMAS SOLVENT COMPANY SUPPLEMENT PRICE SCHEDULE

<u>Glycols</u>		T/T T	/L Drums
Ethylene Glycol Diethylene Glycol Propylene Glycol, Ind. ** Propylene Glycol, USP ** Dipropylene Glycol ** Hexylene Glycol ** Triethylene Glycol	Lb. Lb. Lb. Lb. Lb.	.37 (.40-3∉ TVA) .315 .44 .47 .44 .60	.44 .39 .51 .54 .51 .68
Glycol Ethers			
Poly-Solv EM Poly-Solv EE Poly-Solv EB Poly-Solv DM Poly-Solv DE Poly-Solv DB	Lb. Lb. Lb. Lb. Lb.	.49 .48 (.52-4¢ TVA) .48 (.52-4¢ TVA) .51 .53 .54	.56 .57 .55 .58 .60
Chlorinated Solvents			
Carbon Tetrachloride Ethylene Dichloride Methylene Chloride Perchlorethylene Trichlorethylene 1-1-1 Trichloroethane Propylene Dichloride	Lb. Lb. Lb. Lb. Lb.	.3050 .24 .28 .32	.25 .35 .3550 .29 .33

\*Prices on Request \*\*1¢/Lb. Higher Factory Packed Drums. Drums included in above prices.

#### L/T/L Drum Schedule

10 - 39 add 2g

3 - 9 add 4¢ 1 - 2 add 8¢

Above prices do  $\underline{\text{NOT}}$  include Superfund Tax Liability. This tax will be billed as a separate line item on products subject to the tax.

April, 1981

SOLVENTS CHEMICALS
SOLVENT REPROCESSING
LIQUID WASTE DISPOSAL

BATTLE CREEK, MICH. 49016 P.O. BOX 44, (616) 963-5565 MUSKEGON, MICH. 49443 P.O. BOX 51, (616) 777-2619 ROMULUS, MICH. (DET.) 48174 P.O. BOX 422, (313) 484-1580 FORT WAYNE, IND. 46825 5605 PLANEVIEW DR., (219) 482-9638

#### THOMAS SOLVENT COMPANY SUPPLEMENT PRICE SCHEDULE

Amines		<u>T/T</u>	T/L Drums
Diethanolamine (DEA)** Monoethanolamine (MEA)** Triethanolamine 85% (TEA)** Triethanolamine 99% (TEA)** Morpholine** N. Methyl Morpholine** Diglycolamine **	Lb. Lb. Lb. Lb. Lb.	.515 (.555-4g .505 (.545-4g .525 (.565-4g .525 (.585-6g 1.02	TVA) .575
Surfactants			
Surfonic N-40 ** Surfonic N-60 ** Surfonic N-95 ** Surfonic N-120 ** Surfonic LF-7 ** Surfonic LF-17 ** Surfonic J-4 **	Lb. Lb. Lb. Lb. Lb.	.55 .55 .5275 .5275 .715 .715	.62 .5975 .5975 .785 .785 .635
Caustic Soda			
Flake Beads Ground Liquid 50%	Lb. Lb. Lb.	#	.2550 .2550

\*Prices on Request.
\*\*1¢/Lb. Higher Factory Packed Drums.
Drums included in above prices.

#### L/T/L Drum Schedule

10 - 39 add 2¢

3 - 9 add 4¢ 1 - 2 add 8¢

Above prices do NOT include Superfund Tax Liability. This tax will be billed as a separate line item on products subject to the tax.

April, 1981

SOLVENTS CHEMICALS
SOLVENT REPROCESSING
LIQUID WASTE DISPOSAL

BATTLE CREEK, MICH. 49018 P.O. BOX 44, (616) 963-5565 MUSKEGON, MICH. 49443 P.O. BOX 51, (616) 777-2619 ROMULUS, MICH. (DET.) 48174 P.O. 90X 422, (313) 484-1580 FORT WAYNE, IND. 46825 5805 PLANEVIEW DR., (219) 482-9638

## THOMAS SOLVENT COMPANY SUPPLEMENT PRICE SCHEDULE

Plasticizers		<u>T/T</u>	T/L Drums
Dioctyl Phthalate (DOP) Dibutyl Phthalate (DBP) Di-Iso-Decyl Phthalate (DIDP) Di-2 Ethyhexyl Adipate (DOA)		.50 .56 .515 .70	.57 .63 .585 .77
Other Chemicals			
Formaldehyde 37% 7-8% Methanol 12-15% Methanol Ni-Par S-20 Ni-Par S-30 N. Methyl 2 Pyrrolidone Styrene Monomer Tetrahydrofuran (THF) Ethylene Carbonate Propylene Carbonate Nonylphenol Epoxy Curing Agents Industrial Coolants	Lb. Lb. Lb. Lb. Lb. Lb. Lb. Lb.	.395 .395 1.18 .44 .8850	.1775 .1875 .465 .465 1.29 .52 1.02 .83
Cold Cleaning Solvents			
Electric Cleaner CS-100 Cold Cleaner No. 49 Cold Cleaner CS-50 Cold Cleaner	Gal. Gal. Gal.		4.23 3.10 2.80 4.25

\*Prices on Request.

Drums included in above prices.

Gal.	<u>L/T/L Drum Schedule</u>		Lb.	-
10 - 39 add 3 - 9 add 1 - 2 add	15¢ 40¢ 75¢	3	- 9	add 2¢ add 4¢ add 8¢

Above prices do NOT include Superfund Tax Liability. This tax will be billed as a separate line item on products subject to the tax.

**BATTLE CREEK, MICH. 49016** P.O. BOX 44, (615) 963-5565

MUSKEGON, MICH. 49443 P.O. BOX 51, (616) 777-2619 ROMULUS, MICH. (DET.) 48174 P.O. BOX 422, (313) 484-1580

FORT WAYNE, IND. 46825 5605 PLANEVIEW DR., (219) 482 9638

#### THOMAS SOLVENT COMPANY SUPPLEMENT PRICE SCHEDULE

Thinners, Mask Wash Solvents	<u>T/T</u>	T/L Drums
Roller Wash TS-65	Gal.	2.40
Type Wash	Gal.	2.50
Lacquer Thinner D-1010	Gal.	2.96
Lacquer Thinner D-1024	Gal.	2.92
Lacquer Thinner D-1030	Gal.	2.74
#8 Mask Wash	Gel.	1.90
Rerun Thinner	Gal.	1.40
Rerun Acetone	Gal.	1.50
Reclaimed Chlorinated	Gal.	2.35
178 Thinner	Gal.	3.06
D-990 Thinner	Gal.	3.04
Silk Screen Thinner	Gal.	2.90
Acrylic Lacquer Thinner	Gal.	3.40
Stripper	Gal.	7.00
Specialty Ink Solvent Blends	*	,,,,,

<sup>\*</sup>Prices on Request.

Drums included in above prices.

#### L/T/L Drum Schedule

10 - 39 add 10¢

3 - 9 add 25¢ 1 - 2 add 48¢

Above prices do <u>NOT</u> include Superfund Tax Liability. This tax will be billed as a separate line item on products subject to the tax.

Appendix G

Future U.S.G.S. Groundwater Model



### United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
6520 Mercantile Way, Suite 5
Lansing, Michigan 48910-7994

March 4, 1982

Mr. Larry A. Osborn
Public Utilities Engineer
City of Battle Creek
Room 101; City Hall
Battle Creek, Michigan 49014

Dear Larry:

Attached is a draft of the proposed ground-water modeling project for the Battle Creek area. It is based on what we know at this time about the distribution of contaminats in the system. We have given an end date of September 30, although decision making information will be available well in advance of that date.

Within the next month or so a letter type bill for \$32,000.00 will be sent to you (or whomever you wish) by Dennis Adams, Chief of the Office of Budget & Federal Aid, Michigan Department of Natural Resources. Your check should be sent to him, made payable to the State of Michigan, as soon as possible thereafter as our cooperative funds are about exhausted. We will include this project in the next cooperative agreement we sign with the State.

Any questions let me know.

Sincerely yours,

T. Ray Cummings District Chief

TRC/p

## Project Proposal for Ground-Water Model of Battle Creek, Michigan

#### GENERAL INFORMATION

Battle Creek is in Calhoun County in the southwestern part of Michigan. It lies on the Kalamazoo and Battle Creek Rivers and has a population of 36,000. Altitude of the land surface ranges from 800 to 950 feet. Average annual precipitation is 34 inches. The area is underlain by the Marshall Formation of Mississippian age and glacial deposits. A study of the water resources of the area was done by Vanlier (1966).

The public water supply of the City of Battle Creek is from wells tapping sandstone in the Marshall Formation. The well field, called the Verona field, consists of about 30 wells located on each side of Battle Creek River on the northeast edge of the city. The wells are 110 to 150 feet deep and have yields ranging from 300 to 1,000 gal/min. In 1981, a total of 1,000 to 12,000 gal/min were pumped from several wells near the center of the field to supply the municipal water system. Under natural conditions, ground water flows from the vicinity of the Verona well field to Battle Creek River. Under a continuous pumping stress averaging 6,000 gal/min, however, Vanlier (1966) found that a cone of depression 2 to 4 feet deep develops in the vicinity of the pumping wells, and that ground water is drawn to the wells from the river.

In 1981, Cis-1,2 dichloroethylene in concentrations as great as 3,900 µg/l was found in water from a domestic well just south of the Verona field.

Other substances--1,1 and 1,2 dichloroethane, 1,1,1 trichloroethane, 1,1 and 1,2 dichloroethylene, trichloroethylene, perchloroethylene, 1,2 dichloropropane, methyl chloride, and vinyl chloride--have also been detected. Water from several wells in the southern part of the field contain some of these contaminants.

In an attempt to contain the contaminants, the city converted two supply wells to purge wells and began pumping water to waste at the rate of 2,000 gal/min. Recently, contaminants have been found in industrial ground-water supplys—at the Kellogg Company and at General Foods.

The State of Michigan and the U.S. Environmental Protection Agency are currently engaged in efforts to determine the source or sources of the organic contaminants. Wells are being drilled, and samples of water and soil analyzed.

