PHASE I SUMMARY REPORT
FOR
DETROIT LEAD ASSESSMENT PROJECT
DETROIT LEAD PIPE WORKS – 7001 LYNDON STREET
DETROIT, WAYNE COUNTY, MICHIGAN

Prepared for:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDIATION AND REDEVELOPMENT DIVISION
Detroit Field Office – Cadillac Place
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3058 West Grand Boulevard
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Prepared by:

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March 2004

W.O. No. 20083.028.001

EXECUTIVE SUMMARY

Weston Solutions of Michigan, Inc. (WESTON®) was contracted by the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division (RRD) to conduct off-site sampling for the Detroit Lead Assessment Project (the Project) in Detroit, Wayne County, Michigan. This Summary Report addresses sampling that was conducted in the vicinity of the former Detroit Lead Pipe Works (the Facility), 7001 Lyndon Street, Detroit, Wayne County, Michigan.

The presence of lead identified on properties adjacent to or nearby the Facility, was evaluated against predominant atmospheric conditions, spatial distribution, and statistical analysis to determine if the lead at adjacent or nearby properties was indicative of aerial deposition from the Facility.

On 13 November and 4 December 2003, WESTON collected 24 soil samples for lead analysis at locations upwind and downwind of the Facility. The data collected during the Phase I sampling does not support that an identifiable release occurred from the Facility during historic smelting operations. Because lead concentrations exceeding the screening level were detected downwind and downwind sampling locations were located near the edge of the downwind envelope, it is recommended that additional work be performed at the Facility including:

- Obtain access to the Facility for:
    - ° Review of existing information related to property transfer (Phase I, Phase II, and development planning):
    - ° Interview past employees regarding historical Facility operations;
    - ° Perform a Facility walk through to determine existing conditions;
    - ° Collect on-site soil samples to determine the presence, concentration, and extent of lead on the Facility (related to the location of former structures, if possible); and
- Collect soil samples from additional downwind properties to confirm and/or determine the extent of downwind contamination.

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LIST OF ATTACHMENTS

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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 (RRD) to conduct off-site sampling for the Detroit Lead Assessment Project (the Project) in Detroit, Wayne County, Michigan. This Summary Report addresses sampling that was conducted in the vicinity of the former Detroit Lead Pipe Works (the Facility), 7001 Lyndon Street, Detroit, Wayne County, Michigan. The overall objectives, technical basis, and general sampling protocols for this work are described in the *Comprehensive Phase I Sampling Summary Report for the Detroit Lead Assessment Project* (Comprehensive Summary).

This Phase I Summary Report for Detroit Lead Pipe Works has been organized in a format that is intended to facilitate and effectively meet the objectives of the Phase I investigation. The Summary Report is organized into the following sections:

- **Section 1** – Introduction,
- **Section 2** – Site Information,
- **Section 3** – Field Activities and Procedures,
- **Section 4** – Phase I Analytical Results, and
- **Section 5** – Recommendations.

Attachments to this Summary Report include the following:

- **Attachment A** – Figures,
- **Attachment B** – Tables,
- **Attachment C** – Wind Rose Plot,
- **Attachment D** – Photographs of Sampling Locations,
- **Attachment E** – Concentration Graph,
- **Attachment F –** Statistical Distribution.

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SECTION 2

SITE INFORMATION

2.1 SITE DESCRIPTION

The Facility, located at 7001 Lyndon Street in Detroit, Wayne County Michigan (Detroit Metropolitan Area), was suspected of historical smelting operations and was chosen for investigation by the MDEQ based on its presence on a nationwide list of potential lead smelters. WESTON performed a preliminary records review including review of Bresser's city directory information, Sanborn fire insurance maps, aerial photographs, Fire Marshall inspection/permit records, and Baseline Environmental Assessments (BEAs). This review, presented in the *"Summary Report for Data Investigation, Detroit Lead Assessment Project"* dated September 2003, concluded that the Facility required additional investigation. Facility location maps are included in **Attachment A**. The addresses of off-site properties sampled are presented in **Table 1** located in **Attachment B**.

2.1.1 Site Location

The Facility appears to be a building in good condition. Detroit Lead Pipe Works is engraved into a cement sign on the front of the building with the year 1941. A fence extends from the east and west sides of the building around the back and encloses the property. The area five blocks north of the Facility is residential. The areas five blocks south and west of the Facility are industrial. The area five blocks east of the Facility is a combination of industrial and commercial.

2.1.2 Site History

Review of the Bresser's city directory indicated that Detroit Lead Pipe Works owned the property from 1946 to 1996. Co-owners of this property included: AAA Lead Shielding, AAA Notch Bar Lead, AAA Sheet Lead Company, and AAA Solder Company from 1981 to 1996. There was no listing for the present address in 2003.

Review of the Sanborn maps for this address showed that from 1950 through 2002, Detroit Lead Pipe Works, Inc. is present with steel truss concrete foundation and a lead furnace.

The aerial photograph review indicated this address was industrialized from 1957 to the present with heavy residential area beginning 300 feet (ft.) to the north. Structures identified from the most recent aerial photograph (2003 GlobeXplorer™) include a larger building in the center of the property with several smaller structures to the east. Review of the drive by information indicates that land use is consistent with the aerial photograph and Sanborn maps.

During the investigation of the fire records, an inspection report was located stating that this was a lead cutting plant.

Review of the BEA for nearby "7401 Lyndon Street", dated September 1999, prepared by Clayton Environmental for the XYX-Detroit Inc., indicates that lead was detected at levels between 3.0 to 14 milligrams/kilogram (mg/kg) and did not exceed the MDEQ Part 201 Residential Direct Contact Criteria (RDCC) (400 mg/kg).

2.2 SITE CONCERNS

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

SECTION 3

FIELD ACTIVITIES AND PROCEDURES

3.1 OVERVIEW OF SAMPLING ACTIVITIES

The goal of the Phase I sampling was to determine if lead concentrations consistent with smelter related releases were present off-site and could be attributed to the Facility. The general sampling protocol presented in **Section 2** of the Comprehensive Summary was followed during the Phase I evaluation of the Facility. Due to the development around the Facility, samples could not be collected within the 1,000 foot radius stated in the Quality Assurance Sampling Plan (QASP), so the radius was increased for this Facility.

Prior to sample collection, upwind and downwind sampling areas were established, 2,550 and 1,800 ft. from the Facility, respectively. These areas were established based on mean wind direction from 1984 to 1991 for the Detroit Metropolitan Area. A copy of the wind rose plot is provided in **Attachment C.** Soil samples were collected from City and/or State owned properties located within these established areas.

The City and/or State owned parcels identified for sampling were those closest to the average wind direction and at varying distances from the Facility. Where individual City and/or State owned parcels were not available, rights-of-way, utility corridors, and alleyways ('greenways') were used and have been identified on the figures included in **Attachment A**. Photographs of the sampling locations have been included in **Attachment D**. Exposure units and appropriate sample grids were established in accordance with the QASP to guide the sampling activities.

Sampling activities (sample collection, record keeping, photo documentation) were conducted as described in the Comprehensive Summary. WESTON collected samples from 10 City and/or State owned parcels and two greenways near the Facility. Four City and/or State owned parcels and two greenways were sampled in the downwind direction, and six City and/or State owned parcels were sampled in the upwind direction due to size and availability of the properties. Two composite samples were collected from each of the four downwind parcels and two greenways, and all six of the upwind parcels. Twenty four composite samples were collected from the area

upwind and downwind of the Facility and are shown on the sample sketches included in **Attachment A**.

3.2 FIELD ACTIVITIES

WESTON personnel conducted field sampling on 13 November and 4 December 2003. Since 12 City and/or State owned parcels were not available, WESTON selected two greenways, prior to the sampling event, and submitted them to the City of Detroit to obtain their approval and access. Any changes to field sample identifications were noted in the logbook and can be viewed on the "Summary Table For Sample Properties" (**Attachment B**) and the sample sketches (**Attachment A**).

