

AMBIENT AIR SAMPLING

VINYL CHLORIDE MONOMER

Baton Rouge North Works

June 7 - July 5, 1974

ASI 00004503

AMBIENT AIR SAMPLING FOR VINYL CHLORIDE MONOMER

I. GENERAL

The purpose of these tests was to determine the general exposure and concentration of vinyl chloride monomer in the ambient air at varying plant operating conditions and at various locations in the plant and the surrounding environment. Samples were taken under normal operating conditions. The vinyl chloride monomer plant had a total shutdown from 10:15 p.m. on June 11, 1974 to 8:00 p.m. on June 25, 1974. Samples taken during this period reflect only loading, maintenance operations and effect of other vinyl producers in the area on ambient air quality.

II. CONCLUSIONS

- A. The area with the most significant amounts of vinyl chloride is at the tank car loading dock. This occurs during venting of the cars. The highest concentration found was a 90 minute sample taken on 7/5/74 which showed 15 ppm VCl.

To temporarily reduce this condition, piping has been arranged to hook up the car vents to a line that runs through the plant to the flare pond where the VCM will be burned. A G.O. has been prepared and is in Morristown for an EDC adsorption system for all vents that contain vinyl chloride in the plant. This should reduce emissions at the tank car loading platform to a minimum.

- B. Vinyl chloride was found in the production area in the range of 0.3 - 3.2 ppm. The higher concentrations were found during tank car loading on venting. During periods when there was not any loading, the highest concentration found was 0.5 ppm.
- C. Out of nine samples run on the plant perimeter, only one sample, that at the NE corner showed any vinyl. This sample had 0.6 ppm. The wind was from the south at 20 mph at the time these samples were taken.
- D. No detectable quantities of vinyl chloride were found in samples taken in the industrial and outlying sections of Baton Rouge.
- E. The OVA total hydrocarbon analyzer is usable only where concentrations of vinyl chloride are in excess of 15 ppm. The recorder's chromatographic peak is too small to differentiate between lower concentrations.

III. ANALYSIS

A. Sampling Equipment

- 1) Two types of sampling equipment was used. A grab sample (G) was obtained using 500 ml evacuated glass sampling bombs with teflon stopcocks. The stopcock was opened in the area in which the sample was obtained.

- 2) Six liter plastic sampling bags (B) were purchased from Anspec Co., Ann Arbor, Michigan and connected to the positive side of a MSA Model S personnel monitoring pump. A continuous sample was taken over a period of 25-30 minutes.

B. Chromatograph

- 1) All samples were run on a Model 2200 Bendix Chromatograph using hydrogen flame ionization detector.
- 2) At different times three different columns were used:
 - a. 1/8" x 25' SS column of 30% SE52 on Gas Chrom Q 80/100 mesh.
 - b. 1/8" x 10" SS column of 30% Ucon 550X on Chromosorb W 60/80 mesh.
 - c. 1/8" x 21' SS column of 25% Pluronic P-84 on Chromosorb P 60/80 mesh.

The majority of the samples were run on the Ucon column as the other two had a tendency to bleed and cause an unstable base line.

3) Operating Conditions

- a. Oven temperature 65°C
- b. Injection port temperature 100°C.
- c. Detector temperature 150°C
- d. Helium flow 27 ml per minute

C. Gas Sampling

- 1) All samples were removed from either glass bomb or bag through rubber septums using either a 1/2 or 2 1/2 ml Hamilton gas tight sampling syringes.

D. Standardization

- 1) Standardization was made by using a prepared standard prepared by Gas Analytical Services, Department of Airco Industrial Gases, Baton Rouge, La. The standard contained 40.5 ppm of vinyl chloride in nitrogen on a volume to volume basis.

E. Detection Limits

- 1) Peak areas of sufficient size were obtained for 50 parts per billion (0.050 ppm). Accuracy and standard deviations were not determined. Below this value the results are called trace.

IV. SPECIFIC TESTS

- 1) Test No. 1 - VCM Area
- 2) Test No. 2 - VCM Area
- 3) Test No. 3 - General Plant
- 4) Test No. 4 - General Plant
- 5) Test No. 5 - Specific Test
- 6) Test No. 6 - Surrounding Area
- 7) Test No. 7 - Area Industry Testing (Work's Vinyl plant down)
- 8) Test No. 8 - Area Industry Testing (Work's vinyl plant down)
- 9) Test No. 9 - Balloon Testing
- 10) Test No. 10
- 11) Test No. 11
- 12) Test No. 12 - Sample Room

Test No. 1 - VCM Area

June 7, 1974

Time: 09:00

Weather - Temperature 87°F, winds S @ 12 mph.

Vinyl chloride was being loaded into tank cars.

<u>Sample Points (Gas Collection bombs used)</u>	<u>Results - ppm VCl</u>
No. 1 Downwind of oxy, direct and wash train	3.2
No. 2 Downwind of EDC sump	0.3
No. 3 Downwind on hill behind cracking	0.5
No. 4 Downwind of neutralization pond	0.7
No. 5 Ten ft. downwind of VCl load ramp	2.1
No. 6 Downwind of VCl loading ramp on road between VCM and Cl ₂ -OH	0.6
No. 7 Downwind of off spec bullets	0.6
No. 8 Upwind behind VCl loading and caustic cooling tower	2.5
No. 9 Downwind of Vinyl spheres	0.4
No. 10 Downwind of EDC storages (crude)	0.5
No. 11 Downwind of pumps and scrubber	0.6
No. 12 In front of caustic/chlorine north control room	Trace*

* Trace = <50 ppb

See attached map.

5

W

Test No. 2 - VCM Area

June 7, 1974

Time: 1330

Weather - Winds south at 12 mph

Not loading VCl tank cars.