#### PROBLEM

Movement of ground water in the Battle Creek area is not understood in sufficient detail to permit accurate predictions of contaminant movement, nor to develop and evaluate remedial plans. It is not certain that present purge pumping serves the intended purpose; acceleration of contaminants to the well field may be occurring. Further, it is impossible to determine which water supply wells should currently be operated, and operated in the future, to prevent more extensive contamination of the Verona field. Alternative purging schemes near sources of contamination cannot be developed and evaluated.

#### **OBJECTIVE**

- (1) To develop a mathematical model of ground-water hydraulics of the Verona well field and surrouding area.
- (2) To determine the effect that current water supply pumping has on the direction and rate of natural ground-water flow, and how changes in the quantity and location of pumping effect flow.
- (3) To determine the most appropriate pumping pattern to assure minimum impact of existing contamination in the well field.
- (4) To evaluate hydrologically suitable locations for installing purge wells if needed.

#### APPROACH

- (1) The project will require six months, beginning April 1, 1982 and ending September 30, 1982.
- (2) Data in files of the city, state agencies, and the U.S. Geological Survey will be assembled and evaluated. This includes, but is not limited to, the following:
  - (a) Water-level data
  - (b) Pumpage data from supply wells in the Verona field, including information on past changes in pumping patterns.
  - (c) Pumping tests conducted in the Verona field.
  - (d) Information on pumpage of wells outside the project area.
  - (e) Information on the altitude of the shale surface underlying the aquifer.
  - (f) Information on characteristics of glacial deposits.
  - (g) Information on the occurrence of organic contaminants to aid in documenting the direction of ground-water flow.
- (3) Develop and calibrate a flow model of the Verona field and surrounding area. The model will encompass a 6 by 6-mile area; a 2-dimensional format will be used. A preliminary model will be developed using existing data. Results from this model will guide subsequent data collection.
- (4) Drill approximately 20 2-inch diameter wells at selected locations to obtain lithologic and water level data. Most of these wells will be necessary in areas where no water quality data needs to be collected, or to provide more detailed information on the well field.
- (5) To support model development, measure water-levels periodically in existing domestic, city, and industrial wells. Water levels will also be measured in wells drilled by the U.S. Environmental Protection Agency, the State of Michigan, and the Geological Survey.

(6) Periodically measure discharge of the Battle Creek River upstream and downstream from the project area.

#### REPORT PLANS

Results of the investigation will be issued in an open-file interpretative report, although preliminary information will be made available on a continuing basis to the City of Battle Creek. Development and calibration of the model, and madel simulations under varying conditions of pumping, will be discussed. Maps and cross sections resulting from different model simulations will be included. The report will also contain tables listing and summarizing data.

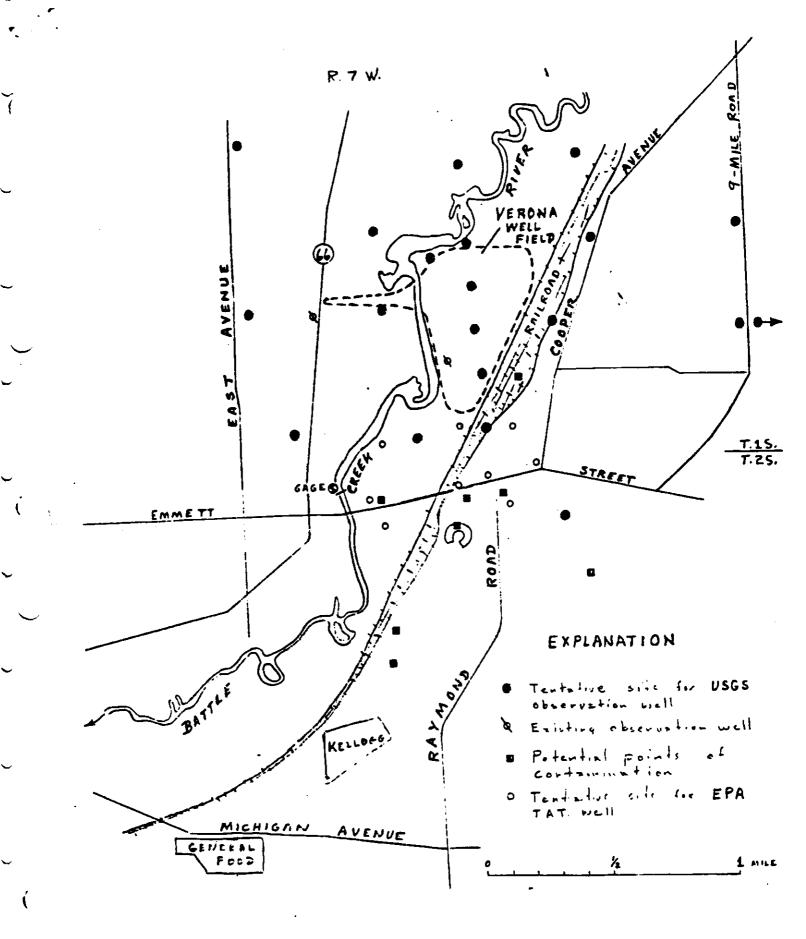
### FUNDING

The following costs are based on a six-month project.

		1982 FY
(1)	Inventory of wells and test holes	2,000
(2)	Drilling about 20 2-inch wells for geologic	
	and hydrologic information	9,000
(3)	Supervision of well drilling and contract	
	preparation	2,000
(4)	Establishment and maintenance of observation	,
	well network; measurement of water levels	9,000
(5)	Discharge measurements on Battle Creek River	2,000
(6)	Equipment and supplies	1,000
(7)	Compilation of data on ground water & geology	3,000
(8)	Analysis and interpretation of data	15,000
(9)	Development of computer-based digital model	16,000
(10)	Preparation of report	5,000
	Total	\$64,000
	Cooperator Share	32,000

#### REFERENCES

VanLier, K. E., 1966, Ground-water resources of the Battle Creek area, Michigan: Michigan Geological Survey Water Investigation 4, 52 p., 19 figs., 2 refs.



Appendix I
Emergency Action Plan

#### EMERGENCY ACTION PLAN

CITY OF BATTLE CREEK Verona Station

T1S R7W, Sec. 32, E1

Pennfield Twp. Calhoun Co., Mich.

prepared by:
Water Quality Division
Mich. Dept. of Natural Resources
November 1981

#### . I Site Summary

In September 1981 the Michigan Department of Public Health detected chlorinated hydrocarbons in residential tap water in Battle Creek. The hydrocarbons were traced to Verona Station, the municipal well field. Contaminants found in municipal wells included:

- 'l. Trichloroethane up to 99 ppb.
- 2. cis-1,2 dichloroethylene up to 79 ppb.
- '3. Trichloroethylene (TCE) up to 34 ppb.
- '4. Perchloroethylene up to 44 ppb.
- \*5. 1,1 Dichloroethane up to 12 ppm. 12.000 fc 6
- 6. 1,2 Dichloroethane 3 ppb.
  - 7. 1,1 Dichloroethylene 5 ppb.

Also, at least ten private and non-community supply wells up gradient from Verons Station are contaminated. Cis-1,2 dichloroethylene as high as 3,900 ppb has been found in one private well. Complete laboratory data is attached.

The City of Battle Creek has one well field with thirty wells. Ten of these wells are known to be contaminated. These ten wells are no longer in service because of the contamination. The well field is located in the Et of Section 32, TlS, R7W, Pennfield Township, Calhoun County, Michigan. The population served by this field is about 40,000. The water needs of the community are being met.

There are, at this time, three suspected sources of the contamination:

- 1. Thomas Solvents (active).
- 2. Raymond Road Landfill (active).
- 3. Settling ponds owned by Grand Trunk Railroad (inactive for about 10 years).

The attached well logs show that the area is mostly sand and gravel. Clay layers are present but do not seem to be continuous. Depending on topography, bedrock (Marshall Sandstone) is encountered between 40 and 100 feet below the land surface. The static water level is 5 to 100 feet below the land surface, depending on topography. The groundwater flow direction is northwest. All the municipal wells in the Verona field are completed in highly fractured Marshall Sandstone.

#### II Site Status

#### A. Security Measures:

- 1. Fencing The Verona Well Field is fenced.
- Access control Access to the well field is through
   a gate.
- 3. Security guards None.
- 4. Other None.

#### B. Ongoing Activities:

- Emergency actions Two of the municipal wells are being continuously pumped at 2.8 MGD to the Battle Creek River in an effort to retard the expansion of the contaminated plume. A total of ten wells have been taken out of service.
- Survey studies Private wells up gradient have been tested by the Health Department. Municipal wells are being monitored weekly.
- 3. Construction None.
- C. Current Information on the Extent of Contamination:
  - 1. Air None available.
  - 2. Soil None available.
  - 3. Groundwater (Verona Well Field) Trichloroethane: 99 ppb; cis 1,2-dichloroethylene: 79 ppb; TCE: 34 ppb; Perchloroethylene: 44 ppb; 1,1 dichloroethane: 12 ppb; 1,2 dichloroethane: 3 ppb; and 1,1 dichloroethylene: 5 ppb. Private wells immediately upgradient of the Verona Field show groundwater contamination in much higher concentrations.
  - 4. Surface water Groundwater from two municipal wells pumped to Battle Creek River via storm sewer.
- B. Current Information on Human Health and/or Environmental Impacts:
  - 1. Using U.S. EPA guidelines, it is calculated that the cancer risk associated with these levels of contamination found in the groundwater at Verona Station is 3.1 extra cancer deaths per year per 100,000 population.
  - 2. Ten of thirty municipal wells are contaminated.

3. At least three non-municipal supply wells and several private wells are contaminated.

#### III Recommended Actions

#### A. Security:

Additional security is not needed at this time.

#### B. Extent of Contamination:

A hydrogeological study to determine the source and extent of contamination is needed. Full determination of the extent of contamination will require hydrogeologic investigation of the bedrock deposits. It is requested that the TAT be mobilized immediately to perform a preliminary investigation of the glacial drift. Also, it is requested that the FIT be enlisted to perform a more exhaustive study based upon the information generated by TAT. Appropriate laboratory analysis of groundwater will be required in both the TAT and FIT investigations.