WESTON collected two samples from each of the six upwind City and/or State owned parcels for a total of 12 upwind samples. Also, two samples were collected from each of the four City and/or State owned parcels and two downwind greenways for a total of 12 downwind samples. Twenty four soil samples were submitted for analysis. Five samples were designated as matrix spike/matrix spike duplicates (MS/MSD) in accordance with the QASP.

SECTION 4
PHASE I ANALYTICAL RESULTS

4.1 SUMMARY OF ANALYSIS

During Phase I soil sampling the following samples were collected from the Facility project area:

- 12 composite soil samples in the upwind direction, and
- 12 composite soil samples in the downwind direction.

Sample locations from both the upwind and downwind areas are listed in **Table 1** included in **Attachment B**.

In accordance with the QASP, a total of 24 samples were sent to the State Laboratory located in Lansing, Michigan for analysis by United States Environmental Protection Agency (U.S. EPA) Method 6010B for lead. Samples collected from properties upwind of the Facility did not contain concentrations of lead above the project screening level (400 mg/kg) established in the Phase I QASP. One sample collected from properties downwind of the Facility contained concentrations of lead above the project screening level (400 mg/kg) established in the Phase I QASP. A summary of the Phase I sample results is included in the table below.

Phase I Summary of Results

Location	Number of Samples	Number equal or greater than 400 mg/kg	Range of Values (mg/kg)
Upwind	12	0	43-170
Downwind	12	1	40-490
Total	24	1	40-490

4.2 ATMOSPHERIC CONDITIONS

During Phase I soil sampling activities, upwind and downwind parcels were selected 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 **Attachment C**. The wind rose plot showed a prominent northeast wind direction in the City of Detroit Metropolitan Area. If smelting operations occurred, lead in soils resulting from aerial deposition would be detected downwind in the northeast direction from the Facility. Parcels ranging from 2,290 ft. to 2,550 ft. were selected southwest in the upwind direction of the Facility. Parcels ranging from 1,050 ft. to 1,800 ft. were chosen northeast, as close to the mean downwind direction of the Facility due to the presence of residential properties. A single elevated lead concentration was detected in the downwind direction of the Facility and low level lead concentrations were detected in the upwind direction. A detailed analysis of upwind and downwind concentrations is contained in **Section 4.3 Spatial Analysis**.

4.2 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. Thus, the Phase I investigation was designed to determine if an off-site airborne release had occurred by examining the spatial pattern of soil contaminant concentrations as a function of distance from the Facility in a downwind direction. As seen in **Figure 2 (Attachment A)**, concentrations of lead greater than the screening level occurs within the primary downwind envelope.

To determine the distribution of the lead concentrations in soils as the distance from the Facility increases, WESTON evaluated the lead concentration of samples versus the distance from the Facility by graphing the data in relation to each other. Evaluation of this graph (see **Attachment E**) indicated consistently low concentrations of lead in the upwind direction and slightly elevated levels of lead in the downwind direction. The graph does not represent decreasing concentrations with increasing distance from the Facility. This condition would be expected if an aerial release of lead had occurred due to smelting operations. These conclusions were confirmed by a linear regression of the concentrations versus distance data (**Attachment E**).

4.3 STATISTICAL ANALYSIS

Analytical data was entered into a spreadsheet and differentiated as downwind and upwind samples, then processed using the MDEQ online statistical interface for Part 201 evaluations. As shown on the distribution analysis figures included in **Attachment F** the downwind logmean is 5.1 mg/kg and the upwind logmean is 4.3 mg/kg indicating the concentrations downwind are greater than the upwind concentrations. In addition the relative frequency histogram (**Attachment F**) for the upwind data shows a larger variation across a smaller concentration range than the downwind data. Comparison of the upwind and downwind data sets indicates the lead concentrations are sufficiently different from each other both in mean concentration and distribution to conclude that the data represent separate conditions.

4.4 CONCLUSIONS

The pattern of analytical results for lead in soil samples collected for the Facility does not suggest that lead contamination detected in downwind locations is attributable to historic releases from historic smelting operations at the Facility. The analytical data was compared to a screening level consisting of the MDEQ Residential and Commercial I Direct Contact Criteria for soils (400 mg/kg), as established under Part 201 Environmental Response of the Natural Resources and Environmental Protection Act 1994, as amended.

Samples collected from upwind of the Facility did not contain concentrations of lead above the screening level and the lead that is present is similar in concentration to detected in the far downwind direction, which could be indicative of background concentration. Additionally, the downwind samples do not show a trend of decreasing concentration with increasing distance. The data collected during the Phase I sampling did not suggest that an aerial release occurred from the site during historic smelting operations. However, sample locations were located near the edge of the downwind envelope creating a data gap in the downwind results.

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SECTION 5

RECOMMENDATIONS

The results of this investigation do not indicate that soils at downwind properties have been impacted by releases of lead from the Facility as a result of aerial deposition related to historic smelting operations. Because lead concentrations exceeding the screening level were detected downwind and downwind sampling locations were located near the edge of the downwind envelope, it is recommended that additional work be performed at the Facility including:

- Obtain access to the suspected source Facility for:
    - ° Review of existing information related to property transfer (Phase I, Phase II, and development planning):
    - ° Interview past employees regarding historical Facility operations;
    - ° Perform a Facility walk through to determine existing conditions;
    - ° Collect on-site soil samples to determine the presence, concentration, and extent of lead on the Facility (related to the location of former structures, if possible); and
- Collect soil samples from additional downwind properties to confirm and/or determine the extent of downwind contamination.

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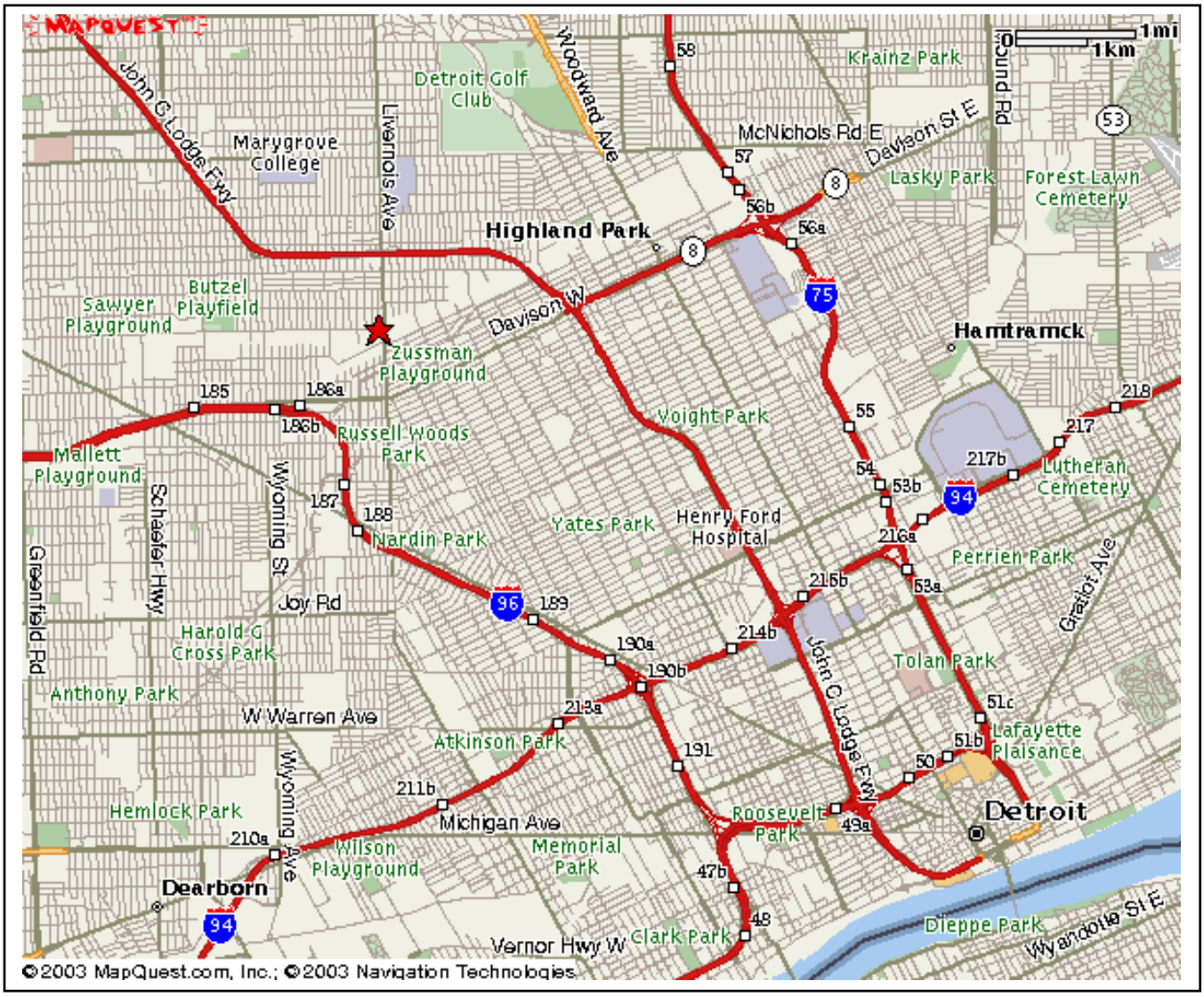
ATTACHMENT A