<u>Sample Points (Gas Collection bombs used)</u>	<u>Results - ppm VCl</u>
No. 1 VCM Control Room	Trace *
No. 2 Between VCl and HCl Column (Purification)	Trace
No. 3 West past Heads Column (Purification)	Trace
No. 4 Downwind Lights Reflux - 2nd floor	Trace
No. 5 Downwind Heads Reflux - 2nd floor	0.5
No. 6 Downwind Cracking Unit	Trace
No. 7 Downwind Cracking Unit - 2nd floor	Trace

See attached map.

Test No. 3 - General Plant

June 8, 1974

Time: 0900

Weather - Winds south at 20 mph

<u>Sample Points (Gas Collection bombs used)</u>	<u>Results ppm VCl</u>
No. 1 Downwind NE corner of property line at RR tracks	0.6
No. 2 Downwind north of VCM lab by RR track	Trace*
No. 3 Downwind north of VCM control room on Indian Mound	Trace
No. 4 Downwind north of neutralization pond	Trace
No. 5 Upwind on south end of river dock	Trace
No. 6 Upwind south of SA storage	Trace
No. 7 Upwind at SE corner of property line below SA building	Trace
No. 8 Upwind at intersection of GSU road at RR tracks	Trace
No. 9 North end of central parking lot	Trace

* Trace = <50 ppb

See attached map.