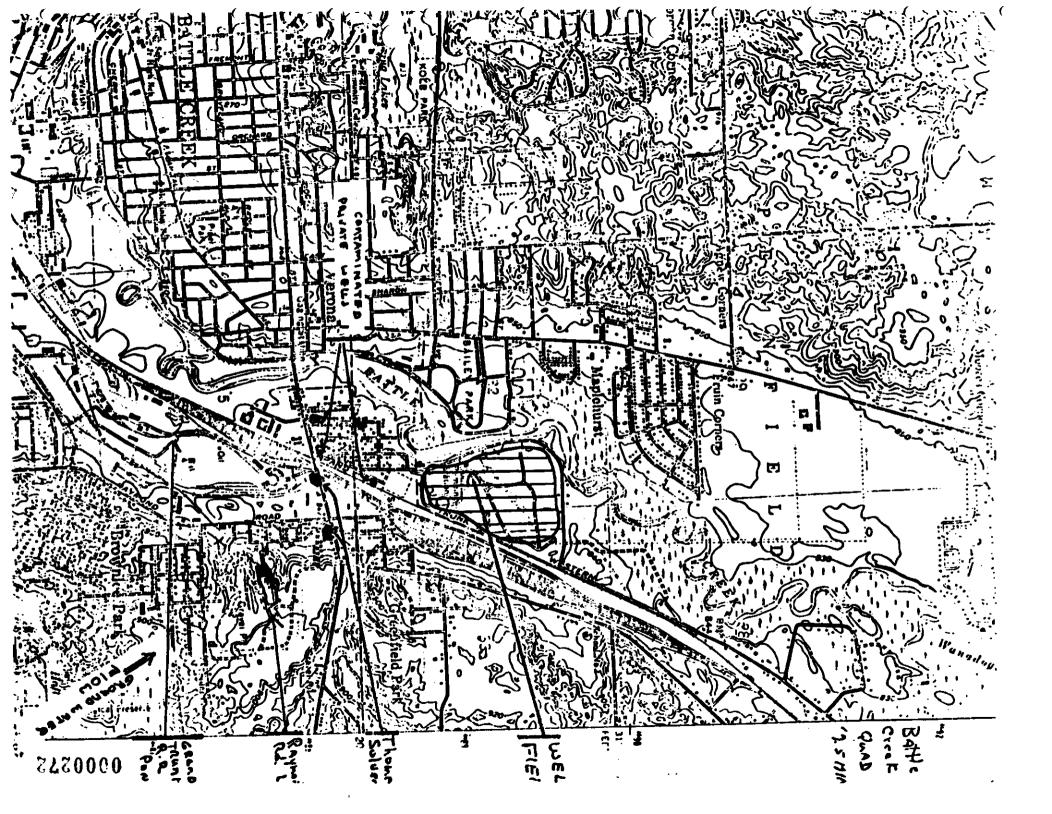
#### C. Mitigative Techniques:

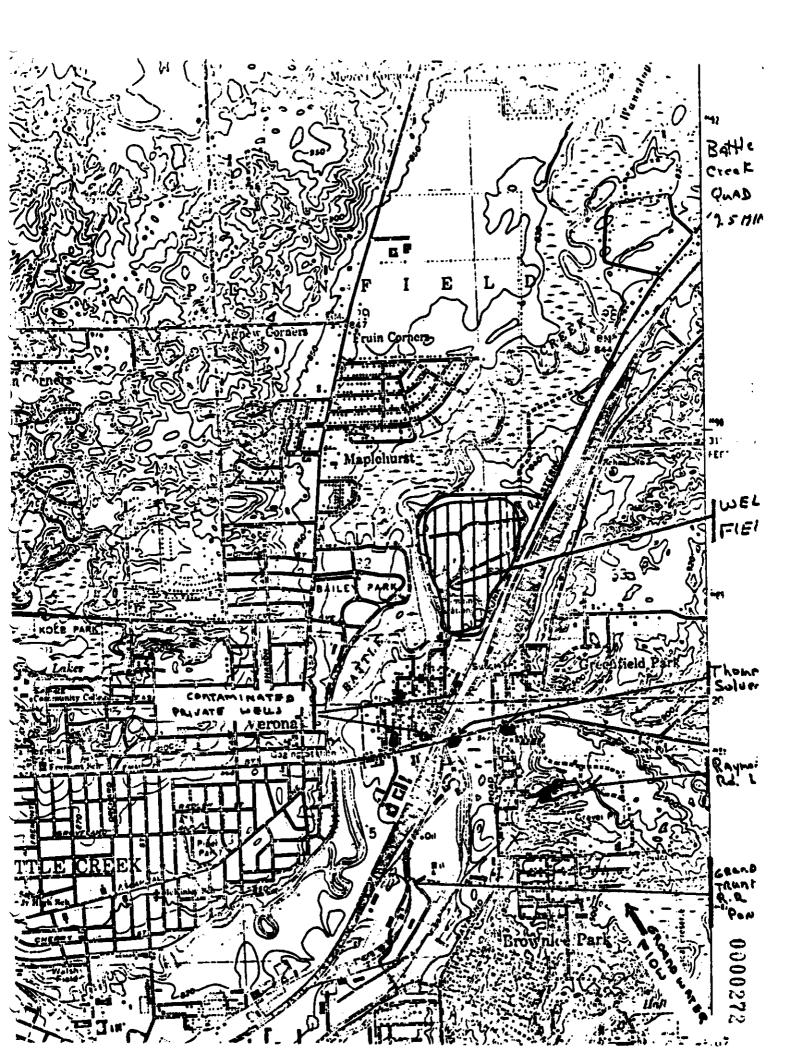
Based upon the results of the hydrogeological study of the area, an evaluation of the measures necessary to mitigate the health and environmental impacts should be prepared. Recommended mitigative measures should be detailed. Computer modeling may be helpful in generating recommendations presented in an evaluation of available options.

#### IV Emergency Action Plan

Task	Management and Administration	Time	Estimated Cost
Hydrogeological Stud	y EPA/State		
A) TAT		60 days	\$35,000
B) FIT		120 days	\$70,000
Options Evaluation	EPA/State	60 days	\$40,000

GA: amk





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Sand & Gravel	25	25	8 SCREEN:	JA Die.:
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year hours	100	123	9 STATIC WATER LEVEL
			_9/_ ft. below land surface
- Sund Man	20	111	10 PUMPING LEVEL below land surface
Saria prono	75	110	ft, after hrs. pureing g.p.m.
			ft. after hrs. pumping 8.9.m.
Marchaell.	10	180	11 WATER QUALITY IN Parts Per Million:
manay	10	70 -	tron (Fe) Chlorides (CI)
~ <u> </u>			HardnessOther
1			12 WELL HEAD COMPLETION: In Approved Pit
			13 Well Grouted? Yes No
			Neat Coment Bentonite
			Depth: From ft. 10 ft.
	<del> </del>	<u> </u>	14 Nearest Source of possible contamination
		1	Well disinfected upon completion Dies (M6)
			15 PUMP: NOU PRACTICAL
		<del> </del>	Manufacturer's Name Str. Manufacturer's Name
-			Model Number 9794 HP #2401ts 130 Length of Orap Pips LOST. capacity LOS.P.M.
			Type: Deubmersible
		<b></b>	Jet   Reciprocating
USE A 200 EMEET IF NEEDED			[
16 Remarks. elevations source of the Religion Hu		1	WELL CONTRACTOR'S CERTIFICATION:
* Forton by			I was drilled under my jurisdiction and this report is true
S E STORY BY		A EGI	STERED BULLIPESS HAME
S. F. Atlan Opt.		Loster	318-94 Kd-Bottle Bras
	•		Bille Bintalle
D67d 100M (Rev. 12-68)		] Signed (	Conference State West Dotto
- ming routh (upp. (%.mp)			0000277

-----

	GLOLOGICAL SURVEY SAMPLE No.			
	FEE 9 1972	WATER V		
	1 LOCATION OF WELL			BUBLIC MEASTM
Ĭ	alhoun Bennliel	LP_	SE	
	Distance And Direction from Road Intersections			arthur Eifler
	46 Minwellst Battlale	sels M	1ich	46 mixuell
<u>_</u>	Lecate with "A" in suction below Sketc	h Map:		4 WELL DEPTH: (cumplated) Date of Completion
	<mark>┃ ├</mark> ╼╃╾╬╾╬╌┩			5 Cable tool Rotary Driven Due
	<b>┦</b> ┍┼╴┥╴┆╴┤╤╾			6 USE: Domestic Public Supply Industry
J			-	Test Well
				7 CASING: Threaded Welled Height: Above/Selow
	FORMATION	THICKNESS	BEFTH TO BOTTOM OF	Surfaceft. Lin. 10ft. Dopth Weightfbs./ft.
	<u> </u>	STRATUM	70	in. toft. Death   Drive Shae? Yes No
_	gravel	300	ررين	Type: 0:a.:
	Sand rock	50	80	Slot/Gauzeft, andft.
				Fittings:
_				9 STATIC WATER LEVEL ft. below land surface
ť				10 PUMPING LEVEL below land surface 2 ft. after hrs. pumping 20 s.p.m.
`			<u> </u>	
				11 WATER QUALITY IN Parts Per Million:
~		<del>                                     </del>		Iron (Fe) Chlorides (Ct)
,	<u> </u>	<u> </u>		HardnessOther
	· ·	ļ		Pittess Adapter 12" Above Grade
ر				13 Well Grouted?  ves  No Neat Cement  Bentonite
				Depth: From ft. to ft.  14 Nearest Source of possible contamination
				Well disinfected upon completion Rives   No
		<del>                                     </del>	<u> </u>	15 PUMP: Not installed
-		<del> </del>		Manufacturer's NameMP 74 Volta 2 30
				Length of Drop Pine de ti. capacity de G.P.M.  Type: Submersible
		<del></del>		Jet Reciprocating
	USE A ZIND SHEET IF HEEDED	<u> </u>	47 WATER	WELL CONTRACTOR'S CERTIFICATION:
1	16 Remarks, elevation; source of data, etc.	W.L.	This well	WELL CONTRACTOR'S CERTIFICATION: I was drilled under my jurisdiction and this report is true upt of my/mgg/ledge g/d belief./
,	- SELECTED BY	<del></del>	WALA RES	BY Plumber 10 - 020 BYERED BUSINESS NAME  ARESISTRATION NO.
		_ 6	Address	107 NAV ST ZOMON
•	4 *400HT39H <b>9%</b> D674 100M (Rev. 12-98)	<u>.,,                                   </u>	Signed	AUTHORIZED REPRESENTATIVE 0000275
				0000410

