

**PHASE II SAMPLING REPORT
FOR
DETROIT LEAD ASSESSMENT PROJECT
MICHIGAN SMELTING – 7885 JOSEPH CAMPAU STREET
DETROIT, WAYNE COUNTY, MICHIGAN**

Prepared for:

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDATION AND REDEVELOPMENT DIVISION**

Detroit Field Office – Cadillac Place
3058 West Grand Boulevard, Suite 2-300
Detroit, Michigan 48202

Prepared by:

WESTON SOLUTIONS OF MICHIGAN, INC.
2501 Jolly Road, Suite 100
Okemos, Michigan 48864

November 2005

W.O. No: 20083.028.001

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EXECUTIVE SUMMARY

Weston Solutions of Michigan, Inc. (WESTON®) was contracted by the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division to conduct off-site soil sampling for the Detroit Lead Assessment Project (the Site) in Detroit, Wayne County, MI. The Site consisted of evaluating off-site soil conditions near 10 facilities in the Detroit Metropolitan Area, that had been identified as potential lead smelters.

WESTON reviewed the available historical information and data from off-site samples from city and state owned properties near the former Michigan Smelting and determined that the facility was a possible former metals smelter, that residential areas were within potential aerial deposition zones, and that lead was detected downwind above the MDEQ Part 201 Residential Direct Contact Criteria.

Based on these conclusions, WESTON recommended collecting additional off-site soil samples from downwind properties in the affected neighborhood, performing inspections of the former facility including interviews with personnel, and collecting samples on the former facilities for lead analysis.

This summary report details the findings of the subsequent activities performed in the vicinity of the former Michigan Smelting. During the facility investigation and concurrent with the field sampling effort, WESTON and MDEQ found documentation that placed the former facility approximately 7000 feet from the neighborhood being assessed. Analytical results from the assessment indicate that lead is present in concentrations greater than the Michigan Department of Quality Part 201 Residential Criteria, but due to the distance from the potential source area and the lack of a spatial distribution this report concludes that the residences have not been affected by aerial deposition as a result of historical smelting operations

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SECTION 1

INTRODUCTION

Weston Solutions of Michigan, Inc. (WESTON®) was contracted by the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division to perform off-site sampling activities for the Detroit Lead Assessment Project (Former Michigan Smelting site) in Detroit, Wayne County, Michigan. This Phase II Summary Report presents a summary of the Phase II analytical results as well as a recommendation for future activities.

1.1 SITE LOCATION

The Former Michigan Smelting site was located at 7885 Joseph Campau Street, the Detroit Metropolitan Area, in Hamtramck, Wayne County, Michigan (**Figure 1-1**). The property now is occupied by the Hamtramck GM-Cadillac Assembly Plant (GM Assembly Plant) (**Figure 1-2**). The smelting facility has been demolished and replaced with a coal pile pad, a retention pond, and a grassy area located within the northwestern end of the existing GM Assembly Plant. The area immediately to the south of the property, is Interstate 94 with residential properties located south of the freeway and extending south for at least the next four blocks, including the existing GM Assembly Plant. The area immediately north of the property and extending five blocks north is industrial and then residential properties. The areas immediately east and west of the property are mostly industrial. Railroads run along the north and the west side of the property.

1.2 PREVIOUS WORK

To evaluate the potential for historical smelting activities to have occurred at the facilities, WESTON reviewed historical information from the Bresser's Directory Data, Sanborn Fire Insurance Maps and aerial photographs from various years, city fire marshal records, Baseline Environmental Assessments, and other available information. The results of this effort are summarized in the *Summary Report for Data Investigation, Detroit Lead Assessment Project*, prepared by WESTON, dated September 2003.

Following the historical data investigation, WESTON worked with MDEQ and the cities of Detroit and Hamtramck to identify city and state owned properties that were available to be sampled upwind and downwind of the suspected former smelting facilities. A minimum of 12 upwind and 12 downwind properties were sampled. The analytical results were reviewed to determine if spatial and statistically valid trends in concentrations of lead were present in the soils that would indicate the potential for aerial release of lead from smelting activities. The results of this effort are detailed in the *Comprehensive Phase I Summary Report for Detroit Lead Assessment Project* prepared by WESTON, dated March 2004.

WESTON concluded from the available historical information that the former facility was a possible metals smelter, residential areas are located within potential aerial deposition zones, and lead was detected on a site upwind above the MDEQ Part 201 Residential Direct Cleanup Criteria. Therefore, it was recommended that this facility be considered for further investigation.