#1

#2

3

#4

#6

8200
8000
7800
7600
7400
7200
7000
6800
6600
6400
6200
6000

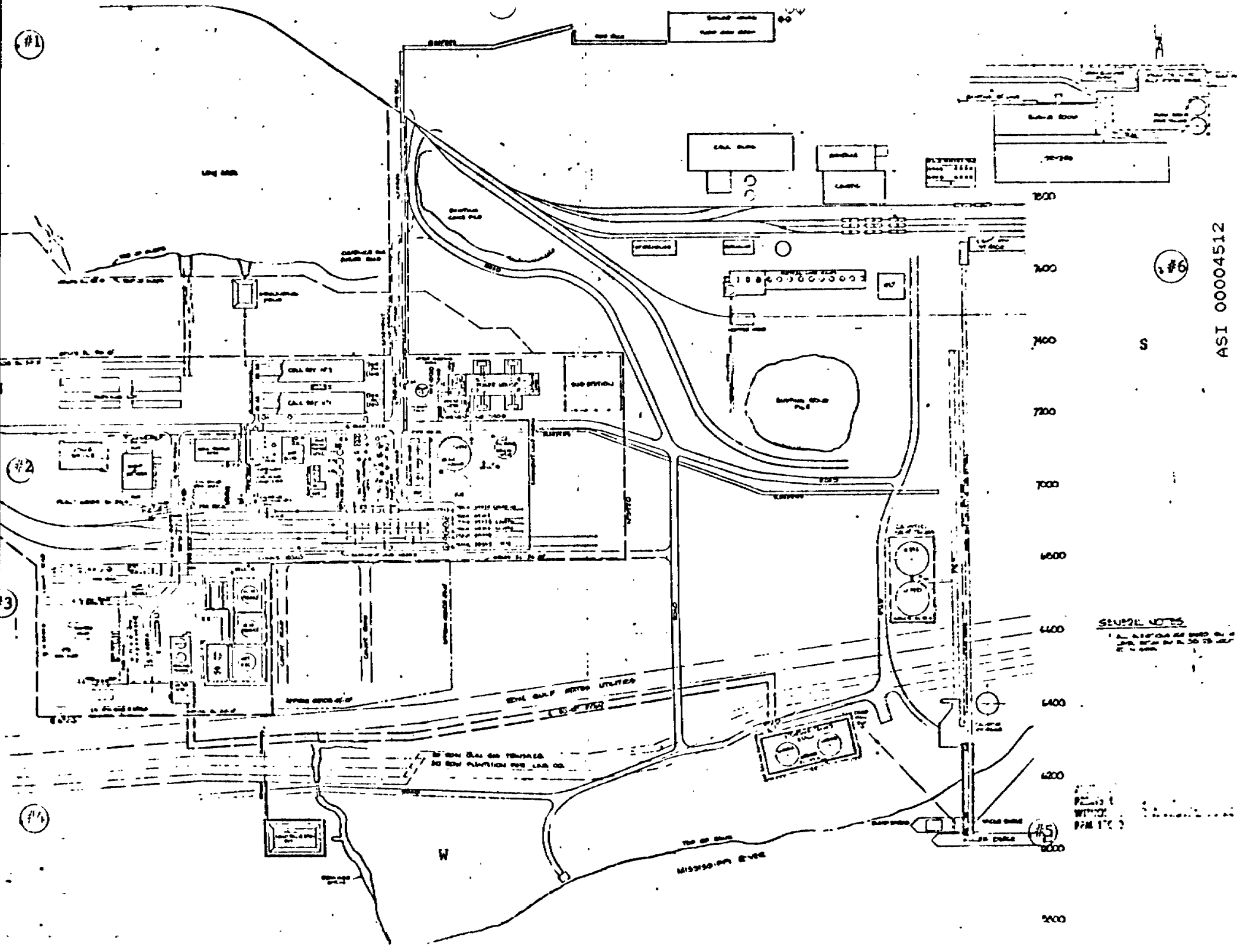
ASI 00004512

STUDY NOTES

ALL INFORMATION ON THIS MAP IS
CLASSIFIED BY 10-20-75
BY 10-20-75

PLANS
WITHIN
P.M. 1723

#5



Test No. 4 - General Plant

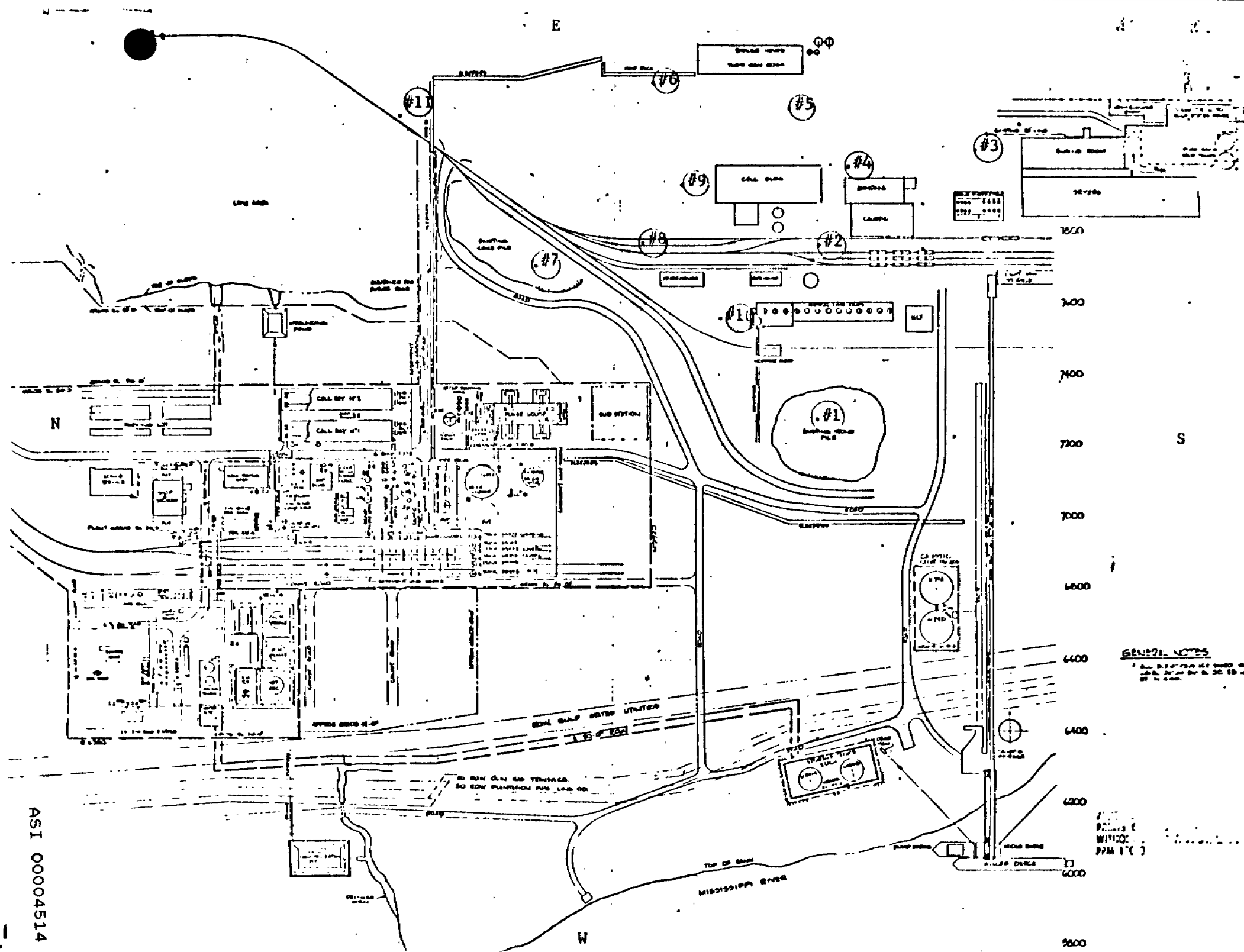
June 8, 1974

Time: 1200

Weather -- Winds - south at 10-12 mph

<u>Sample Points (Gas collection bombs used)</u>	<u>Results ppm VCl</u>
No. 1 Top of limestone pile	Trace*
No. 2 On railroad tracks south of M&I shed	Trace
No. 3 North of S.A. building	Trace
No. 4 South end of old cell building (South)	Trace
No. 5 North end of machine shop	Trace
No. 6 On railroad tracks at north end of power house (south) and chlorine loading	Trace
No. 7 On railroad tracks north of coke pile	Trace
No. 8 By railroad tracks on north end of garage.	Trace
No. 9 North end of south cell building	Trace
No. 10 North end of lime kiln	Trace
No. 11 North of railroad maintenance shanty	Trace

See attached map.



GENERAL NOTES

1. ALL DISTANCES ARE BASED ON
 2. ALL DISTANCES ARE BASED ON
 3. ALL DISTANCES ARE BASED ON

PRINTED
 WITHIN
 9PM 17C

ASI 00004514

Test No. 5 - Specific Test

June 10, 1974 and June 27, 1974

- 1) A gas collection bomb was used to take a sample in the G. C. room of the VCM lab.

Results:	6/10/74	3.9 ppm VC1
	6/27/74	Trace

Test No. 6 - Surrounding Area

June 19, 1974

Time: 0915

Weather - Winds west to northwest at 2 mph, temperature range 84°-86°F, partly cloudy, showers across Mississippi River

In this test, the OVA analyzer was used with the column for VCl readant. A total H/C readout was recorded from the analyzer and a gas collection bomb was taken and run on the gas chromatograph. (The OVA analyzer was set for VCl reading).