CI OLOGICAL SURVEY SAMPLE NO.				וררורור דד	רודוודורד
NOV 2 6 1976	WATER V				N DEPARTMENT OF
1 LOCATION OF WELL Typenship Barne		Fraction		PUBL Suction Number   Town Nu	IC HEALTH
Distance And Direction from Road Intersections	)	_	J.NE4	32 TIS	N/S. RTCJEW.
166 S. Cariton ST				Daviel Tullis	
BRITIE CREEK, MI			Address	166 S. CARITO	7 ST
	th Mag;		4 WELL DEPTH	Salle Creek	mpletion
				108 11	10-1-76
			5 Cable to		Drivan Due
<b>╏╹</b> ┠╌┽╌┽╌┽╌╬ <del>╸</del>			6 USE Spon	estic Public Supply	Industry
_			∏ test	Matien Air Condition	ne Commercial
				wady Welded He	ght; Abovi <u>chulew</u>
- je	THICKNESS	DEPTH TO	c/	4	faceft.
FORMATION	OF STRATUM	STRATUM	in. to	ft. Depth Dr.	
Sand & Gravel	25	25	8 SCREEN:	A Dia.:	
				UP Dia.: Length	
Water Gravel	1-4	29		ft. andf	h
SOFT Sand ROCK	6	35	Fittings;		
Sandstone	13	4 . 0	9 STATIC WAT		
Joand Stane	73	108	10 PUMPING L	ft, below land surface EVEL below land surface	
(			35	ft, after 🔔 hrs. pumping _	35 _ e.e.m.
	1			ft, after hrs. pumping _	9.9.5.
				LITY IN Parts Per Million:	
~ <del> </del>			Iron (Fe)	Chlorides (CI)	
			Hardness .	COMPLETION: D In An	
				Hone Adapter 502" A	reved Pit beve Grade
				41 D von 12 w	
		<u> </u>	Depth: Fre	ement   Sentonite	
			4	rce of possible contaminat	_ • •
	<u> </u>	<u></u>		Orection ST	
			15 PUMP:	Not install	
SDOUD INTO BY DRILLER, ITEM ME	1 -	<u> </u>	Manufacture Model Num	HA TO POST HAT	
*CORRECTED BY	<b></b>	ļ.———	Langth of S	rep Pipe_3011, capacit	12 c.r.u.
ELEVATION			Type: 🔀	Submersible Jet   Recipro	ocating
OFFIN TO MUCK			]		-
16 Remarks, elevation, source of data, etc.	<u> </u>			CTOR'S CERTIFICATION	1
DECEIVED		to the be	ist of my knowli	der my jurisdiction and the	
HALL KERE ARE		- 100	A I TO PS	white bing La	REGISTRATION NO.
NOV 1 2 1976		Address	184 W	- 32 TO CE	Battle Greek
Calhoun County Health Dunaster		Signed	Jarren	water on	0000279
Dare 1001Battle Creek! Mich.	· <del></del>	_	AUTHORIZED REI	MERENTATIVE	0000279

# BATTLE CREEK WATER SUPPLY SAMPLING RESULTS (RESULTS REPORTED IN PARTS PER BILLION) [BLANKS INDICATE BELOW DETECTION LIMIT]

		Dichloroethane		Trichloroethane	Dichloroet	hylene	<u>L</u>	L
LOCATION	DATE	1,1	1,2	1,1,1	Cis-1,2	1,1	Trichloroethylene	Perchloroethylene
476 N. Washington	8-18-81	2		9	10		4	4
476 N. Washington	9-3-81	2	. <1	4	12	1	5 .	2
190 E. Michigan	9-3-81	3	11	5	13	41	5	2
Plant Tap	9-3-81	1		1	10	-	4	1
Plant Tap	9-24-81	3		5				3
Plant Tap	10-5-81			1				<b>4</b> 1
Plant Tap	10-13-81			1				<b>&lt;</b> 1
Plant Tap	10-20-81	1		1				1
Plant Tap	10-27-81			1				1
Plant Tap	11-3-81		•	1			1	<1
Plant Tap	11-10-81			1				
Plant Tap	11-17-81			1				41%
	ļ	<del></del>	ļ }	<u> </u>	<u> </u>	· <b> </b>		<u> </u>
<del> </del>				<u> </u>	<del> </del>	ļ		
						<b></b>		<u></u>
	J		ļ		<del> </del>	ļ		ļ
<del></del>						<del> </del>		
<u>.                                    </u>	<del> </del>		<del></del>			<del> </del>	<del></del>	
	<u></u>		<u> </u>		<u> </u>	Д	<u> </u>	l

#### VERONA WELLFIELD SAMPLING RESULTS (RESULTS REPORTED IN PARTS PER BILLION) [BLANKS INDICATE BELOW DETECTION LIMIT]

Pag	e	1

		Dichloroethane		Trichloroethane	Dichloroet	hylene		Perchloroethylene	
LOCATION	DATE	1,1	1,2	1,1,1	Cis-1,2	1,1	Trichloroethylene	Perchioroethylene	
Well No. 13	9-24-81								
Well No. 14	9-9-81								
Well No. 15	9-24-81								
Well No. 16	9-24-81						·		
Well No. 18	9-21-81								
Well No. 19	9-9-81	-							
Well No. 20	9-10-81								
Well No. 21	9-10-81								
Well No. 22	9-10-81								
Kell No. 23	9-10-81								
Well No. 24	9-21-81			•					
Well No. 25	9-9-81	7		11		11_		6	
Well No. 26	9-10-81	10		13		2		10	
Well No. 27	9-10-81	6		5		1	. 1	5	
Well No. 28	9-21-81	1		1				1	
Well No. 29	9-9-81			<1		,			
Well No. 30	9-9-81								
Well No. 31	9-10-81			1				<1	
Well No. 32	9-11-81	12		91		4		44	
Well No. 33	9-10-81	2		6	2		11	11	
Well No. 34	9-9-81				5		2		
Well No. 35	9-9-81	6	2	11	66	2	26	3	
					<u> </u>	<b>h</b>		<u> </u>	

## VERONA WELLFIELD SAMPLING RESULTS (RESULTS REPORTED IN PARTS PER BILLION) [BLANKS INDICATE BELOW DETECTION LIMIT]

Page 2

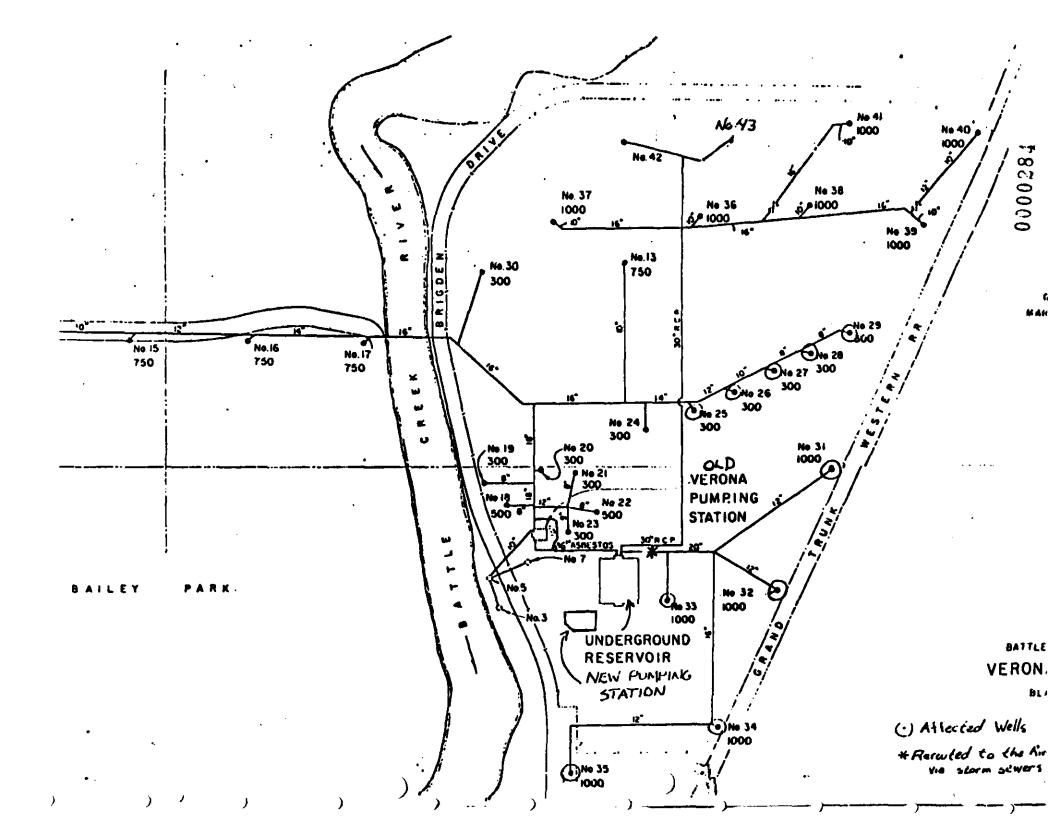
		Dichloroethane		Trichloroethane	Dichloroet	hylene		
LOCATION	DATE	1,1	1,2	1,1,1	Cis-1,2	1,1	Trichloroethylene	Perchloroethyle
Well No. 36	9-21-81							
Well No. 37	9-9-81							
Well No. 38	9-21-81							
Well No. 39	9-10-81					]		
Well No. 40	9-11-81							
Well No. 41	9-11-81		]					
Well No. 42	9-21-81							
Xell No. 43	9-9-81							
·								
						, h		

## VERONA WELLFIELD SAMPLING RESULTS Pumpage to Waste - 2.88 MGD

(RESULTS REPORTED IN PARTS PER BILLION)
[BLANKS INDICATE BELOW DETECTION LIMIT]