During the Phase I investigation, WESTON collected samples from 12 upwind and 12 downwind properties. Review of the analytical results exhibited a trend of decreasing concentrations downwind of the former facility which indicated potential aerial deposition of lead from smelting operations had occurred. Recommendations from the Phase I effort included collecting additional off-site samples from downwind properties in the potentially affected neighborhoods, performing inspections at the former facilities and performing interviews with personnel, and collecting samples on the former facilities for lead analysis. The results of this effort are detailed in the *Comprehensive Phase I Summary Report for Detroit Lead Assessment Project* prepared by WESTON, dated March 2004.

1.3 BASIS OF CONCERN

Smelting operations often results in the release of airborne particulate matter to off-site locations. This particulate matter may be contaminated with smelting-related chemicals (primarily heavy metals), and deposition of these particles in soil may be of potential concern to human health.

The primary concern associated with the Michigan Smelting site is the off-site release of smelter-related metals, specifically lead, to soils in the surrounding neighborhood through aerial

deposition. The goal of the Phase II sampling was to determine if lead consistent with smelter-related releases are present off-site and can be attributed to the former facility.

SECTION 2

FIELD ACTIVITIES AND PROCEDURES

2.1 OVERVIEW OF SAMPLING ACTIVITIES

Experience with previous lead investigations indicated that if lead concentrations are present from aerial deposition, they would be found within a 1,000 feet (ft) to 1,500 ft radius of the source. Phase II soil samples were to be collected within approximately 1,000 ft downwind of the former facility; however, due to the development around the facility, samples could not be collected within the 1,000 ft radius per the Quality Assurance Sampling Plan (QASP) so the radius was increased.

After the initial screening, it was found that the lead levels in some samples exceeded the MDEQ's residential lead criteria. As a result of these findings, additional assessments were performed throughout the neighborhood around the area of the former smelter. WESTON mailed out access agreements to each resident located in the downwind direction of the suspected facilities. In addition, a door-to-door attempt was also made to gain access to the residential property. These efforts resulted in access to 34 of the 104 total downwind residences. Following receipt of access agreements, the properties were sampled following the sampling procedures outlined in the project QASP.

Each property sampled was divided into exposure units of approximately 500 square ft based on field inspection. Soil samples were collected at random locations within the exposure units. On vacant parcels where it was apparent that a house had previously existed, the exposure units consisted of an area in front of where the porch would have been located and an area in back of where the house would have been located. Houses on surrounding parcels were used to estimate where the house would have been. Samples were not collected within a 5-foot buffer from house drip lines, within a 5-foot buffer of any painted structure, or from locations where flaked paint or visibly stained soil existed. Greenways (right of ways, utility corridors, and alleyways) samples were collected from the furthest practicable point from the curb line. All samples from each

exposure unit were composited in the field and were analyzed for lead using United States Environmental Protection Agency (USEPA) Method 6010.

The WESTON sample team leader selected the random sample locations, collected samples, recorded the activities at each sample location using a site Personal Digital Assistant (PDA) and field logbook; and verified the sample documentation. Sample documentation and preparation was the responsibility of WESTON.

2.1.1 Sampling Approach

A total of 91 composite samples were collected from the 34 properties in the residential area downwind of the former smelter site and are shown on **Figure 1-3**.

Each composite soil sample consisted of approximately equal volumes from five randomly located discrete surface soil samples collected from 0 to 3 inches below ground surface. Each discrete soil sample was collected from an undisturbed area (i.e., no signs of recent landscaped areas, gardens, etc.). Soil samples were collected by removing a volume of soil approximately 3 inches in diameter and 3 inches in depth using a plastic scoop. The soil was placed directly into a large, plastic Ziploc® bag. Each exposure unit had its own dedicated scoop. Foreign material, such as vegetation, large rocks, and pebbles, etc., was removed from the sample and discarded. Following sample collection, the sample hole was filled with the remaining soil and grass was neatly placed back over the hole.

During sampling, all information regarding soil description, location, and other distinguishable features present at the sample site were recorded in the field logbook and samples were logged in the PDA. A field sketch was prepared (on 8.5-inch by 11-inch graph paper) for each exposure unit, which includes all sample locations and their sample number, physical features (sidewalks, building corners, utility poles), measurements between sample points and any information necessary to relocate the area (address, street name, etc.).

Soil samples were submitted to the laboratory for matrix spike/matrix spike duplicate (MS/MSD) analysis at a frequency of one per 20 soil samples. The sample team leader recorded the MS/MSD in the field logbook using the designation specified in the QASP.

2.1.2 Sampling and Sample Handling Procedures

Decontaminated sampling equipment and sample containers were maintained in a clean, segregated area prior to use. Sampling personnel changed gloves before collecting or handling each sample. All samples were assembled and catalogued prior to shipping to the MDEQ Environmental Laboratory in Lansing, Michigan. Sampling preservation, containers, and hold times for analytical methods associated with this site are described in **Subsection 2.1.4**. All information relating to sample collection (field notes, chain-of-custody, and sketches) was maintained as presented in **Section 2**.