No. 1	NE corner of Works property	OVA Readout - 30 ppm H/C OVA Column - <15 ppm VCl Bomb Sample X - Interference on G.C.
No. 2	Caught on road downwind of VCL loading	OVA Readout - 30 ppm H/C OVA Column - <15 ppm VCl Bomb Sample XI - Interference on G.C.
No. 3	Caught in SE corner of Works property	OVA Readout - 45 ppm H/C OVA Column - 15 ppm VCl Bomb Sample IX - Interference on G.C.
No. 4	Caught on Scenic Highway across from Exxon Chemical. (Ether odor in area)	OVA Readout - 40 ppm H/C OVA Column - <15 ppm VCl Bomb Sample VII - 50 ppb
No. 5	Caught on Airline Highway 1/4 mile west of Old Miss. River Bridge (Rain)	OVA Readout - 12 ppm H/C OVA Column - <15 ppm VCl Bomb Sample III - 50 ppb
No. 6	Caught in Port Allen across river from state capitol	OVA Readout - 15 ppm H/C OVA Column - <15 ppm VCl Bomb Sample XII - 50 ppb
No. 7	On new Mississippi River bridge	OVA Readout - 20 ppm H/C OVA Column - <15 ppm VCl Bomb Sample I - 50 ppb
No. 8	On LSU campus by drill field	OVA Readout - 20 ppm H/C OVA Column - <15 ppm VCl Bomb Sample II - 50 ppb
No. 9	On Interstate 110 across from Exxon Refinery	OVA Readout - 30 ppm H/C OVA Column - <15 ppm Bomb Sample II - 50 ppb

Test No. 6 (Continued)

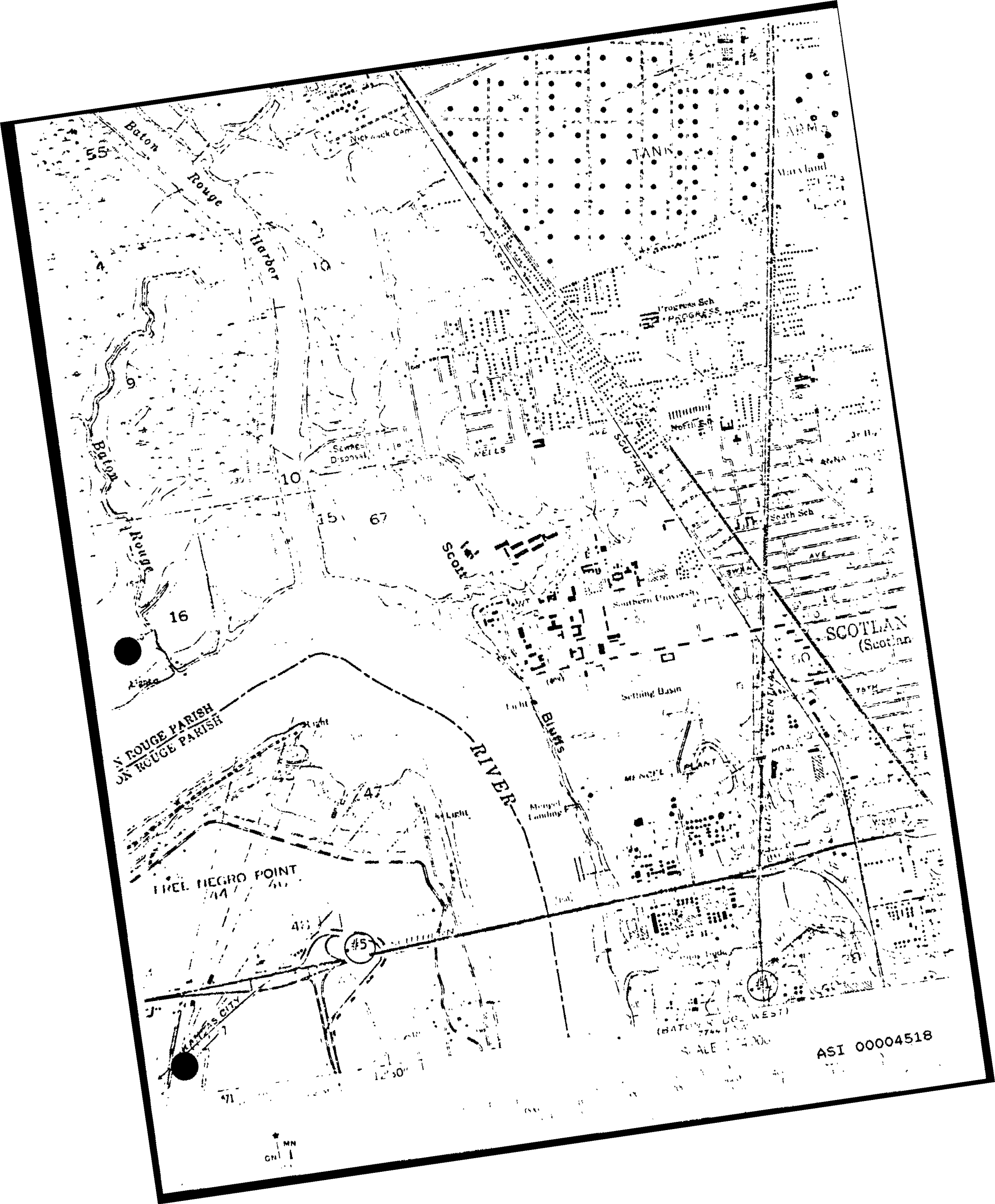
No. 10 Plank Road and Evangeline
Intersection