FIGURES

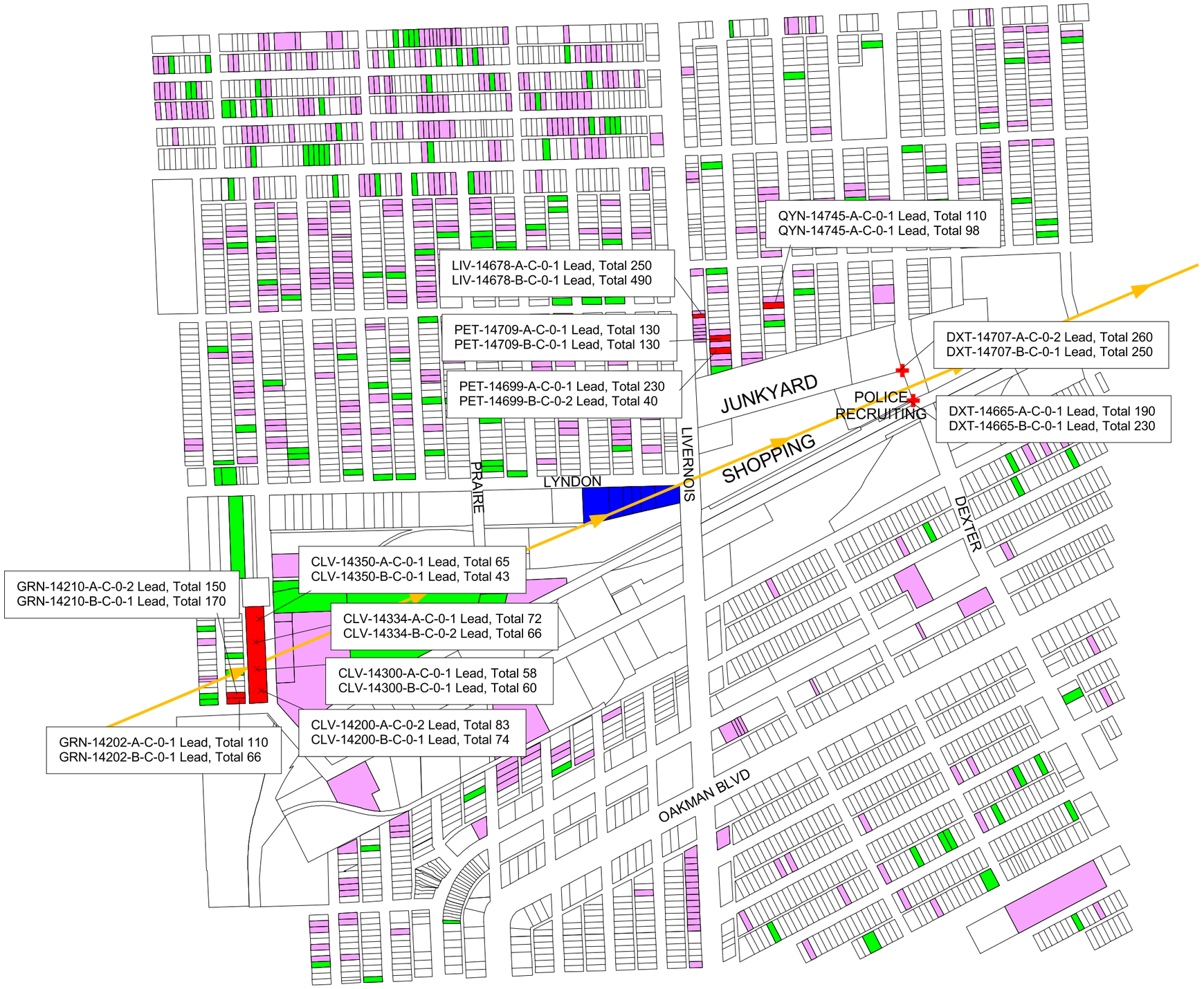
FIGURE 1
Site Location Map
7001 Lyndon Street



WESTON SOLUTIONS, INC. OF MICHIGAN

300 River Place, Suite 2800
Detroit, Michigan 48207

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



LEGEND:

EXAMPLE:

MWK-02525-A-C-0-1 Lead, Total 170

Sample ID | Constituent | Result

- Sampled Properties (Greenway)
- Parcel Boundaries
- Sampled Properties
- Facility of Concern
- State Owned Property
- City Owned Property
- Wind Direction

Note: All Lead, Total analytical results are shown in mg/kg.

N

0 600 Feet

WESTON SOLUTIONS SM

PROJECT NAME:

Detroit Lead Assessment Project
Detroit, Wayne County, Michigan

Weston Soultions, Inc. of Michigan
300 River Place
Suite 2800
Detroit, Michigan 48207

DRAWING TITLE:

Detroit Lead Pipe Works
7001 Lyndon Street

WORK ORDER No.:	20083.028.001	PROJECT MANAGER:	
DRAWN BY:	JLT	CHECKED BY:	
DRAWING NAME:		DIRECTORY/ FOLDER:	JLT://D:\DLAP\apr\09_09_03.apr
CONTRACT No.:		DELIVERY ORDER No.:	
SCALE:		REPORT DATE:	
DATE:	January 2004	REVISION No.:	FIGURE No.: 2

WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT LYNDON W.O. NO. ____

TASK DESCRIPTION CLV- 14350AB ; 14334 A-B ; 14300AB; 14300 A-B TASK NO. ____

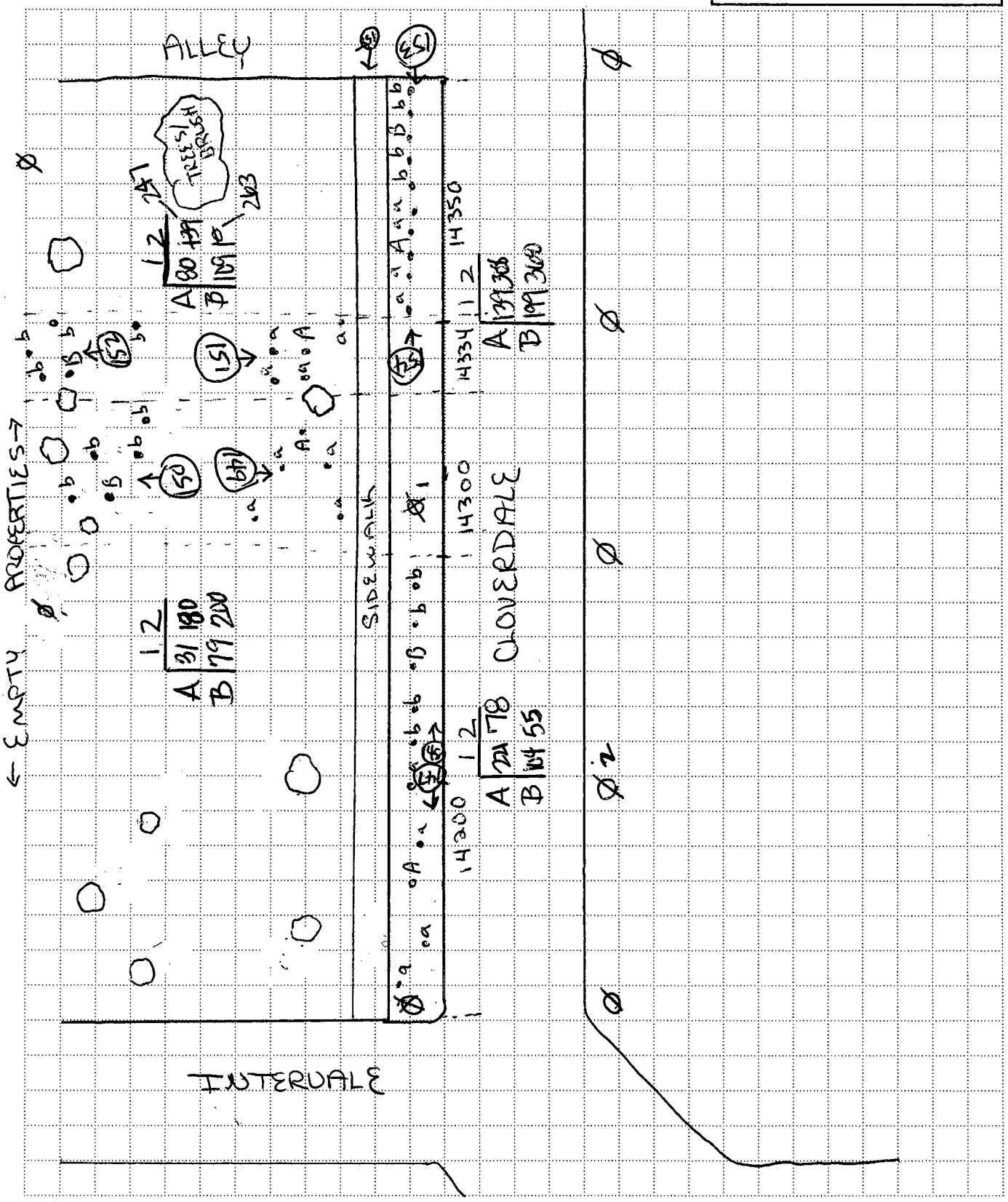
PREPARED BY A. Freeman DEPT ____ DATE 12/4/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Lyndon W.O. NO. ____

TASK DESCRIPTION 14202 + 14210 Greenlawn A+B TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

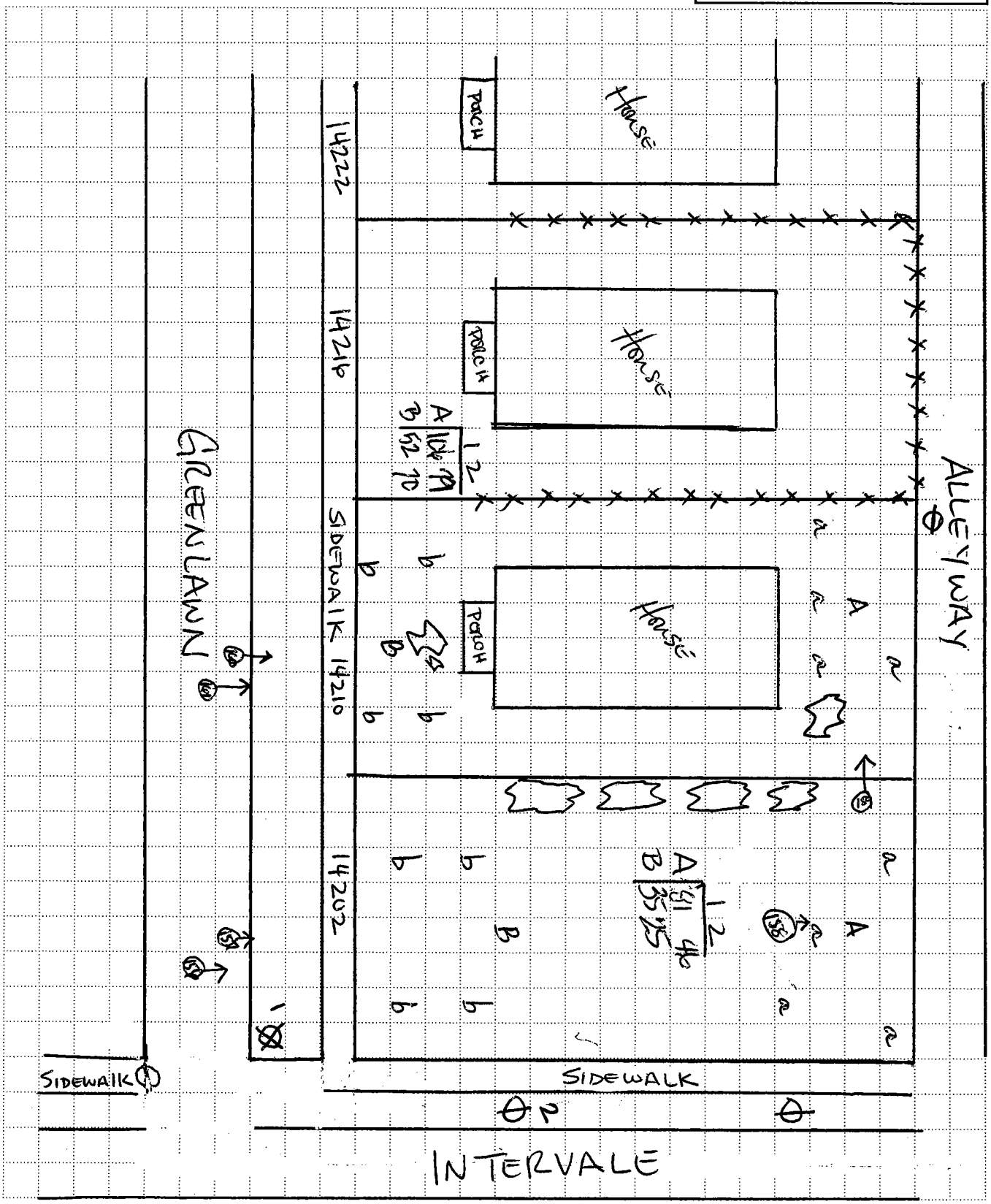
MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____