2.1.3 Decontamination

All sampling equipment that was used was dedicated to each exposure unit, therefore decontamination was not required during this sampling event. Disposable scoops and gloves were placed into a garbage bag and properly disposed.

2.1.4 Sample Preservation, Containers, and Hold Times

After collection, the samples were securely stored in a cooler until they were submitted for analysis. The samples were transmitted to the MDEQ Laboratory in Lansing Michigan by a common carrier, typically every other day. Preservation of soil sample was not required, but rinsate blank samples were preserved with nitric acid and placed on ice.

2.2 FIELD ACTIVITIES

Field sampling was conducted by the following WESTON personnel; Ms. Lori Ash, Ms. Amanda Freeman, Mr. Ken McRowe, and Mr. Tony Noxon.

2.2.1 Sample Custody Procedures

Due to the evidentiary nature of sample collection, the possession of samples (chain-of-custody) must be traceable from the time the samples are collected until they are introduced as evidence in legal proceedings. Following sample collection and identification, the samples were maintained under chain-of-custody procedures, as described below.

The chain-of-custody procedures were made available to all personnel involved with the sampling. A typical chain-of-custody record was completed each time a sample or group of samples was prepared for shipment to the MDEQ laboratory. The record repeated the information on each of the sample labels and served as documentation of handling during shipment. A copy of this record remained with the shipped samples at all times, and another copy was retained by the member of the sampling team who originally relinquished the samples. WESTON personnel completed a chain-of-custody form for all samples sent to the MDEQ Environmental Laboratory.

2.2.2 Photo Documentation

WESTON took photographs to document site conditions, sample locations, and the exposure units as they related to adjacent areas. The photographs showed typical operations and operating conditions as well as special situations and conditions that arose during site activities.

All photographs were taken with a digital camera. Each photograph was recorded in the logbook, including with the location of the photographer, the direction the photograph was taken, the subject of the photograph, and its significance (i.e., why the picture was taken). Photographs were labeled using the automated assigned number the digital camera provides. The photograph location, direction, and subject were also shown on the site sketch.

SECTION 3

PHASE II ANALYTICAL RESULTS

3.1 SUMMARY OF ANALYSIS

During Phase II assessment, 91 composite soil samples were collected downwind from the project area. Sample locations from the downwind area are presented in **Table 3-1**.

In accordance with the QASP, a total of 91 samples were sent to the State laboratory for analysis via USEPA SW 6010 for total lead. Of the 91 samples collected, 21 of the samples contained concentrations of lead above the project screening level (400 mg/kg) established in the Phase I QASP.

3.2 ATMOSPHERIC CONDITIONS

During Phase II soil sampling activities, downwind parcels were chosen based on the mean wind direction from 1984 to 1991 for the Detroit metropolitan area. A copy of the wind rose plot is provided in **Appendix A**. The wind rose plot shows a prominent northeasterly wind direction to the northeast in the City of Detroit metropolitan area. If smelting operations occurred, lead in soils resulting from aerial deposition would be found downwind in the northeast direction from the suspected source area. No parcels were chosen for sample collection to the northeast of the former Michigan Smelting Site (downwind) due to lack of residential receptors within 3,600 ft. However, parcels ranging from 1,350 ft to 2,250 ft were chosen southeast, as close to the mean downwind direction of the suspected source area. During the performance of the field sampling, additional information became available due to on-site discussions that were held with the current property owners. This information indicates that the actual location of the former lead smelting activities at the Former Michigan Smelting Site was located over 7,000 ft north of the assessment area.

Elevated lead concentrations were found in the assessment area. A detailed analysis of downwind concentrations is contained in **Section 3.4**.

3.3 STATISTICAL ANALYSIS

Statistical analysis was not performed on this data set because the data was determined not to be representative of downwind concentrations of aerial deposition (**Section 3.4**)

3.4 SPATIAL ANALYSIS

Where air transport of materials occurs, it is expected that the largest impacts on the soil will occur closest to the source and the magnitude of the impact will tend to decrease as a function of distance from the source. In addition, it is expected that the spatial pattern of soil impacts will tend to be elongated in the predominant downwind direction. The Phase II investigation was designed to determine if an off-site airborne release has occurred by examining the spatial pattern of soil contaminant concentrations as a function of distance from the source in a downwind direction. As noted in **Section 3.2**, the data were collected from an area that is well outside of the expected aerial deposition envelope due to the revised location of the source area. As shown on **Figure 3-1**, concentrations of lead greater than the screening level occur within the area assessed. To determine the distribution of the lead concentrations in soils as the distance from the Michigan Smelting site increases, WESTON evaluated the lead concentration of samples versus the distance from the facility by graphing the data in relation to each other. As seen on **Figure 3-1**, concentrations of lead greater than the screening level occur within the assessed area; however, no statistical trend exists for the data that indicates a decreasing concentration of lead as distance increases from the initially suspected source.