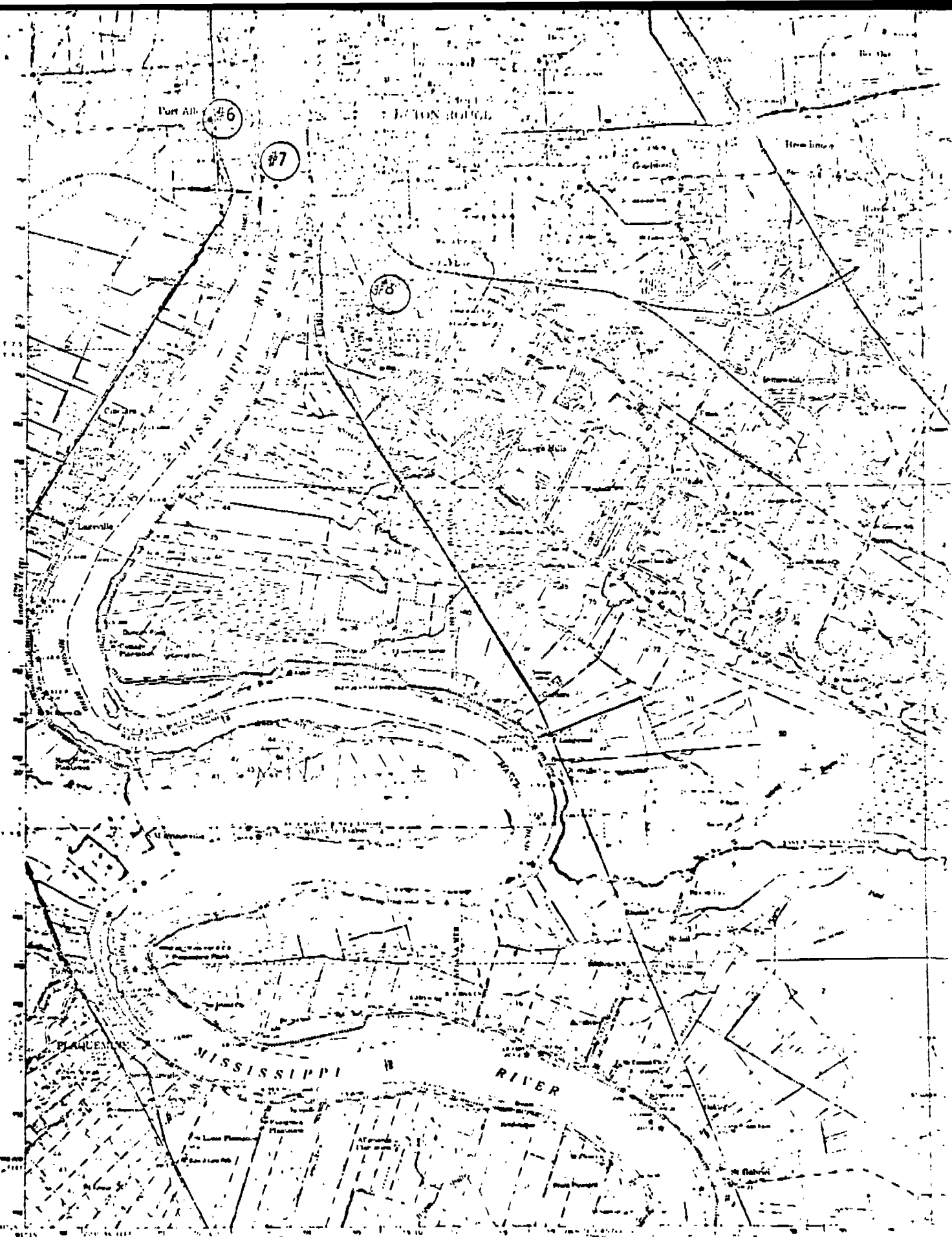
OVA Readout - 25 ppm H/C
OVA Column - 15 ppm VCl
Bomb Sample V - 50 ppb

No. 11 Airline Highway and North
Foster Drive intersection

OVA Readout - 30 ppm H/C
OVA Column - 15 ppm VCl
Bomb Sample - No vacuum left in bomb.

See attached maps.





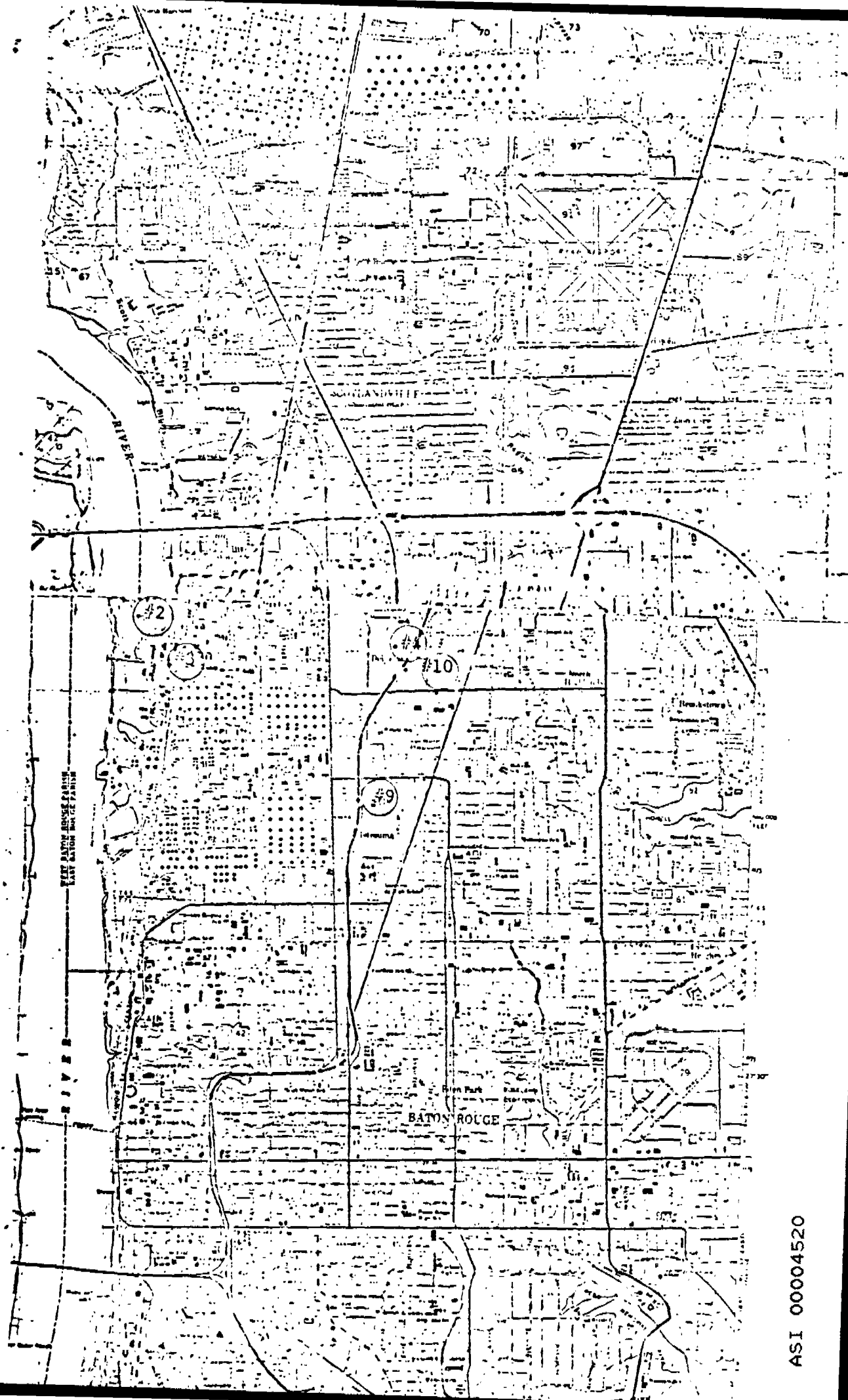
Prepared by the Mississippi River Commission
Published by the U.S. Army