DEPT ____ DATE ____

N



RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Lyndon W.O. NO. ____

TASK DESCRIPTION DXT-14665 A+B TASK NO. ____

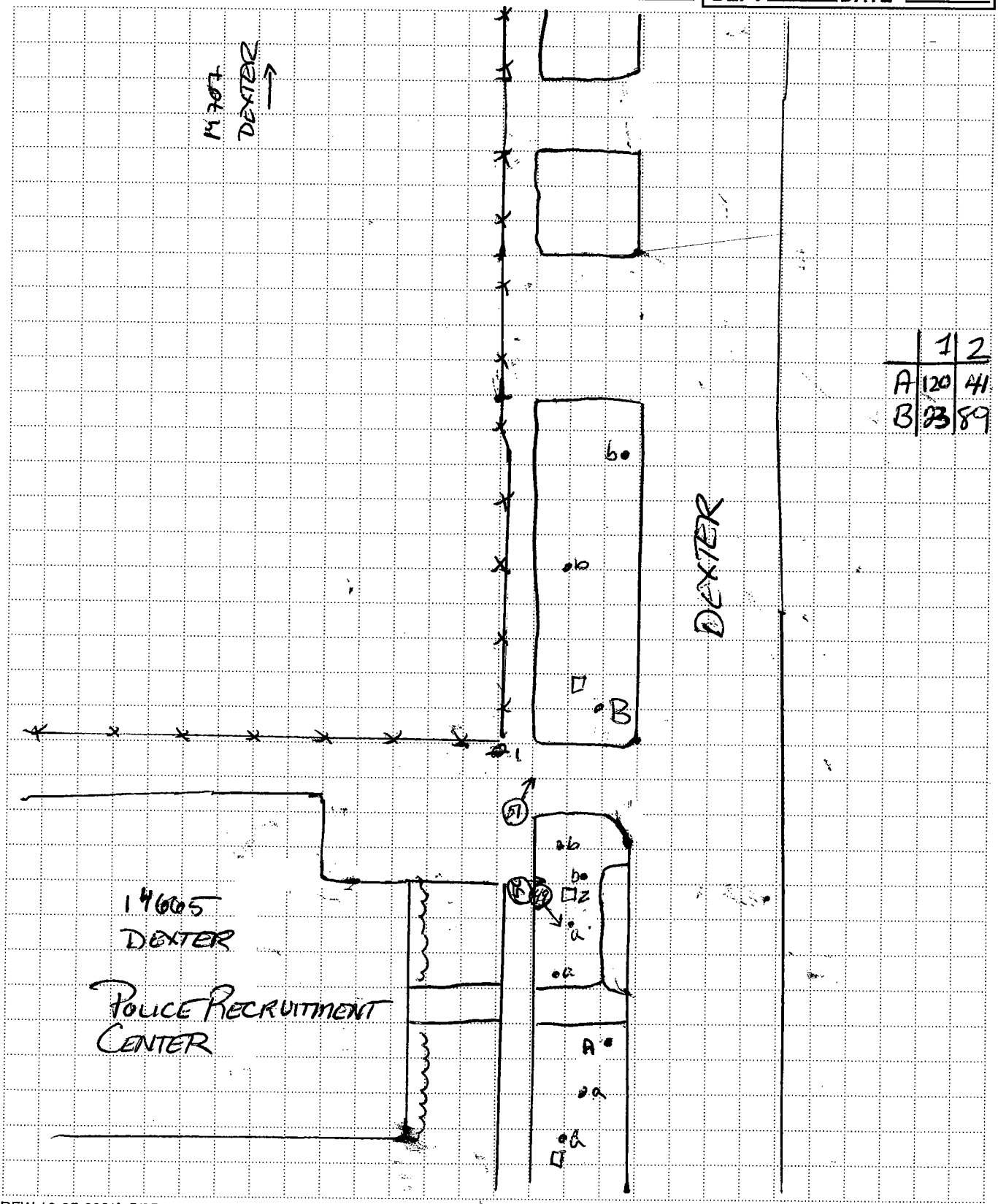
PREPARED BY R. Nemirovsky DEPT ____ DATE 11/13/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



	1	2
A	120	41
B	23	89

WESTON® MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT LYNDON W.O. NO. ____

TASK DESCRIPTION ~~14605~~ AND 14707 DEXTER A+B TASK NO. ____

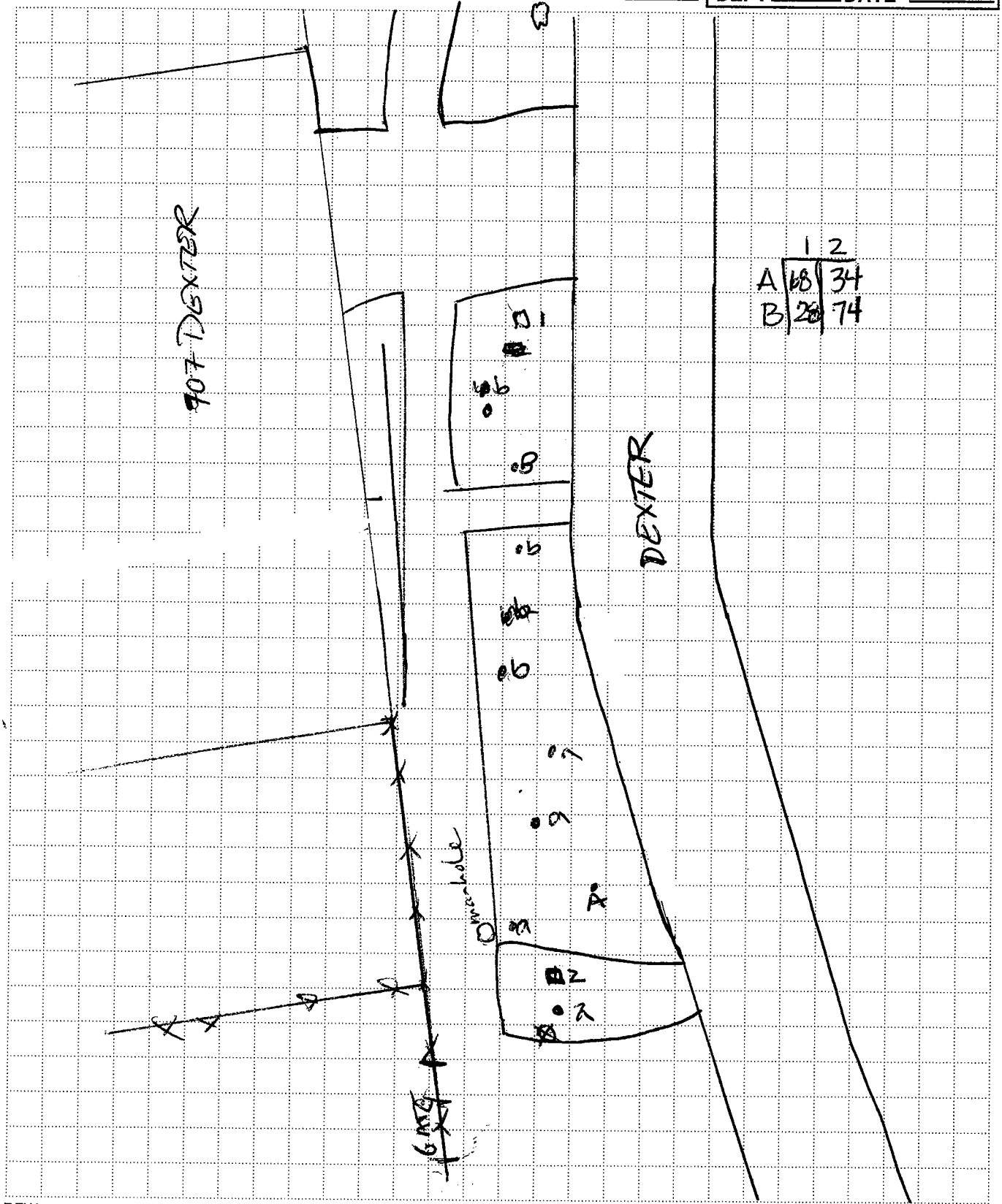
PREPARED BY R. NEMIROVSKY DEPT ____ DATE 11/13/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____