SECTION 4

CONCLUSION

4.1 CONCLUSION

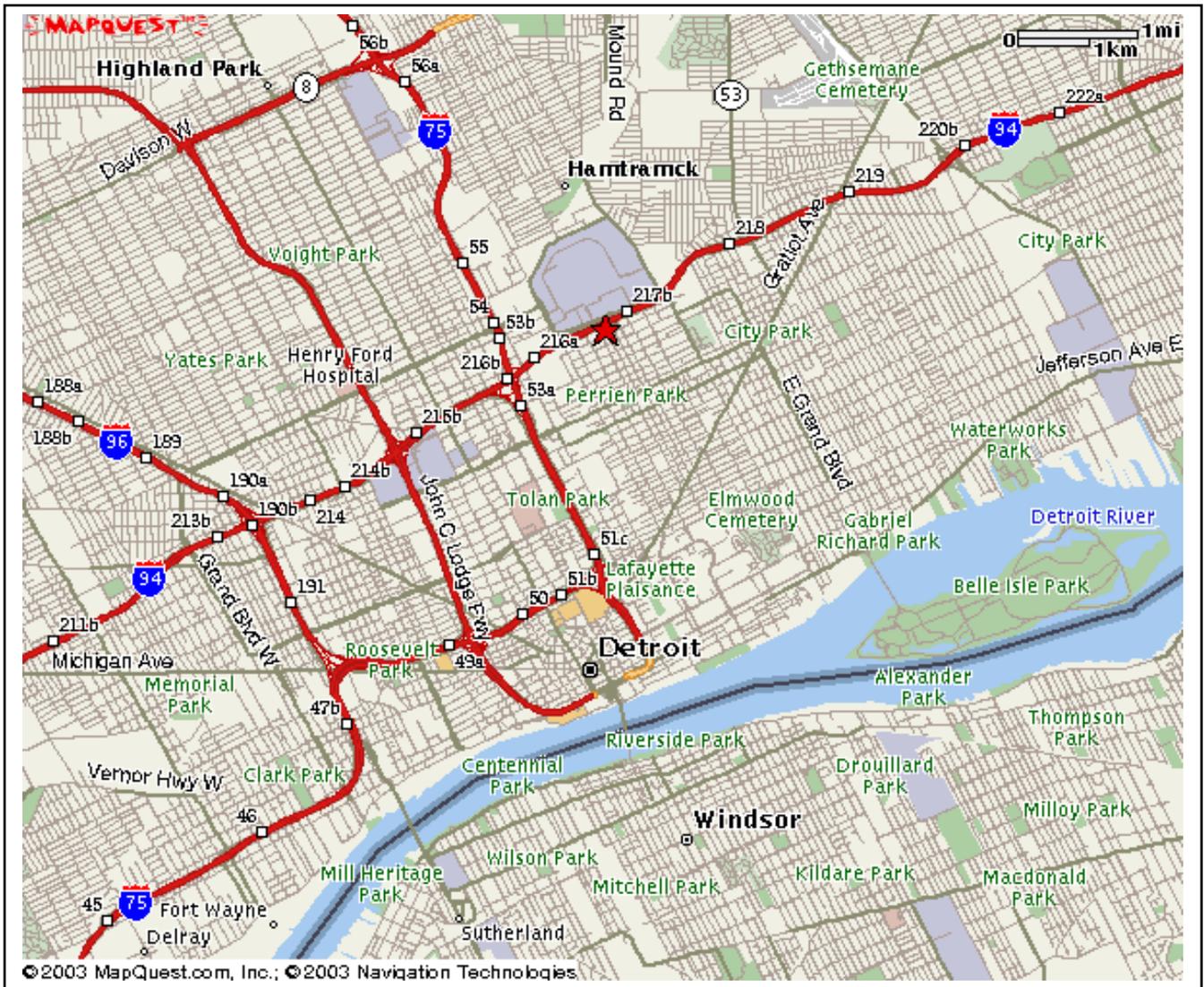
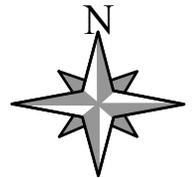
Review of the available historical information and the current analytical data indicate that the area assessed during the Phase II investigation has not been affected by aerial deposition of lead contamination. The revised location of the Former Michigan Smelting site and the lack of a spatial trend in decreasing concentration versus distance support this conclusion. The contamination found during the Phase II investigation for the Former Michigan Smelting Site property is likely the result of other sources of lead commonly found in urban environments (e.g. lead paint).

In addition, the areas north and east of the revised location of the smelter are primarily industrial with residential areas well outside the expected area of influence (1,600 ft downwind of a suspected source).