	}	Dichlore	oethan <b>e</b>	Trichloroethane	Dichloroet	hylene		
LOCATION	DATE	1,1	1,2	1,1,1	Cis-1,2	1,1	Trichloroethylene	Perchloroethylene
Well No. 32	10-13-81							
Well No. 35 <sup>1</sup>	10-13-81	6	2	1	66	1	26	3
Discharge to River <sup>1</sup>	10-13-81	9	1	51	30	3	11	22
Well No. 32	10-20-81	9		86	2	5_		30
Well No. 35	10-20-81	5	2	1	65	2	29	3
Discharge to River	10-20-81	7	1	51	25	4	10	22
Well No. 32	10-27-81	9		99	2	4		36
Well No. 35	10-27-81	7	3		79	1	34	3
Discharge to River	10-27-81	9	1	64	31	3	13	22
Well No. 32	11-3-81	6	2	80	1	3		32
Well No. 35	11-3-81	4		<1	57	1	25	3
Discharge to River	11-3-81	6	1	53	27	3	11	21
Well No. 34	11-10-81				5		2	41
Well No. 35	11-10-81	4	2	1	61	1	29	3
Discharge to River	11-10-81	11	1		27		12	11
Well No. 34	11-17-81				5		2	<1
Well No. 35	11-17-81	3	2	<1	54	1	24	3
Discharge to River	11-17-81	2	1		29	h	12	1

)( , document ) ( , with State funds



Page	1

		Dichloroethane		Trichloroethane	Dichloroet	hylene		
LOCATION	DATE	1,1	1,2	1,1,1	Cis-1,2	1,1	Trichloroethylene	Perchloroethylend
46 Maxwell <sup>3</sup>	10-7-81	.4	3		71		2	
46 Maxwell	10-21-81	4	5		70		2	
343 Cooper	10-7-81							
203 Paulson	10-7-81							
323 Cooper	10-7-81							
419 Cooper	10-7-81							
130 Hampton	10-7-81							
250 Livingston	10-7-81							
G.T.W. RR Yard	10-8-81							
409 Jameson	10-8-81							
G.T.W. Car Dept.	10-9-81							
145 Brigden <sup>1</sup>	10-20-81	39	11	12	298	5	150	87
125 Brigden <sup>2,3</sup>	10-20-81	149_	325		3,900	38	118	47
772 Emmett	10-20-81		1					30
1194 Raymond <sup>2</sup>	10-20-81				2			1
150 Edison <sup>2</sup>	10-20-81	35	17	14	313	3	_269	95
11 Mill	10-20-81	14	57	3				
890 Emmett	10-20-81							
186 Pickford	10-20-81							
280 S. Edison	10-20-81							
·					<u> </u>			
<sup>l</sup> Vinyl <u>[or</u> ide_pre	sent	,	<b>∜</b> le thy ler	ne Chloride reser	it )	•	3Trans-1,2-Dichloro	ethylr- present

## PRIVATELY-OWNED WELLS SAMPLING RESULTS (RESULTS REPORTED IN PARTS PER BILLION) (BLANKS INDICATE BELOW DETECTION LIMIT)

Page 2

		Dichlor	pethane	Trichloroethane	Dichloroet	hylene	 	Darah lawa akhul an
LOCATION	DATE	1,1	1,2	1,1,1	Cis-1,2	1,1	Trichloroethylene	Perchloroethylen
29 Maxwell	11-18-81							
109 Kimball	11-18-81	3		8	3	1	7 .	41
44 Mill	11-18-81				7			
127 Brigden <sup>1</sup>	11-18-81	24	32	3	1,015	4	63	47
128 Kimball <sup>1</sup>	11-18-81	27	59		789	4	32	7
136 Brigden <sup>2,3</sup>	11-18-81			12	5	1	25	12
111 Kimball	11-18-81	10		14	12	4	17	8
9 Pickford	11-18-81		1					
47 Maxwell	11-18-81							
42 Pickford <sup>1</sup>	11-18-81	29	17	11	550	7	66	71
								<u> </u>
			•					
					Ţ	¥1		
Trans-1 Dichlor	nethylen pres	sent	) 2	2-Dichlor ropa	ne preser	) · · · · · · · · · · · · · · · · · · ·	<sup>3</sup> Methyl Chloride	presen*

#### MICHIGAN DEFARTMENT OF NATURAL RESOURCES

#### INTEROFFICE COMMUNICATION

#### December 8, 1981

TO:

Battle Creek file #146-13-81

FROM:

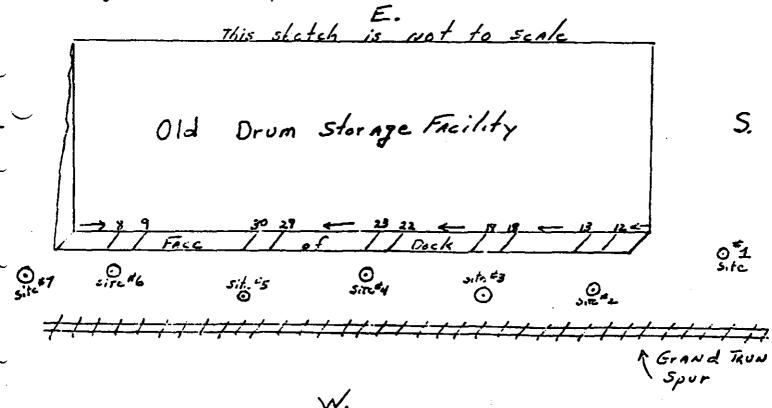
Lyle Rowell, Environmental Enforcement Division

SUBJECT: Thomas Solvents Samples

November 18, 1981, Lyle Rowell and Gene Hall made site inspection of Thomas Solvent in Battle Creek.

The purpose of this visit was to resample an area previously sampled by ECO Rumsey and Gene Hall on August 5, 1980. Samples taken at that time were not quantified and showed only trace amounts of T.C.E. and P.C.E. The area sampled is located at the Thomas Solvent, Emmett Street facility. This is the old drum storage site adjacent to a Grand Trunk spur. Drums had been stored on a dock next to the spur.

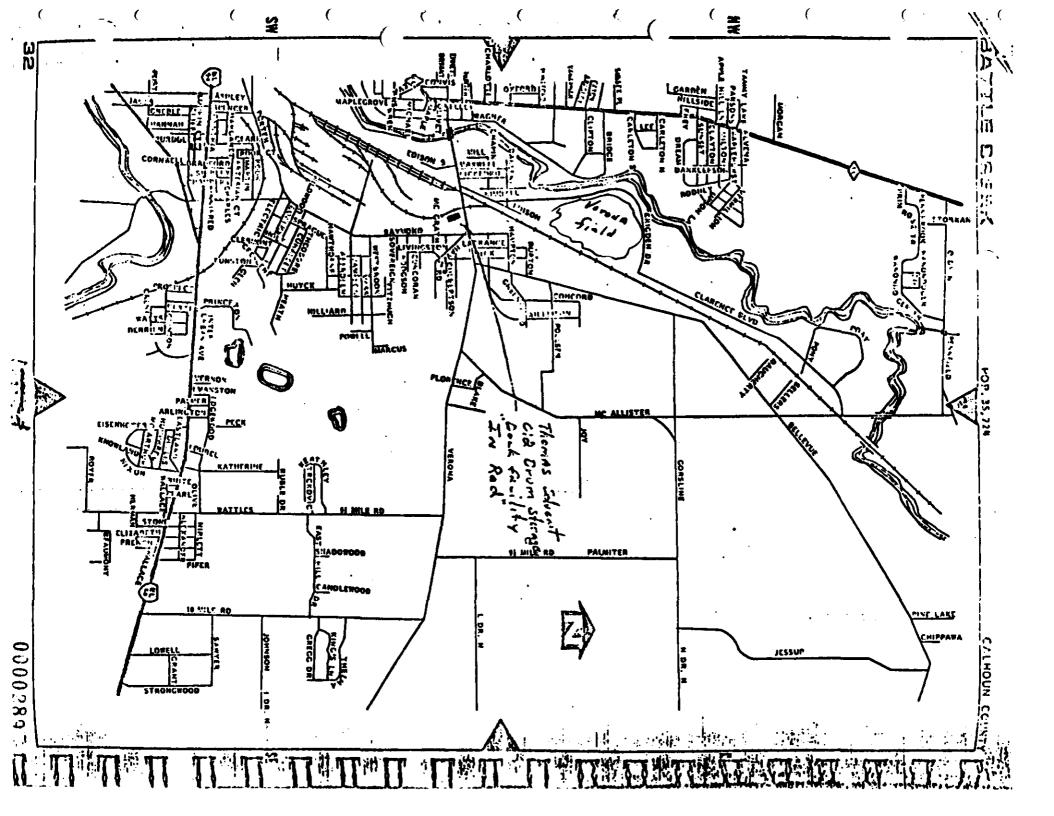
Rough sketch of area sampled:



0000287

- The first sample was taken fourteen (14) feet south of storage dock. Depth of sample 4'6" to 4'10", this sample site is located parallel to the face of the storage dock. (12:10 p.m.)
- The second sample was taken between post 12 and 13, starting at the south end of the dock counting to the north. Sample site is three (3) feet out from face of the dock, and 4'6" to 4'10" in depth, one picture was taken. (12:30 p.m.)
- 3. The third sample was taken between post 18 and 19, counting from south to north. Sample site is 3½ feet out from the face of the dock and 4'6" to 4'10" in depth, one picture was taken. (12:45 p.m.)
- 4. The fourth sample was taken between post 22 and 23 of the dock, counting from the south to the north. This sample was two feet out from the face of the dock and at a depth of 4'6" to 4'10", one picture was taken. (1:00 p.m.)
- 5. The fifth sample was taken between post 29 and 30 of the dock, counting from the south to the north. This sample was taken 3½ feet out from the face of the dock and at a depth of 4'6" to 4'10", one picture was taken (1:10 p.m.)
- 6. The sixth sample was taken between post 8 and 9 of the dock, counting this time from the north end to the south. The sample was taken 2 feet out from the face of the dock and at a depth of 4'6" to 4'10", one picture was taken. (1:28 p.m.)
- 7. The seventh sample was taken three (3) feet n/w of the north end of the dock at a depth of 4'6" to 4'10", one picture was taken. (1:45 p.m.)
- 8. Duplicate samples were given to Mr. Ronald Byersmith, a representative of Thomas Solvent. Mr. Byersmith was present during the time of sampling.
- Process used in sampling per Dr. James Bedford's instructions. (D.N.R. lab)
- 10. Samples were taken after verbal consent by Mr. Richard Thomas. Those present at Thomas Solvent besides Gene Hall and Lyle Rowell were Mr. Ronald Byersmith, Mr. Richard Thomas and Mr. Larry Charkowski.