Scale: 1 inch = 10 miles
N. 1/4 Sec. 36, T. 10 N., R. 10 E., S. 1 E.
Date: 1915
Sheet No. 1 of 1
Total No. of Sheets: 1
Total Area: 100 square miles
Area of this Sheet: 100 square miles
Area of other Sheets: 0 square miles
Total Area of Project: 100 square miles
Area of this Sheet: 100 square miles
Area of other Sheets: 0 square miles
Total Area of Project: 100 square miles

U.S. GOVERNMENT PRINTING OFFICE
1915

ASI 00004519

WATERWAY



ASI 00004520

Test No. 7 - Area Industry Testing (Works Vinyl plant down)

June 20, 1974

Time: 0910

Weather - Winds NNW at 5 mph, temperature 88°F

	<u>Sampling Points (Gas Collection bombs used)</u>	<u>ppb VC1</u>
No. 1	On railroad track at S.E. corner of property of GSU road	≤50
No. 2	On railroad track west end of Ethyl's lead building, 100 yards north of GSU road	<50
No. 3	On railroad track ~200 yards north of GSU road at drainage crossing	<50
No. 4	On railroad track ~300 yards north of GSU road	<50
No. 5	On railroad track ~400 yards north of GSU road	<50
No. 6	On railroad track ~500 yards north of GSU road	<50
No. 7	On railroad track by N.E. of property near Shada Avenue	<50

See attached maps.

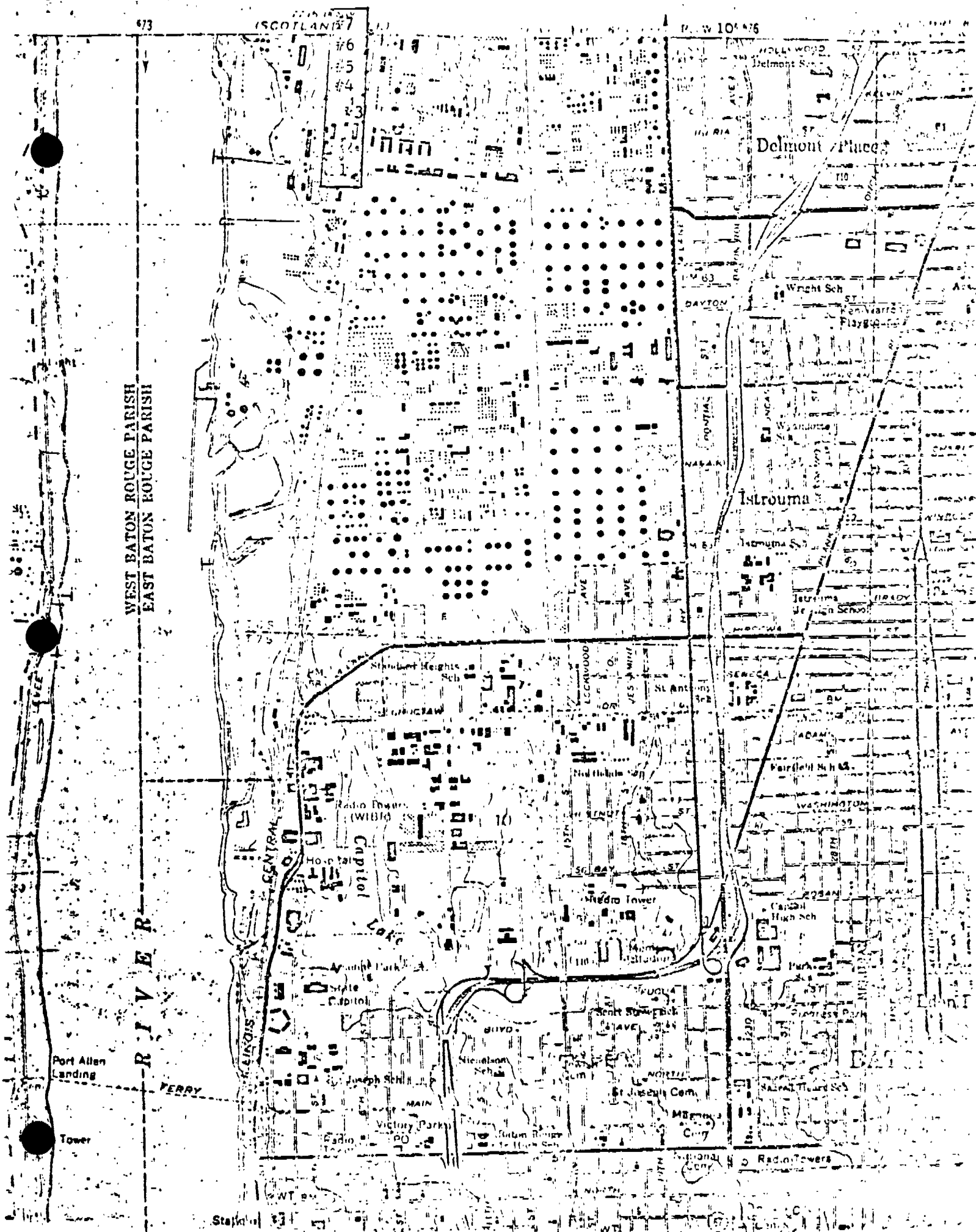
R.V.E.