APPENDIX A

FIGURES

FIGURE 1
Site Location Map
7885 Joseph Campau Street

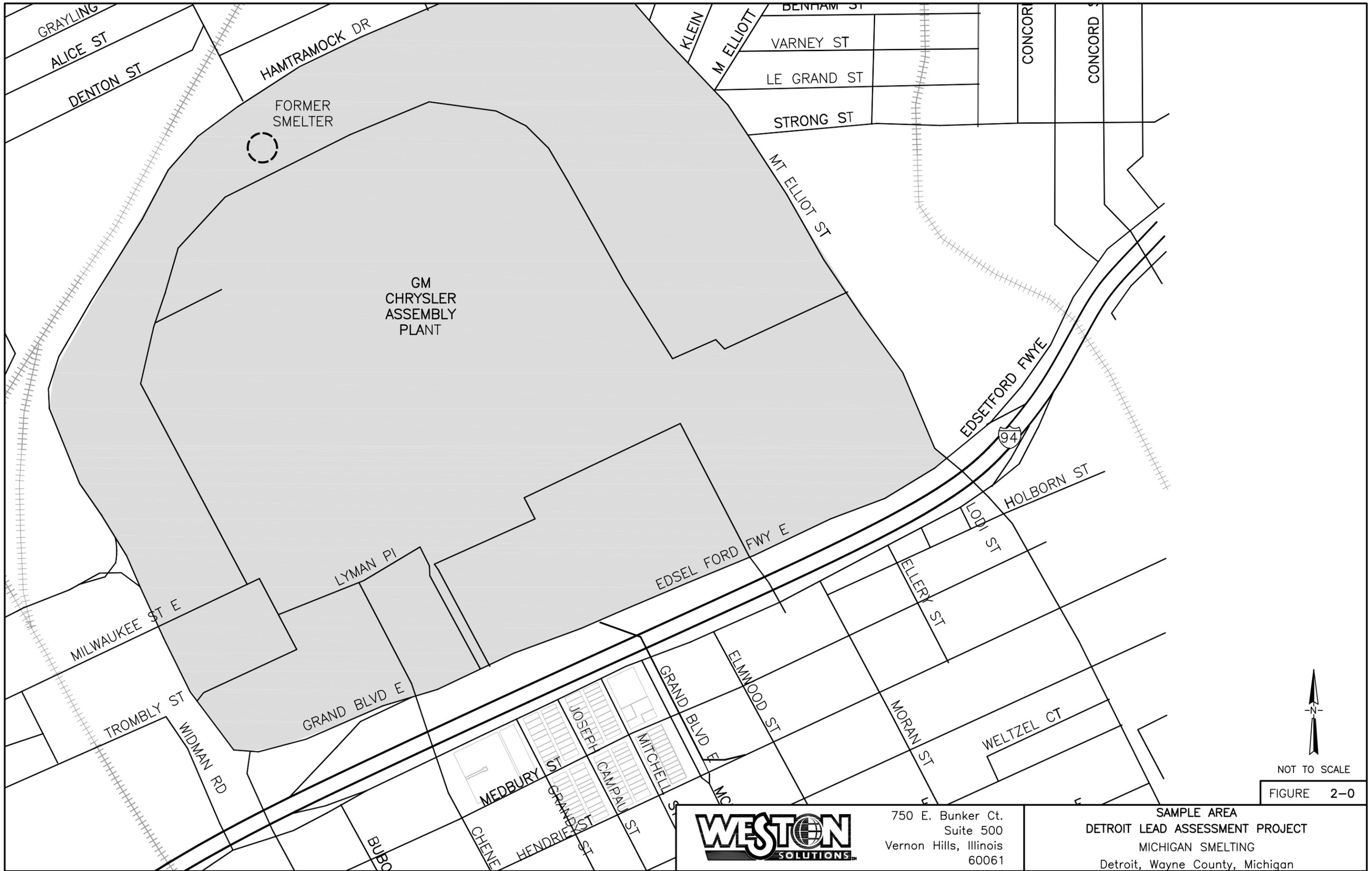


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Detroit Lead Assessment Project
Detroit, Wayne County, Michigan
W.O. No. 20083.028.001