DEPT ____ DATE ____



RFW 10-05-003/A-5/85

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SHEET ____ of ____

CLIENT/SUBJECT LYNDON W.O. NO. ____

TASK DESCRIPTION PET-14699 A+B AND PET-14709 A+B TASK NO. ____

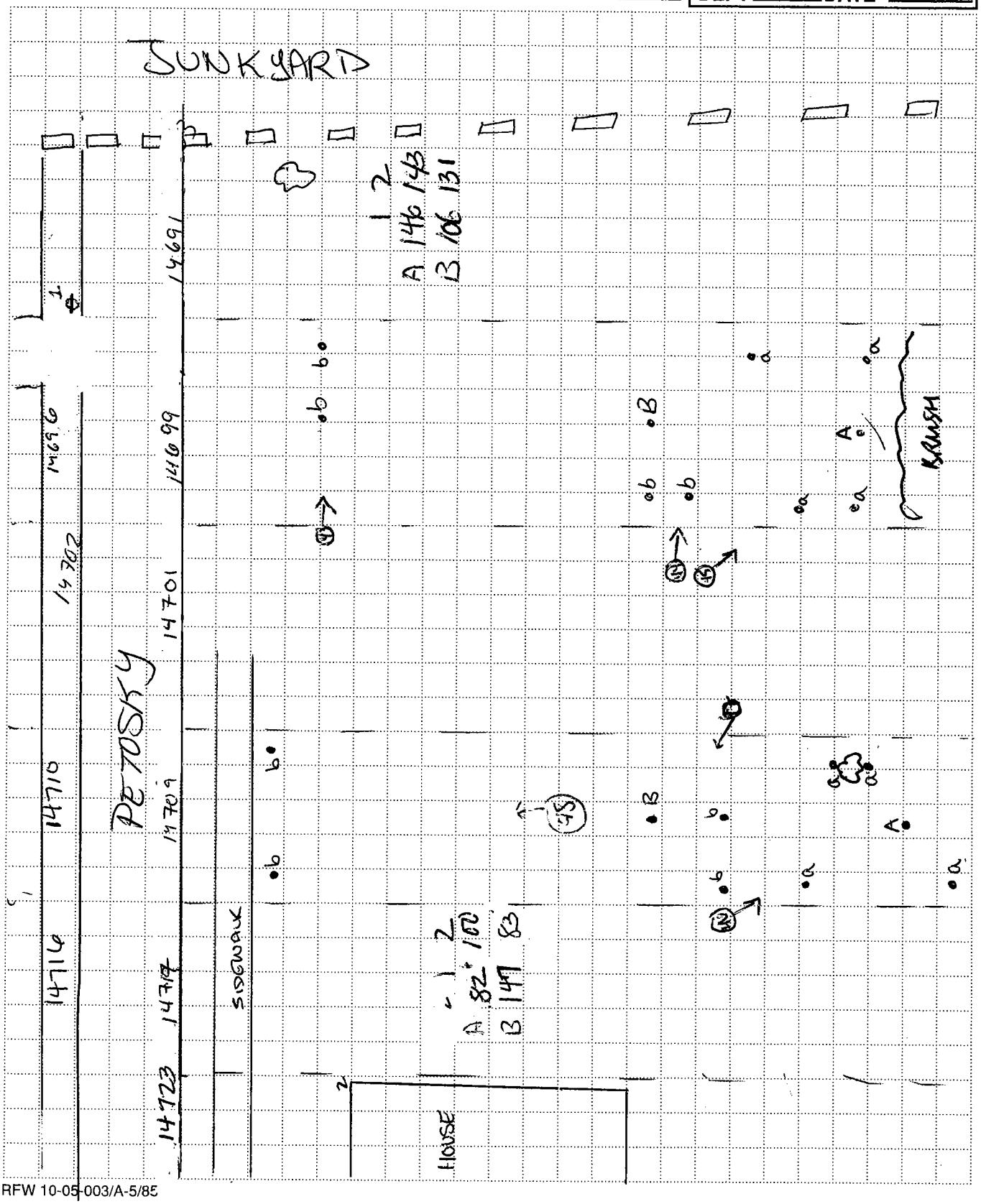
PREPARED BY R.NEMROVSKY DEPT ____ DATE 1/13/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



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WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT LYNDON W.O. NO. ____

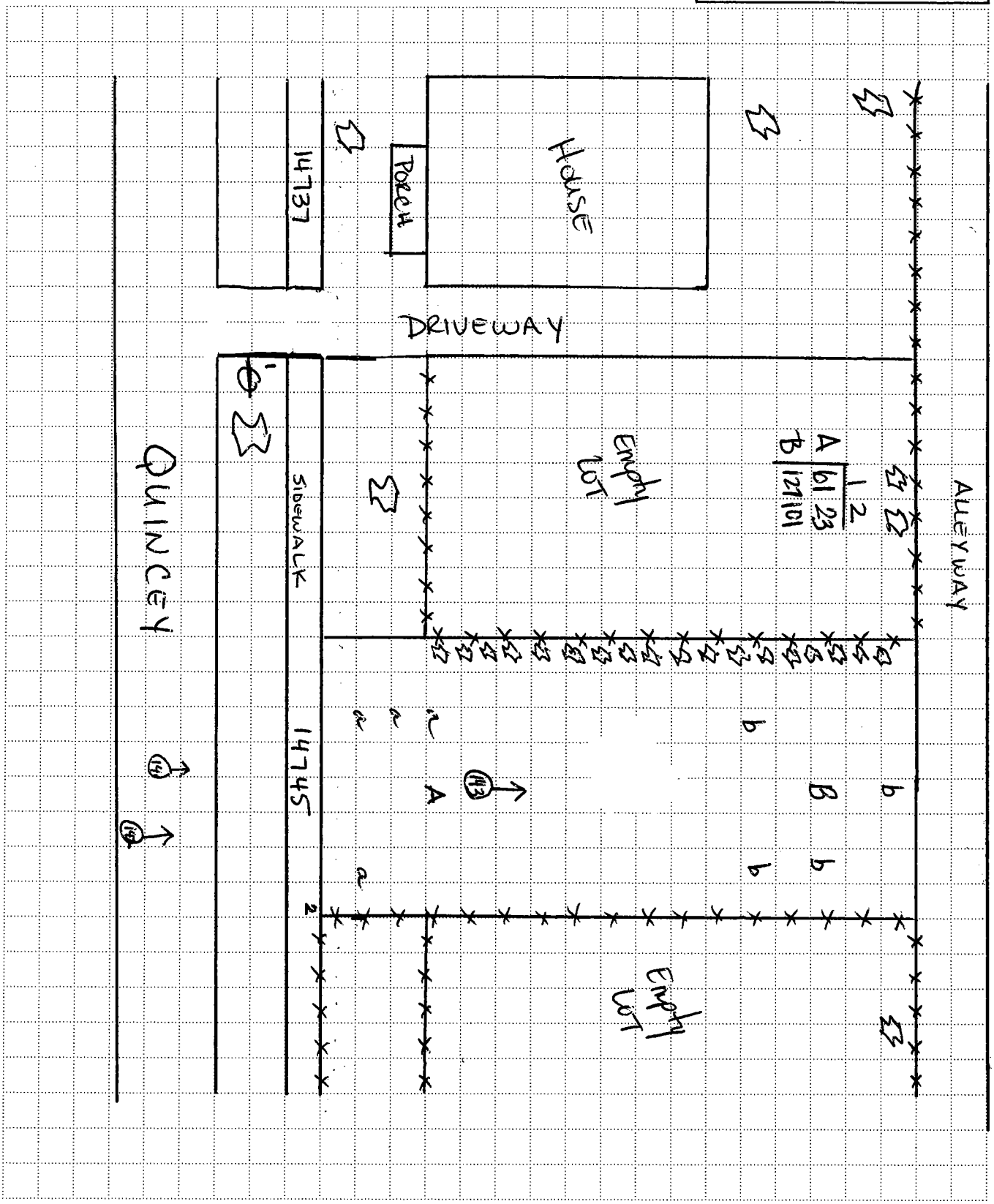
TASK DESCRIPTION QNY-14745-A+B TASK NO. ____

PREPARED BY S. Lewis DEPT ____ DATE 12/4/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



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WESTON® MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT LYNDON W.O. NO. ____