LR:dr



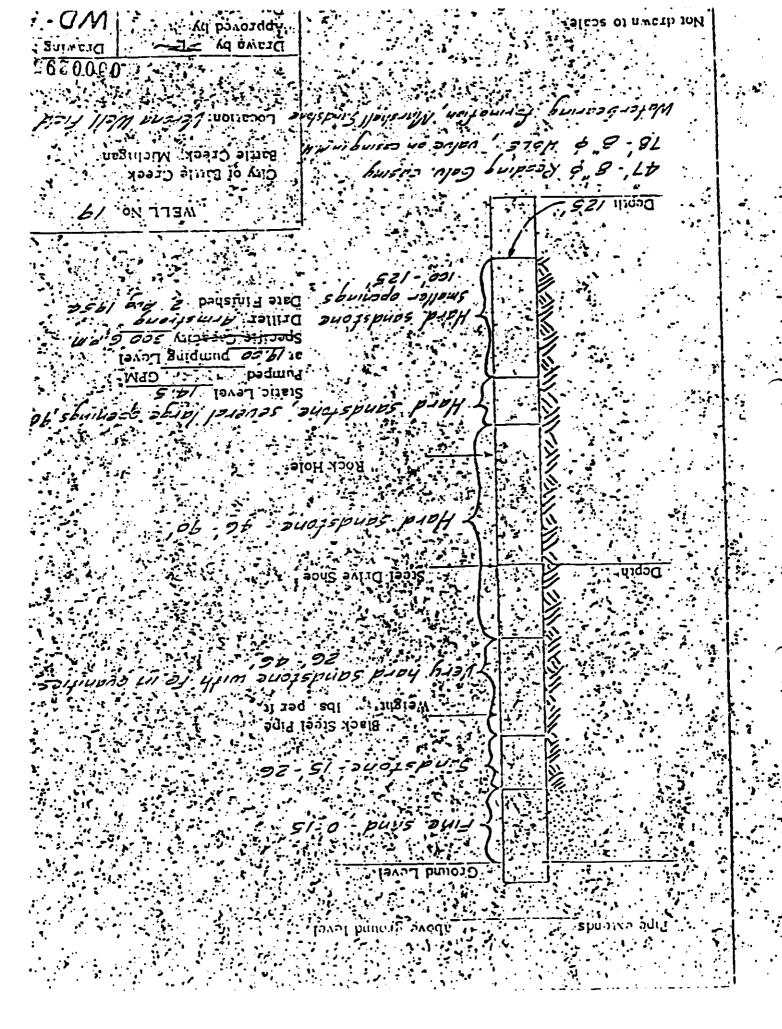
			FUNCH					"IMA LISTART LIDATE	LE RIS E		UPI EN	1.1	ME DE	.F-			vol. IV		)ji evic [6-1342	!!A-!.
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						C06		-	ļ			[	[	:	110'11			·	ļ	
	_!			<u>'</u>	<u> </u>	C07		-				[		ji	11672				]	ļ
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	Verette					<u>:C10</u>		. <u>!</u>	<u>i</u>	-	64p.==								;	<u> </u>
	A-1260!	DDE	. DOD	. DDT				LRDN! H	i CB !	جــــــــــــــــــــــــــــــــــــ	bes		:-	N==	. 405	. 4.6	Su Cine	- Jestor		
•	VG/1:G !	P.P/-	DDD P.P'- UG/KG 39311	0.P/-	DDT VO/KG 39301	ונם	DRN CH	ILRDN H	CB /KG 701	S.L. CHU3	CHCH	PC	:-	ひゃっ	TCE	TCE #	sal cuaque	cu <sub>3</sub>		
	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	<u> </u>		PC	E P		TCE	<b>:</b> .	cu cifue	inester.		
	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	6100	CHC	9C	E P 1	LE	rnd	#	en capac	Chy		
;	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	<u>5</u>	1100 CHCH	37 ( 510	E P 1	(E	i .	#	sub- cu,cupue	cng		
2	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	5 6200 1700	1100 1100 CHCH	37 ( 510	E P 1	6 3	rnd	#	en colore	cus		
	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	5 6200 1700	1100 220 540	37 ( 510	E 9 7 7 1 6 5 3	6 3	rnd	#	2.5			
	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	5 6200 1700	1100 220 540	37 ( 510	E 9 7 7 1 4 5 5 3	6 3	rnd	#	2			
	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	5 6200 1700	1100 220 540	37 ( 510	E 9 7 7 1 4 5 5 3	6 3	rnd	#	2			
	PČB ! UG/NG !	P.P/-	P.P'-	0.P/-	DDT	ונם	DRN CH	ZKO U	/KG	5 6200 1700	1100 220 540	37 ( 510	E 9 7 7 1 4 5 5 3	6 3	rnd	#	2			

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i		. 1 5	
ŧ .	Pipe extends		above ground level.
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J			Soil & Sand - 0-14"
			r Soil = Sand - O-14
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			1211
1			
			" Plack South Ding
1		1. Kr	Black Steel Pipe
1			Weight lbs. per nt.
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I.		<b>XY</b> 1	
J		· (')	
1		・ソー・サ	
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1		<b>7</b>	
1 .		$X \cup X \cup X$	
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1	Depth 17.5	1	Stoel Drive Shoe
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I		<b>(\)</b>	
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1			> Sandstone - 14-125
1			
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			/Z "Rock Hole
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			/Z "Rock Hole
		الاجالات	/Z "Rock Hole Static Level 7
			/Z "Rock Hole
			Rock Hole  Static Level 7  Pumped GPM
			Static Level 7  Pumped GPM  at pumping Level
			Static Level 7  Pumped GPM  at pumping Level
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.P.M.
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.P.M.
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.R.M.  Driller Ounbar
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.P.M.
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.R.M.  Driller Ounbar
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.R.M.  Driller Ounbar
			Static Level 7  Pumped GPM  at pumping Level  Specific Cupacity 750 G.P.M.  Driller Dunbar  Date Finished 11-23-1936
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.R.M.  Driller Ounbar
			Static Level 7  Pumped GPM  at pumping Level  Specific Cupacity 750 G.P.M.  Driller Dunbar  Date Finished 11-23-1936
			Static Level 7  Pumped GPM  at pumping Level  Specific Cupacity 750 G.P.M.  Driller Dunbar  Date Finished 11-23-1936
			Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Driller Ounbar  Date Finished //-23-/936
	Dunth 127		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Driller Ounbar  Date Finished //-23-/936
	Depth 127		Static Level 7  Pumped GPM  at pumping Level  Specific Cupacity 750 G.P.M.  Driller Dunbar  Date Finished 11-23-1936
	Depth /27		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Driller Ounbar  Date Finished //-23-/936
	Depth /27		Static Level 7 Pumped GPM  at pumping Level Specific Capacity 750 G.P.M. Driller Ounbar Date Finished //-23-/936  WELL No. /3
	Depth /27		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Driller Ounbar  Date Finished //-23-/936
	Depth 127		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Driller Ounbar  Date Finished //-23-1936  WELL No. /3  City of Battle Creek
	Depth /27		Static Level 7 Pumped GPM  at pumping Level Specific Capacity 750 G.P.M. Driller Ounbar Date Finished //-23-/936  WELL No. /3
	Depth 127		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Driller Ounbar  Date Finished //-23-1936  WELL No. /3  City of Battle Creek
	Depth 127		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Oriller Ounbar  Date Finished //-23-1936  WELL No. /3  City of Battle Creek  Battle Creek, Michigan
	Depth 127		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Oriller Ounbar  Date Finished //-23-1936  WELL No. /3  City of Battle Creek  Battle Creek, Michigan
	Depth /27		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Driller Ounbar  Date Finished //-23-1936  WELL No. /3  City of Battle Creek
	Depth 127		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Oriller Ounbar  Date Finished //-23-1936  WELL No. /3  City of Battle Creek  Battle Creek, Michigan
	Depth /27		Static Level 7 Pumped GPM  at pumping Level Specific Capacity 750 G.R.M. Driller Ounbar Date Finished //-23-/936  Shale 125-127  WELL No. /3  City of Bartle Creek Bartle Creek, Michigan Location: Verona Well Field
	Depth 127		Static Level 7 Pumped GPM  at pumping Level Specific Capacity 750 G.R.M. Driller Ounbar Date Finished //-23-/936  Shale 125-127  WELL No. /3  City of Bartle Creek Bartle Creek, Michigan Location: Verona Well Field
	Depth /27		Static Level 7  Pumped GPM  at pumping Level  Specific Capacity 750 G.2M.  Oriller Ounbar  Date Finished //-23-1936  WELL No. /3  City of Battle Creek  Battle Creek, Michigan
	Depth 127		Static Level 7 Pumped GPM at pumping Level Specific Capacity 750 G.2M. Driller Ounbar Date Finished 11-23-1936  Shale 125-127  WELL No. /3  City of Battle Creek Battle Creek, Michigan Location: Verena Well Field
	Depth 127		Static Level 7 Pumped GPM at pumping Level Specific Capacity 750 G.2M. Driller Ounbar Date Finished 11-23-1936  Shale 125-127  WELL No. /3  City of Battle Creek Battle Creek, Michigan Location: Verena Well Field
			Static Level 7 Pumped GPM at pumping Level Specific Capacity 750 G.2M. Driller Ounder Date Finished //-23-/936  Shale 125-127  WELL No. /3  City of Battle Creek Battle Creek, Michigan Location: Verena Well Field  Drawn by Drawing No.
	Not drawn to scale		Static Level 7  Pumped GPM  at pumping Level Specific Capacity 750 G.P.M.  Driller Ounbar  Date Finished 11-23-1936  Shale 125-127  WELL No. /3  City of Buttle Creek Battle Creek, Michigan  Location: Veron Well Field  1000291  Drawn by Gran Well Field
	Depth 127  Not drawn to scale All depths measure		Static Level 7  Pumped GPM  at pumping Level Specific Capacity 750 G.P.M.  Driller Ounbar  Date Finished 11-23-1936  Shale 125-127  WELL No. /3  City of Buttle Creek Battle Creek, Michigan  Location: Veron Well Field  1000291  Drawn by Gran Well Field