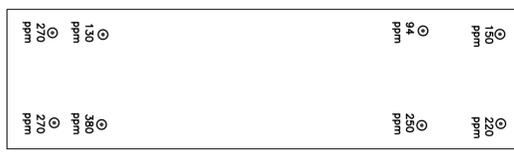
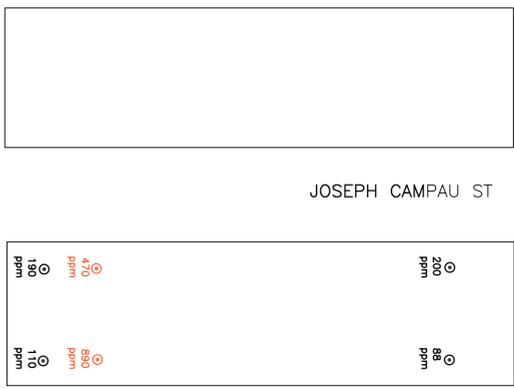
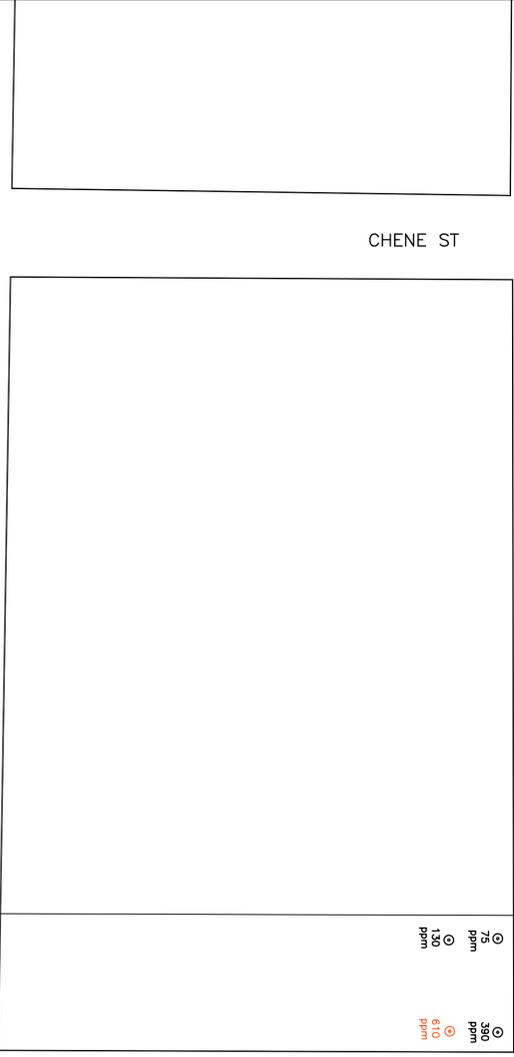
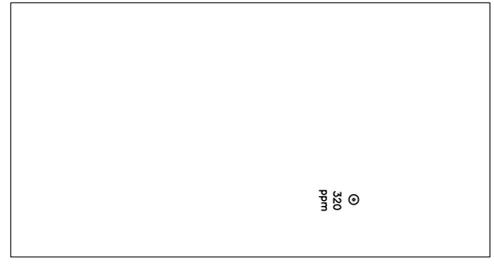
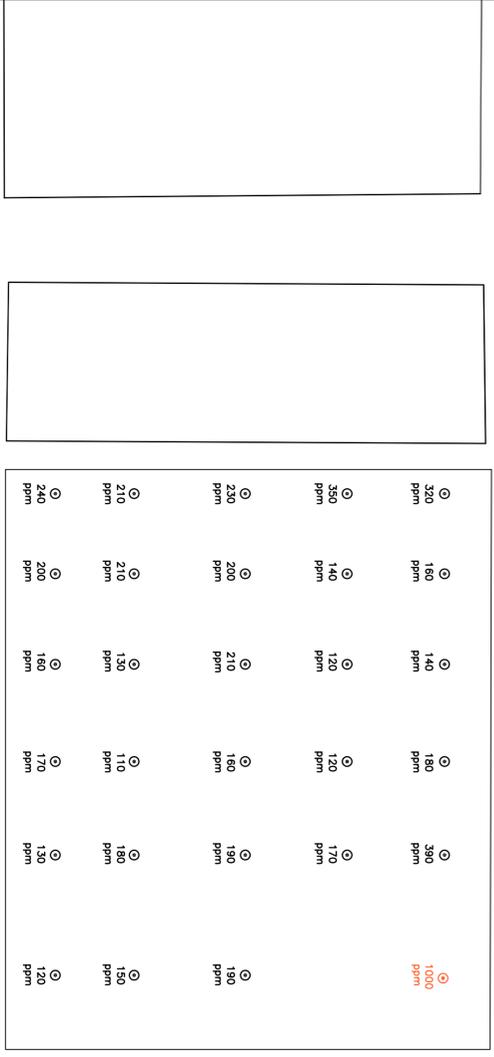
NOT TO SCALE

FIGURE 2-0



750 E. Bunker Ct.
 Suite 500
 Vernon Hills, Illinois
 60061

SAMPLE AREA
 DETROIT LEAD ASSESSMENT PROJECT
 MICHIGAN SMELTING
 Detroit, Wayne County, Michigan