TASK DESCRIPTION LIV-14678 AMB TASK NO. ____

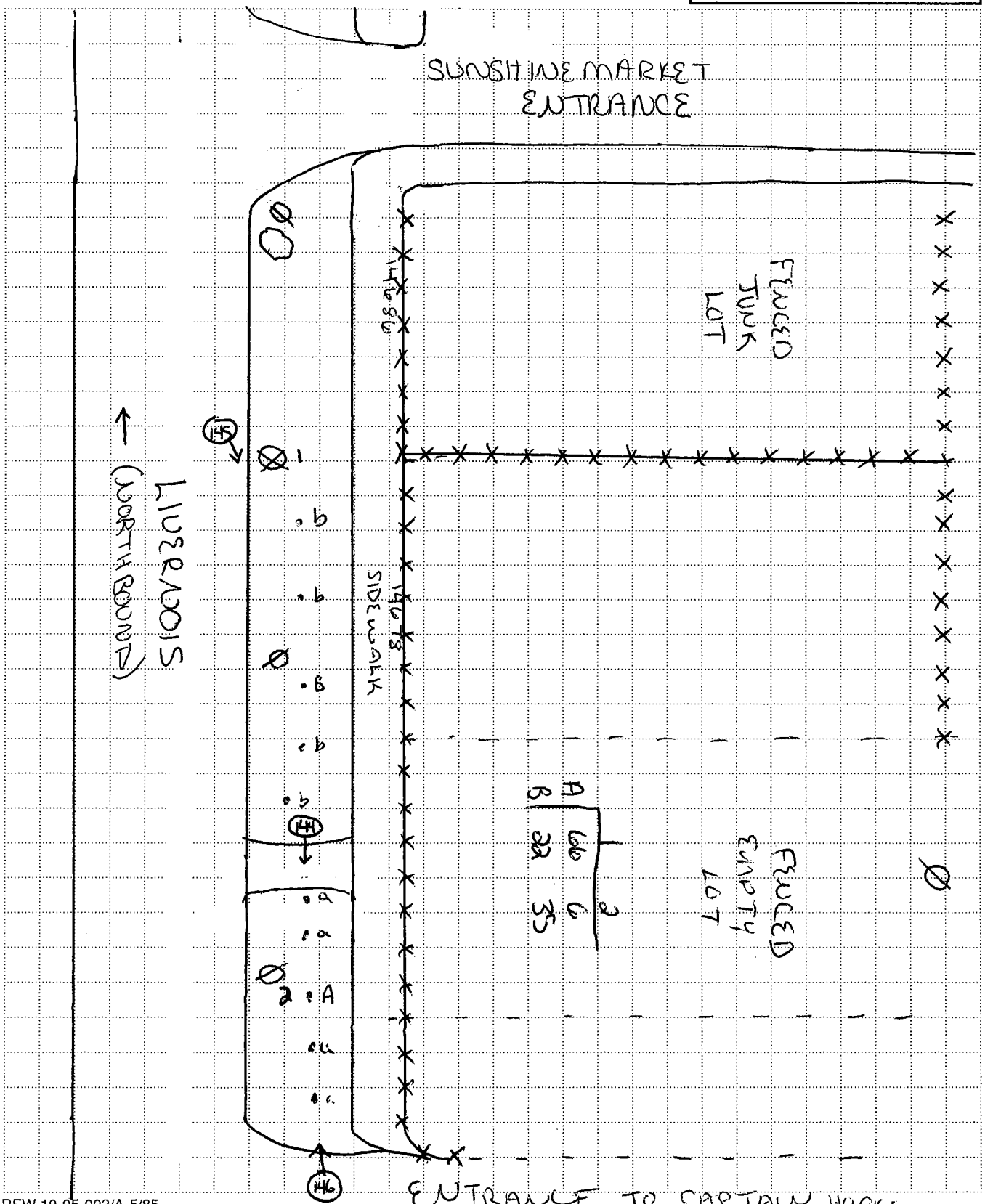
PREPARED BY A Freeman DEPT ____ DATE 12/4/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____



ATTACHMENT B

TABLES

TABLE 1

SUMMARY OF SAMPLED PROPERTIES

Upwind Properties		
Address	**Description**	**Sample Identification**
14205 Cloverdale*	Vacant property on the west side of Cloverdale St. Greenway used on corner of Cloverdale and Intervale.	CLV-14200-A-C-0-2
		CLV-14200-B-C-0-1
14205 Cloverdale*	Vacant property on the west side of Cloverdale St. Lot used.	CLV-14300-A-C-0-1
		CLV-14300-B-C-0-1
14205 Cloverdale*	Vacant property on the west side of Cloverdale St. Lot used.	CLV-14334-A-C-0-1
		CLV-14334-B-C-0-2
14205 Cloverdale*	Vacant property on the west side of Cloverdale St. Greenway used on corner of Cloverdale and an alley.	CLV-14350-A-C-0-1
		CLV-14350-B-C-0-1
14202 Greenlawn	Vacant property on the east side of Greenlawn St at the Corner of Greenlawn and Intervale.	GRN-14202-A-C-0-1
		GRN-14202-B-C-0-1
14210 Greenlawn	House located on the east side of Greenlawn St. Front and Back yard used for sampling.	GRN-14210-A-C-0-2
		GRN-14210-B-C-0-1
Downwind Properties		
Address	**Description**	**Sample Identification**
14665 Dexter	Greenway located on the west side of Dexter St and to the east of a Police Recruitment Center.	DXT-14665-A-C-0-1
		DXT-14665-B-C-0-1
14707 Dexter	Greenway located on the west side of Dexter St and to the east of a fenced in lot.	DXT-14707-A-C-0-2
		DXT-14707-B-C-0-1
14699 Petosky	Vacant property located on the east side of Petosky St and the fourth vacant lot to the north of a house at 14723 Petosky.	PET-14699-A-C-0-1
		PET-14699-B-C-0-2
14709 Petosky	Vacant property located on the east side of Petosky St and the second vacant lot to the north of a house at 14723 Petosky.	PET-14709-A-C-0-1
		PET-14709-B-C-0-1
14745 Quincey	Vacant property located on the west side of Quincey St and between two fenced vacant lots.	QYN-14745-A-C-0-1
		QYN-14745-A-C-0-1
14678 Livernois	Greenway located on the east side of Livernois St and to the west of fenced in lot containing Captain Hooks Used Auto Parts Building.	LIV-14678-A-C-0-1
		LIV-14678-B-C-0-1

*Notes:

1) Actual address of property sampled.

TABLE 2

ANALYTICAL RESULTS

Sample Address	Sample ID	Concentration of Lead (mg/Kg)
Upwind		
14205 Cloverdale	CLV-14200-A-C-0-2	83
14205 Cloverdale	CLV-14200-B-C-0-1	74
14205 Cloverdale	CLV-14300-A-C-0-1	58
14205 Cloverdale	CLV-14300-B-C-0-1	60
14205 Cloverdale	CLV-14334-A-C-0-1	72
14205 Cloverdale	CLV-14334-B-C-0-2	66
14205 Cloverdale	CLV-14350-A-C-0-1	65
14205 Cloverdale	CLV-14350-B-C-0-1	43
14202 Greenlawn	GRN-14202-A-C-0-1	110
14202 Greenlawn	GRN-14202-B-C-0-1	66
14210 Greenlawn	GRN-14210-A-C-0-2	150
14210 Greenlawn	GRN-14210-B-C-0-1	170
Downwind		
14665 Dexter	DXT-14665-A-C-0-1	190
14665 Dexter	DXT-14665-B-C-0-1	230
14707 Dexter	DXT-14707-A-C-0-2	260
14707 Dexter	DXT-14707-B-C-0-1	250
14699 Petosky	PET-14699-A-C-0-1	230
14699 Petosky	PET-14699-B-C-0-2	40
14709 Petosky	PET-14709-A-C-0-1	130
14709 Petosky	PET-14709-B-C-0-1	130
14745 Quincey	QYN-14745-A-C-0-1	110
14745 Quincey	QYN-14745-A-C-0-1	98
14678 Livernois	LIV-14678-A-C-0-1	250
14678 Livernois	LIV-14678-B-C-0-1	**490**