Tipe extends
Ground Level
Qa-10 Sand, Yellow, Soft.
10-20 Gravel, Yellow, Soft.
10-20 Gravel, Tellow, Gray, Hard.
Weight lbs. per ft.  Norse Gray, Soft.
Neight lbs. per lt.  30-38 Sand Coarse Gray, Soft.  30-38 Sand Coarse Gray, Hard.  38-40 Sands lone, Gray, Hard.  40-43 do madium  do madium
40-43 do madium 43-50 do do
Depth Steel Drive Shoe
50-85 - Sandstone
Rock Hole
65.91-Sandstone, Gray Some caving
pumping Level
Specific Capacity 750 Cunbar 91-123-Sandstona Driller R. Cunbar & D. Cunbar 1939
Date Finished Jan 1939 Started Jan 1939
123-124 Shale, Sticket WELL No. 14
129 129 129 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Depth 129 Shale, Sticky City of Brute Creek, Michigan
Location: Verona Well Field
Barky Park 0300292
Note-Revised to conform Druwn by Fro Drawing No.
Mphoto. 1
Not drawn to scale Date 1

above around level. Ground Level 0.5 - Sand, Pullow, Sort 5-10 - Sand, Yellow 10-20 - Fine Gravel, Yellowish White, Soft Gravel, White, Sort 12 " Black Steel Pipe Weight lbs. per (1. Grave) - 30-32 - Coarsa Grave! 32-35 - Sandstone, Gray Soft. 35-80 - Sundstone, Gray Steel Drive Shoe 80-90 - Sandstone, Gray, Soft 90-95 - Sandstone, Gray Static Level . 95-127-Sandstone 2 750 pumping Lavel Sume cave in at Specific Conscity 750 G.P.M. Drille: R. Dunker & D. Dunbur Date Finished, Feb 23, 1939 Started don. 1739 127-141 Sandstone, Shele formerly well. "C City of Bothe Creek 141 Shale Barrle Creek, Michigan Location: Verona Well Field Barley Park . 0000293 Drawing No. Drawn by 35 ~ Approved by WO.s. Not drawn to scale Date., All depths measured from Ground Level

	The first of the control of the cont	• • •
<u> </u>		
<b>≥</b> ,		
	Pipe extendsabove ground level.,	
٠.,	Ground Level	
•		
••	Fine sand 0:14	
• •	Soft sandstone, 14-19	
	Soft Sand	
". •	Black Steel Pipe	, . <u>.</u>
	Weight lbs. per ft.	
;; 		
د. ز	Very hard saidstone - 19:00	
		·
	Steel Drive Shoe	25
•	Depth	-
•		•
ره .		
7,		
		· .
	Rock Hole	
	Softer Sandstone Staric Level	
١.	many openings Pumped GPM.	•.
1:	80-110 at pumping Level Specific Capacity 500 G.P.M.	7
1	Driller Driller	. • . •
1.	Dara Finished 1919	
	Fine ordined	• • • • • • • • • • • • • • • • • • • •
1	Sandstone fewer openings, It	
: [	WELL No. 18	
$\cdot$	Depth 126 - 126	
	City of Buttle Creek	
	45 - 10" & BYERS & READING GALL. Bottle Cicek, Michigan	
. "		iold
	BI'- 8" & HOLE Location: Varona Well F	
`	A STATE OF THE PARTY OF THE PAR	
1	0.500	
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N	Approved by AAZ	0-5
	Not drawn to scale All depths measured from Ground Level  Date	
1	The section of the se	



Pipe extends	above ground level.
June 1	Ground Level
	Quicksand : 10
1.2	Boullers 10:12
	I we we balle there
	Medium Hard sandsfane - Quicksand runs in badly thru openings - 12 - 43!
	A State of Black Steel Pipe
	Weight . Ibs. per ft.
Depth	Steel Drive Shoe
	Hard Sandstone - 43-105
	Rock Hole
	Staric Level
	Pumped & GPM
	Clay & Queisand at puinpurg Level  Specific Canacity 300 G.P.M.
	Driller Date Finished 1915
No.	Medium Hard
	Sandstone - 107-131
	MEI I No. 2/
Depth /3/	WELL No. 2/
	City of Battle Creek  Battle Creek, Michigan
	Galv. Cusing
83-8" é Hole	Location: Verona Well Field
	0000297
	Drawn by JE
Not drawn to scale	Approved by
All depths measured from	Sround Level.

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<b>-</b> .	
	Pipe extends above ground level.
	Ground Level
	Very time sand - 0-30
	Large Boulder
	Black Steel Pipe
	- Weight Ibs. per ft.
	Fine Pellow Sand - 30 - 40.5
-	
••	Yellow Sandstone 40.5-47
$\mathcal{L}$	Blue Sandsfone - 47 - 65
	Steel Drive Shoe
	Boulders 65.70
<i>i</i> •	
	Rock Hole
- V	
	11 111 - condetone - 70-113
	Hard blue Sandstone - 10-113
	Pumped CPM
يد ند.	pumping Level
	Specific Capacity 500 G.P.M.
$\smile$	Date Finished 1916-1919
•	
	Depth 1/3 WELL No. 22
'فوج اح <u>نی</u> د ده	76 - 10 \$ Byers GALU. LASING City of Brule Creek
_	6-10" & HOLE Rattle Creek, Michigan
J	11-8" & HOLE Location Verona Well Field
-	
٠ : ·	9000295
·	Drawn by Frame Drawing No
	Not drawn to scale at the second second by the second seco
	All depths measured from Ground Level Date 1: 170-5
	grande de la companya de la companya de la companya de la companya de la companya de la companya de la company La companya de la companya de

Pipe extends above ground level, Ground Level Quicksand . 0:30 " Black Steel Pipe Weight this per ft. Soft Sandstone - 39 - 43 "Steel Drive Shoe Rock Hole Static Level at ... pumping Level Specific Capacity 300 G.P.M. Date Finished 1913 Note: - Sandstone began to get soft near 110' depth so quit for fear of young thru to ducksand WELL No. 23 .8" & Galv. casing driven to 46. below surface Ciry of Battle Creek Battle Creek, Michigan Location: Verona Well Field Drawn by ... DE

	5.0
	7 8 9
Na O TO	Michigan No. 20 Michigan No. 2
Supplied to the supplied to th	
State To Driller	
The Shoot House Sh	
	S d d d d d d d d d d d d d d d d d d d
	Dawn Contraction of the contract
	7.5 Ž.₹.

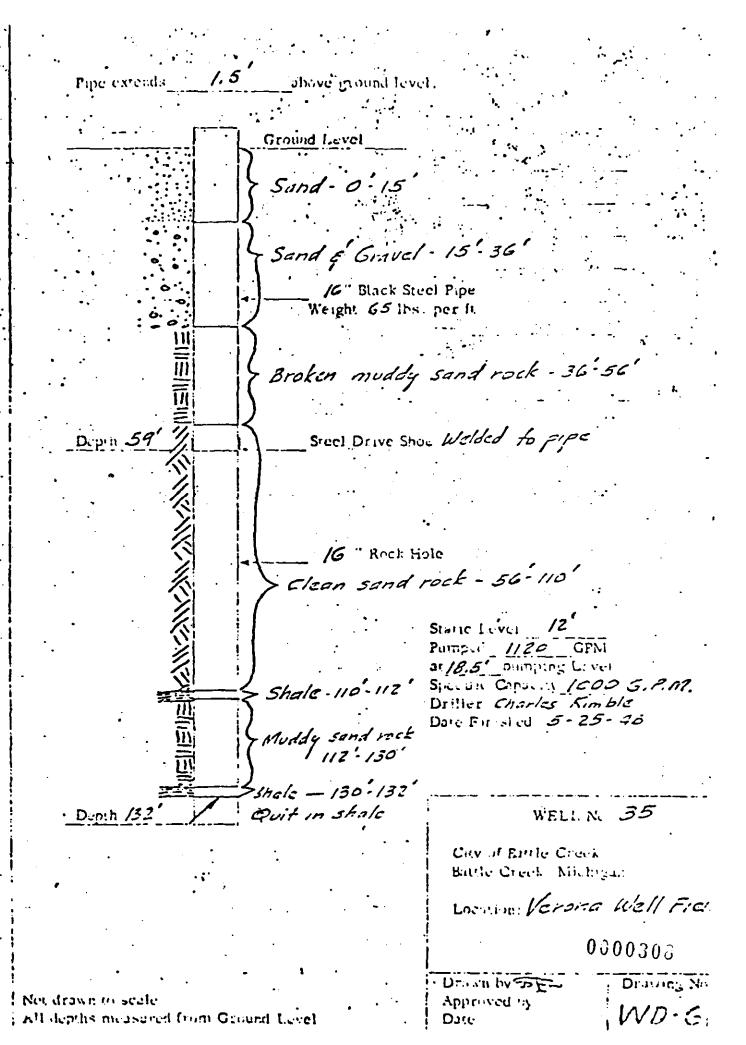
Tipe extends  The extends  The extends  Told Sands of R	Doub  Rock Hole  Rock Hole  Long Sond Character of Character Chara	Den'h 1165 - 1 0000 000 000 000 000 000 000 000 00
		2 5

Pipe extends
Ground Level
The state of the s
Sand 0-10
Sand & Gravel - 10 - 26
Black Steel Pipe
Weight ths. per fer
Sandstone mixed with Sand - 26-46
Hard Sandstone 2 - 1 genings 46 - 66
Depth Steel Drive Shoe
Yellow Sandstone - Several small epenings - 66-31
Rock Hole.
Hard Blue Sands fine Staric Level _ 14.70
Sufficient opposings to Pumped GPM
Carry away all assume at pumping Level  Specific Capacity 300 G. F. M.
Driller
Date Finished 1926
Depth - 115 WELL No. 25
46-8" BYERS GALV. CIRSING Burle Creek 0000302.
69-8 & Hole.
Location: Verona Well Field
Drawn by Drawing No
Not drawn to scale " " " " Approved by