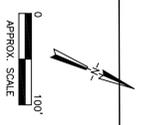


LEGEND

- 360 ppm ● PHASE I SAMPLE LOCATION BELOW 400 PPM
- 460 ppm ● PHASE I SAMPLE LOCATION ABOVE 400 PPM
- 380 ppm ○ PHASE II SAMPLE LOCATION BELOW 400 PPM
- 460 ppm ○ PHASE II SAMPLE LOCATION ABOVE 400 PPM



750 E. Bunker Ct.
Suite 500
Vernon Hills, Illinois
60061



SAMPLE LOCATION MAP
DETROIT LEAD ASSESSMENT PROJECT
MICHIGAN SMELTING
Detroit, Wayne County, Michigan

SCALE: ~1"=100'
DRAWN: D.C.H.
DATE: 8/04
DWG. NO: 14304
FIGURE 3-0

APPENDIX B

TABLES

Table 3-1
Summary of Analytical Results
Investigative Samples
Michigan Smelting
Detroit, Michigan

SAMPLE NO	DATE	TIME	RESULTS (PPM)
1-1	06/09/04	8:35	350
1-2	06/09/04	8:45	600
2-1	06/09/04	8:00	370
2-2	06/09/04	8:10	420
3-1	06/09/04	9:10	320
4-1	06/14/04	12:15	310
4-2	06/14/04	12:25	510
5-1	06/14/04	12:40	130
5-2	06/14/04	12:50	270
6-1	06/14/04	13:00	430
6-2	06/14/04	13:10	140
7-1	06/14/04	1:25	350
7-2	06/14/04	13:35	280
8-1	06/14/04	11:10	610
8-2	06/14/04	11:20	130
9-1	06/14/04	10:50	390
9-2	06/14/04	11:00	75
10-1	06/14/04	10:40	2300
11-1	06/14/04	10:15	300
11-2	06/14/04	10:25	160
12-1	06/14/04	9:55	400
12-2	06/14/04	10:05	630
13-1	06/14/04	9:30	380
14-1	06/14/04	9:40	110
14-2	06/11/04	10:20	1000
14-3	06/11/04	15:40	160
14-4	06/11/04	10:45	390
14-5	06/11/04	15:50	200
14-6	06/11/04	11:05	180
14-7	06/11/04	16:00	240
14-8	06/11/04	11:20	140
14-9	06/11/04	11:35	160
14-10	06/11/04	11:50	320
14-11	06/11/04	12:00	350

Table 3-1
Summary of Analytical Results
Investigative Samples
Michigan Smelting
Detroit, Michigan

SAMPLE NO	DATE	TIME	RESULTS (PPM)
14-12	06/11/04	12:01	140
14-13	06/11/04	12:05	120
14-14	06/11/04	12:10	120
14-15	06/11/04	12:20	170
14-16	06/11/04	13:10	190
14-17	06/11/04	13:20	190
14-18	06/11/04	13:30	160
14-19	06/11/04	13:40	210
14-20	06/11/04	13:50	200
14-21	06/11/04	14:00	230
14-22	06/11/04	14:10	210
14-23	06/11/04	14:20	210
14-24	06/11/04	14:30	130
14-25	06/11/04	14:40	110
14-26	06/11/04	14:50	180
14-27	06/11/04	15:00	150
14-28	06/11/04	15:10	120
15-1	06/11/04	15:20	130
15-2	06/11/04	15:30	170
16-1	06/14/04	9:10	360
16-2	06/14/04	9:20	120
17-1	06/14/04	8:50	470
17-3	06/14/04	9:00	200
18-1	06/09/04	14:10	190
18-2	06/09/04	14:20	110
19-1	06/09/04	13:45	470
19-2	06/09/04	13:55	890
20-1	06/10/04	10:30	200
20-2	06/10/04	10:35	88
21-0	06/10/04	14:05	80
21-2	06/10/04	14:15	180
22-1	06/10/04	13:20	390
22-2	06/10/04	13:30	420
23-1	06/10/04	13:40	380

Table 3-1
Summary of Analytical Results
Investigative Samples
Michigan Smelting
Detroit, Michigan