Tower

FERRY

Station

ASI 00004523



Test No. 8 - Area Industry Testing (Works vinyl plant down)

June 20, 1974

Time: 1220

Weather- Winds ENE at 8-10 mph, temperature 87°F

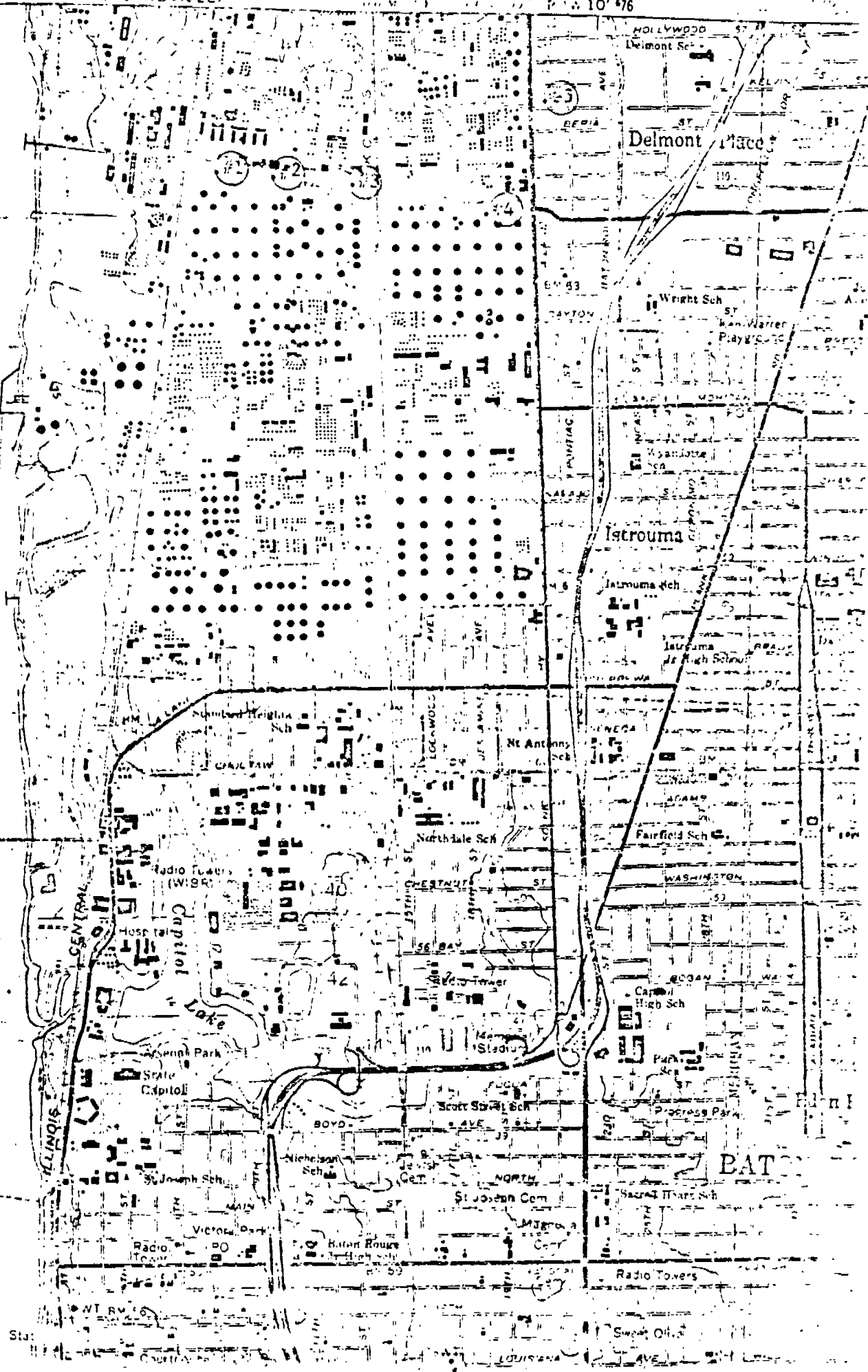
	<u>Sample Points (Gas collection bombs used)</u>	<u>ppb VC1</u>
No. 1	Ethyl parking lot near main gate No. 1	<50
No. 2	On GSU road in front of Ethyl's cooling tower	<50
No. 3	On GSU road in front of Ethyl Research lab	<50
No. 4	In front of Uniroyal's main gate	<50
No. 5	Across Scenic Highway from Exxon Chemical	<50
No. 6	On Shada Avenue west of bridge	<50
No. 7	On Shada Avenue north of Ethyl's spheres	<50