Ground Level Muddy Sand-0-30 Weight 65 lbs. per ft. Clean Sand - 30-50' Sand & Gravel-50-53 Muddy broken sandstone - 53: 15 16" Rock Hole Clean-sand rock - 75 - 105 Static Level 10. Pumped 1034 GPM at-14-4" pumping Level Specific Capacity 1000 S.P.M. Driller Harry Ness .. Date Finished 6-8-48 Layne - Northern Co. It Mishawaka, Ind. WELL No. 3/ Depth 125 e-City of Baitle Creek Eartle Creck Michigan Location: Versna Well Field 0000304 Drawn by DEN Approved by

Mabove ground level. Pipe extends Ground Level 16 Black Steel Pipe Weight 65 lbs per ft. Depth 57 16 " Rock Hole Sand rock - 50-115 Static Level 9-Pumpal 1023 GPM at 12-8" puniping Level Specule Cipacity 1000 G.P.M. Driller Harry Ness !. Saft shale - 115-120 Date Finished 5-14-48 Layne Northern Co. Inc. WELL No. 34 Depth 120 City of Battle Creek Bartle Creek Michigan Location: Verona Well Fiel. **~-0**000305 Drawn by 本上心: | Drawing Approved by Not drawn to scale All depths incusured from Ground Level

Clay - 17-18 Gravel, sand, broken rock - 18 - 31 16" Black Steel Pipe . Weight 65 lbs. per ft Muddy sand rock - 31-Sand rock, not cleun 45-70 . Swell Drive Shoe welded on pipe Muddy sand rock - - 73 · Blue sundrack cleaner Sunc Level -Pumped 1100 GFM at 11:4" pumping Level Specific Capacity 1000 G.P.M. Driller Harry Ness & Charles Kin Date Finished 5-12-48 Sand rock & shale. Layne Northert G. Inc. Shale - 131 Shale - 131 150 City of Bantle Creek St. Battle Creek, Michigan Location: Verona Well Fix 0300300 Drawing Drawn by Approved by Not drawn to scale ... All depths measured from Ground I



	and the same of the contraction
Pipe extends	above ground level.
	Ground Level
	Yellow Sand Coarse - 0.5
16 dia. pipe	5-10
	Fine - 10-15
, A	Yellowish grey sanastone -15-20
	20-25
	Brownish grey sandstone 25-30
<u> </u>	Light gray sandstone (vary fine) 20-35
. 3	35-40
· · · · · · · · · · · · · · · · · · ·	Brown Sandstone - 40- 45
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Hand-45'-50
	Change from Grown to Grey Sandstone 50-55 3 Gray Sandstone with class 55-58'  Swel Drive Slice:
Deprh	Swel Drive Slice: Light Grey Sandstone, very fine - 58-63
	Grey Sandstone (Hard) - 63'-68'
	1 -68-73
<u> </u>	Light Grey Sandstone - 73: 78'
	Grey Shole - 81-86
	Stight Grey Sundstone & Shak -86-91'
	13 11 of " - 91 - 96"
	Zin in in suggioz Static Level 15
	246 Sample - 101-105 Pumped 1005 GPM
	Slight Grey Sands Lac 105-115 Decisic Capacity 1000 G. P.M.
1	Driller OUNSAR
	115-120 Date Finished March 1, 1957
	Shale & Sandstone, dark gray - 120-126
	-12G-131
Depth	Grey Sandstone . 131-137 WELL No 36
147'	Shale & " gray 131.145
7.00	B Gray Shale-145-147 Rattle Creek, Michigan
	Location: Versna Well Field
	20000309
Nor drawn to scale	Drawn by Drawing Approved by

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•		Locations	
	· · · · · · · · · · · · · · · · · · ·	Vecan I	1=11
Pips extends 1.5	feet above ground lave	1.	
	Ground Level	County .	•
SANO 0' +. 15'	•		• •
		Township Section	
`. }		Section	
Soft Sanditone		Pipe Tally	Welded ToreEded -
	% "Black Steel Reight lbs. p	Pipe	1/11 (2060
	neigno los. p	91 10	
· · · · ·			•
Hand Sandstone		•	
32 4069 1.00	<b>1</b>		
		•	
Depth 44'	Steel Drive Shoe	-	· · · · · · · · · · · · · · · · · · ·
}		•	• :
		•	
		•	·
	16- Rock Role	•	•
Greg Sandstone		•	
57 7. 143			<del></del>
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	} . ·		•
. • • •		•	
		Total	
		•	·
Shale			
142 40 145'		·	
Depth 145'-		ROCE REIL NO.	32
Static Level 9.5		- City Both	le-Creck.
Pumped Jong G	PM = : 210" G. 2.F" -	Vacona	Jijua
_	level after 4 hours		.000310
Dillor - Dunbas	<u> </u>	LAYNE-HORTHER	RH CO. IHE

INDIANAE

Date-Finish

Pipe exacrus	above ground level:
A Section of the sect	
	round Level.
	Frown 5and - 0-15
	rown Sandstone - 15-25
	ight oroun Sandstone 25-32 Black Steel Pipe Weight lbs. per It.
	Grey Sundstone - 32 - 40
	Light Brown Sandstone - 40-50
	Dark Grey Sandstone - 50.55
Depth	Steel Drive Shoe
	Rock Hole
	10.11.
	Light Grey Sauc Level
	Pumped 1200 GPM at 26.5 pumping Level
	Specific Capacity 1000
	Driller: DUNBAR  Date Finished 10-1-1957
	Dark Grey Sandstone - 128-133
	WELL No. 30
Depth 1/52!	Light Grey Sands Line City of Battle Creek
	Barric Creek, Michigan
	Shale - 148-152 Lucation: Verena Well Tie.
	0.000311
	Drawing Drawing
	Approved by
Not drawn to scale	

Ground Leve Yellow Sand 0-25 Grey sand & Gravel - 25-30 16" Black Steel Pipe Weight 65 ihs. per ft. Hand gray sandstone - 30'-62' Depth 42 Steel Drive Shoe Hard grey Sandstone - 62'-67 Fissure took away drillings - 65., Light grey sandstone - hard - 67-73 16" Rock Hole Light gray sandstone - 73 - 110' Staric Lavel 2/ Water taking away Pumped 🔭 drillings 90:110' at <u>25</u> pumping Level® Specific Capacity /000 G.P.M. Driller DUNGAR Daie Finished Oct. 11. 1962 Light grey sandstone-110-148 WELL No. *40* City of Baule Creek Bartle Creek, Michigan, - Blue Shale Location Verana Well Field Driller - Rulph Drummond Helper - Howard Krouse 0000312: Drawn by Approved by All depths measured from Ground Level ..

Pipe extends	above ground level
	Ground Level
	Surface dir!, light brown sand-0-18
= 17	Light grey sandslone, inedium hard -19-3
	/6" Black Steel Pipe Weight 65 lbs. per ft.
- :	
	Medium grey sandstone, hord -38-69
Depth 44'	Steel Drive Shoe
16 Pipe	
	Medium grey sands sone, hard 69-90
	/6" Rock Hole
	openings lake Static Level 21.3
	gray sandstant Specific Capacity 1000 G.P.M.
	medium hard Date Finished Oct30-1962
1	90'-125
Depth 147	Light gray sandstone, WELL No. 41
	medium hard City of Burtle Creek
	Blue shale-146-147 Baile Creek, Michigan.  Location: Varora Well Field
Drillor-Relph	

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•	•	Location:	215-0116
Pipe extends _	2 feet above ground leve	1. 50' So. of Brichde	on Road
,		Site #43	
	Ground Lavel  O-8' Brown Sam	County Calhoun	· ·
	30-8 Brown Sam	Township Pennfie	1d Twp.
	B'-14' Soft. BROW SANDSTONIE	4	
		Pipe Tally	Welded Threaded
	"Black Steel Feight lbs. p	er ft.	13'0"
. 25 '	14'-72' GRAY	SAND STONE	11' 0"
		· ·	3' 6"
Depth	Steel Drive Shoe		
			<del></del>
	72'-87' MEG'G	144 SINDSTONS	
	E7-69 Rock Hols	GRANITE ROCK	
٠.	89'-105 MEd	GRAY SANDSTON	٠
			<del></del>
<b>-</b> 0.		•	
122	105'-146 Gri	19 SANGETORE Total	27' 6"
٠,		•	
Depth /uge	146-46 Shale	ROCK WELL No	. 43
Static Level 12'			
Pumped 7002 CPM		City .	10000
at 17' pumping level after 6 hours		Battle Croek	300314
Driller Don Snyder		LAYNE NORTHER	n co. Rig
Date Finished		MICHAWAKA,	INDIANA.
irawn to scale  Manchs measured from Ground Level		APPROVED BY	DRAWING Me.

• •	
Pipe extends 1,5	alraye ground level.
Pipe extends	
رسنے کی ان اور اور اور اور اور اور اور اور اور اور	
	Ground Level
	Sand - 0-12
4, 4	)
60	Sandstone, Sand & Gravel - 12-27
- '60'	
W.	
' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	
	Black Steel Pipe
	1
-	Weight lbs per it.
11	Grey Sandstone - 27-144
	7 Grey Sanastone
* * * * * * * * * * * * * * * * * * * *	
	Steel Drive Shoe
Depth	The steel Dille state of the st
111	
	"Rock Hole
· · · · · · · · · · · · · · · · · · ·	
	Static Level 15
	Pumped 1050 GPM
	Pumped 7030 that
	at 21' pumping Level Specific Capacity 1000 G.F.M.
	Specific Capacity /
$\mathbf{x} = \mathbf{x} \cdot \mathbf{y}$	The first of the control of the cont
. 3	Date Finished AUS 2, 1960
3	A CALL TO THE REPORT OF THE PARTY OF THE PAR
~ >	
4	WELL No. 39
Depth	
145' onsu	Blue Shake Com of Boute Creek
	City of Indicate Constant
	Battle Creek Michigan
	1.1 11 = .7
	Lucation: Verona Well Field
	0500315
•	
	Drawn by D. E. N.   Drawing No
•	
Nor drawn to scale	
	Date Date