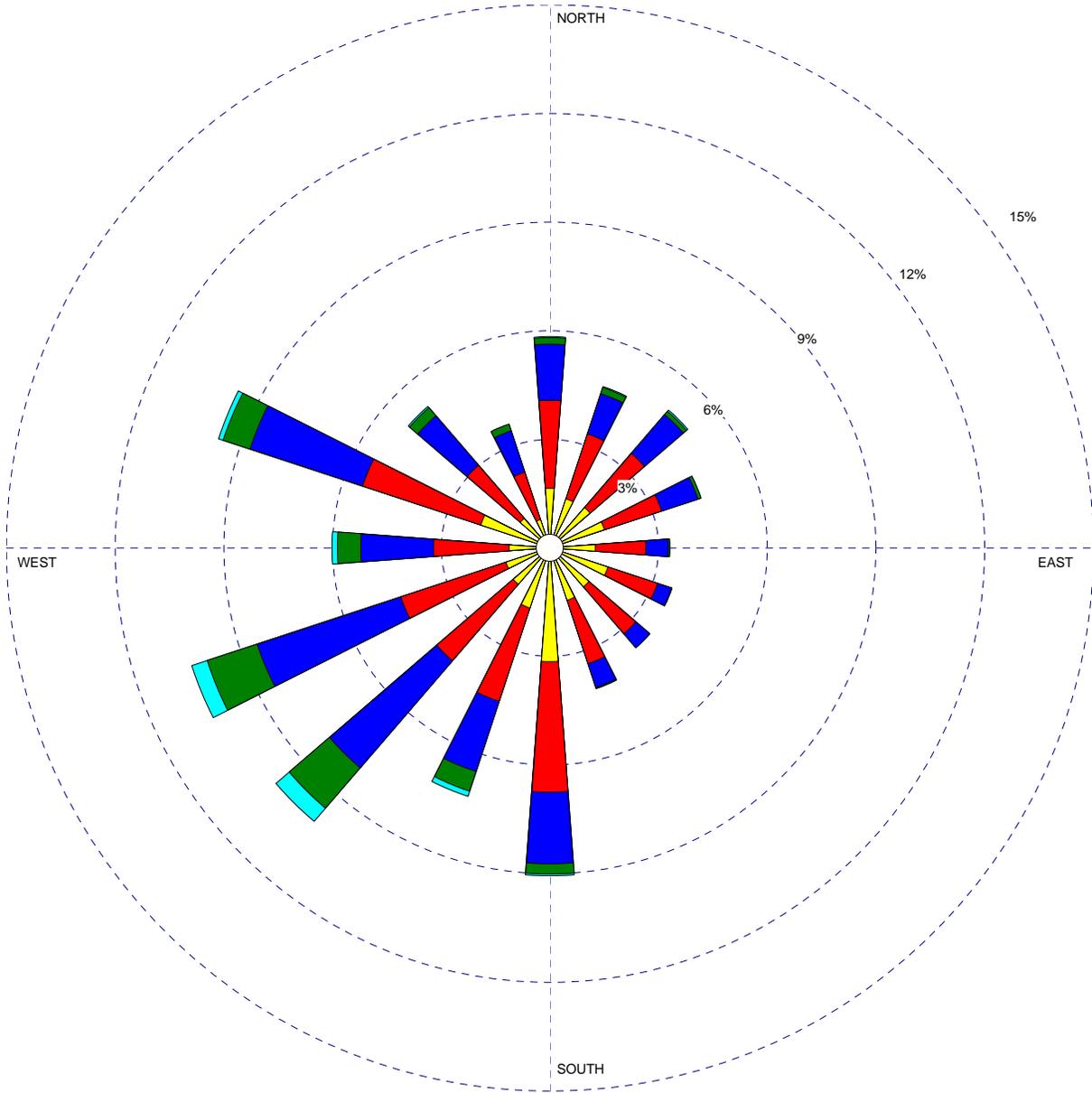
SAMPLE NO	DATE	TIME	RESULTS (PPM)
23-2	06/10/04	13:50	890
24-1	06/10/04	12:55	320
24-2	06/10/04	13:05	440
25-1	06/10/04	12:30	420
25-2	06/10/04	12:40	390
26-1	06/09/04	9:45	270
26-2	06/09/04	9:55	270
27-1	06/09/04	10:05	380
27-2	06/09/04	10:15	130
28-1	06/09/04	10:25	250
28-2	06/09/04	10:35	94
29-1	06/09/04	10:45	220
29-2	06/09/04	10:55	150
30-1	06/09/04	12:05	680
30-2	06/09/04	12:20	390
31-1	06/10/04	10:10	970
31-2	06/10/04	10:20	57
32-1	06/10/04	9:35	520
32-2	06/10/04	9:45	200
33-1	06/10/04	9:15	320
33-2	06/10/04	9:25	400
34-1	06/10/04	8:45	490
34-2	06/10/04	8:55	340

APPENDIX C

WIND ROSE PLOT

WIND ROSE PLOT

STATION #94847 - DETROIT/METROPOLITAN ARPT, MI



<p>Wind Speed (m/s)</p>		DATE	2/3/2003	Weston Solutions, Inc.	
	DISPLAY	Wind Speed	UNIT		m/s
	AVG. WIND SPEED	5.06 m/s	CALM WINDS	3.67%	
	ORIENTATION	Direction (blowing from)	PLOT YEAR-DATE-TIME	84 85 86 87 88 89 90 91 January 1 - December 31 Midnight - 11 PM	ATTACHMENT C