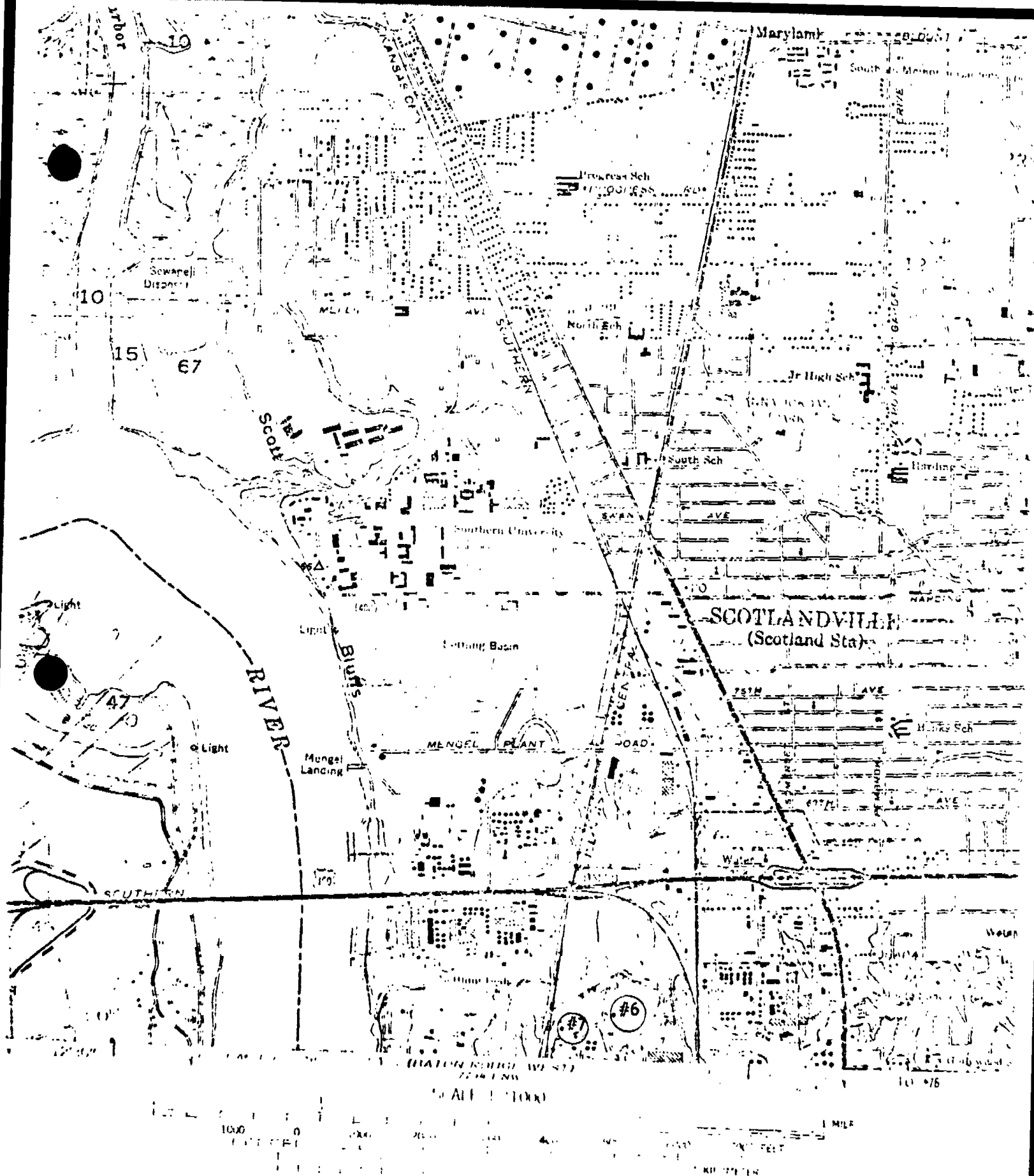
See attached maps.

WEST BATON ROUGE PARISH
EAST BATON ROUGE PARISH

RIVER

FERRY





ASI 00004526

FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225 OR WASHINGTON, D.C. 20242
 AND BY THE STATE OF LOUISIANA DEPARTMENT OF PUBLIC WORKS, BATON ROUGE, LOUISIANA 70803
 A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Test No. 9 - Balloon Testing

June 20, 1974

- No. 1 Middle parking lot NE corner of property. ≤50 ppb
There was .42 cu.ft. of air/sample taken for a
one hour period.
- No. 2 Sample taken in an open cracking furnace where men
were working. There was .42 cu. ft. of air /sample
taken for a one-hour period. ≤50 ppb VC1
- No. 3 Inside vinyl control room. A .42 cu.ft. of sample
was taken for ten minutes. ≤50 ppb VC1

Test No. 10

June 27, 1974

Twenty-five minute sample caught downwind of vinyl car loading
ramp in plastic bag.

5.4 ppm VCI

July 5, 1974

Ninety minute sample caught downwind of vinyl car loading.
Plastic bag contained 0.18 cu. ft. of air

15 ppm VCI

Test No. 11

June 27 - July 3, 1974

Vinyl production area marked off into 16 equal areas. A 25 plastic bag sample was taken in each area.

<u>Date</u>	<u>Grid No.</u>	<u>Results-ppm VC1</u>
6/28	1	Trace
	2	Trace
	3	Trace
	4	Trace
	5	Trace
7/1	6	Trace
	7	0.3
	8	0.5
7/2	9	Trace
	10	Trace
	11	0.15
	12	Trace
7/3	13	Trace
	14	Trace
	15	Trace
	16	Trace

Test No. 12 - Sample Room

July 1, 1974

July 3, 1974

Two tests were run inside of the block house that contains all of the sampling equipment for the on stream analyzers for the vinyl chloride plant. Plastic bag samples for 25 minutes were taken:

July 1, 1974

2.2 ppm VC1

July 3, 1974

1.9 ppm VC1

WEATHER DATA

Date		Wind Direction	Wind Speed MPH	Temperature °F
6/7/74	0900	S	12	87
6/7/74	1330	S	12	95
6/8/74	0900	S	20	86
6/8/74	1200	S	10-12	92
6/19/74	0915	W-NW	2	84-86
6/20/74	0910	N-NW	5	86
6/20/74	1220	E-NE	8-10	87
6/27/74	0930	N	8-10	74
6/28/74	0830	N-NW	5	80
7/1/74	0800	S-SW	6-8	85
7/2/74	0815	W-SW	2-4	85
7/3/74	0900	W-SW	2-4	84-92
7/5/74	0815	W-NW	0-2	80