*Notes

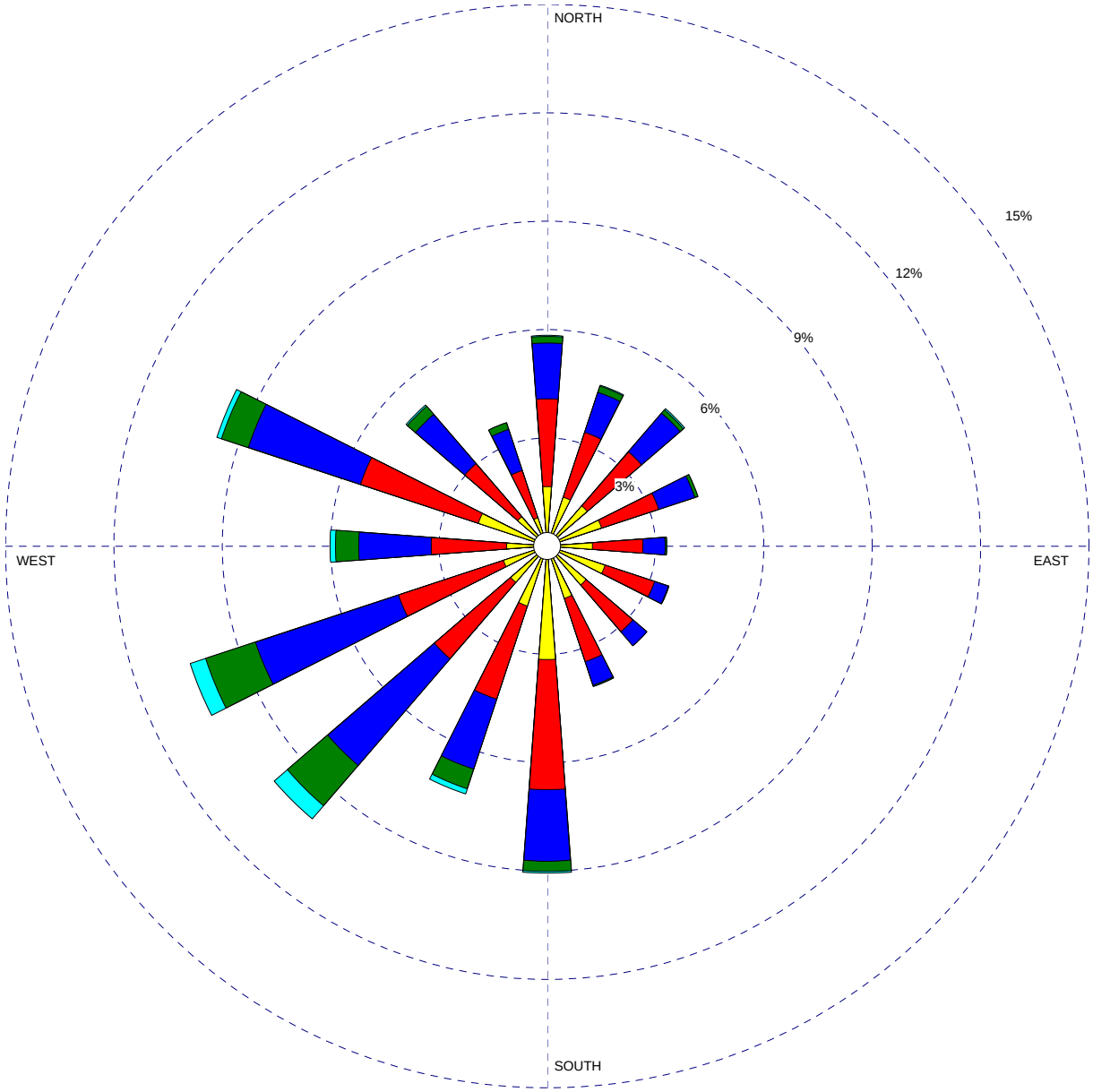
1) Bold indicates results equal to or greater than to 400 mg/kg.

ATTACHMENT C

WIND ROSE PLOT

WIND ROSE PLOT

STATION #94847 - DETROIT/METROPOLITAN ARPT, MI



Wind Speed (m/s)

> 10.8
8.8-10.8
5.7- 8.8
3.6- 5.7
2.1- 3.6
0.5- 2.1

	DATE **2/3/2003**	**Weston Solutions, Inc.**
DISPLAY **Wind Speed**	UNIT **m/s**	**Years** **1984-1991**
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**

WRPLOT View 2.22 by Lakes Environmental Software - www.lakes-environmental.com

ATTACHMENT D

PHOTOGRAPHS OF SAMPLING LOCATIONS

Former Detroit Lead Pipe Works – 7001 Lyndon

14200 Cloverdale – Vacant property located on the west side of Cloverdale St. The greenway was used on the corner of Cloverdale and Intervale.

Looking south along the greenway at 5 discrete sample A locations.

Looking north along the greenway at 5 discrete sample B locations.

Lyndon (cont'd)

14300 Cloverdale – Vacant property located on the west side of Cloverdale. Lot used.

Looking east along the vacant property at 5 discrete sample A locations.

Looking west along the vacant property at 5 discrete sample B locations.

Lyndon (cont'd)

14334 Cloverdale – Vacant property located on the west side of Cloverdale St and directly north of the vacant property at 14300 Cloverdale.

Looking east along the vacant property at 5 discrete sample A locations.

Sample B locations are located to the west of the sample A locations. Photo file was corrupt.

Lyndon (cont'd)

14350 Cloverdale – Vacant property located on the west side of Cloverdale St. Greenway used on the Corner of Cloverdale and an alley.

Looking south along the greenway at 5 discrete sample A locations.

Looking north along the greenway at 5 discrete sample B locations.

Looking south along the property of the total sampling area; including 14200, 14300, 14334, and 14350 Cloverdale.

Lyndon (cont'd)

14202 Greenlawn – Vacant property located on the east side of Greenlawn St and at the corner of Greenlawn and Intervale St.

Looking east along the vacant property at 5 discrete sample A locations.

Looking east along the vacant property at 5 discrete sample B locations. The total sampling area can be viewed in this photo.

Lyndon (cont'd)

14210 Greenlawn – House located on the east side of Greenlawn St. The front and the back yard were used for sampling.

Looking north along the back of the property at 5 discrete sample A locations.

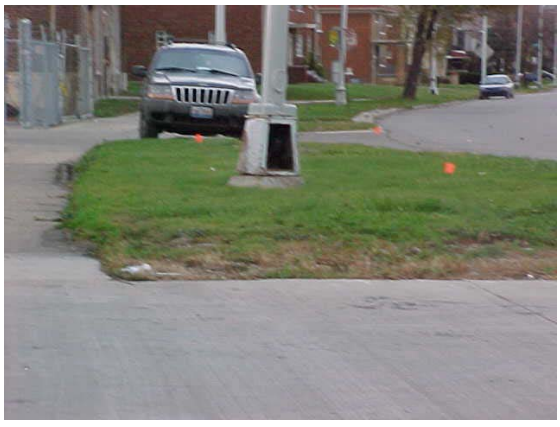
Looking east along the front of the property at 5 discrete sample B locations.

Lyndon (cont'd)

14665 Dexter – Greenway located on the west side of Dexter ST and to the east of a Police Recruitment Center.

Looking southeast along the greenway at 5 discrete sample A locations.

Looking east and northeast, respectively, along the greenway at 5 total discrete sample B locations.



Lyndon (cont'd)

14707 Dexter – Greenway located on the west side of Dexter St and to the east of a fenced in lot.

Looking north along the greenway at 10 total discrete sample A and B locations, respectively.

Lyndon (cont'd)

14699 Petosky – Vacant property located on the east side of Petosky St and it is the fourth vacant lot to the north of a house at 14723 Petosky.

Looking northeast along the vacant property at 5 discrete sample A locations.

Looking north along the vacant property at 5 total discrete sample B locations.

Lyndon (cont'd)

14709 Petosky – Vacant property located on the east side of Petosky St and it is the second vacant lot to the north of a house at 14723 Petosky.

Looking northeast along the vacant property at 5 discrete sample A locations.

Looking southwest and west, respectively, along the vacant property at 5 total discrete sample B locations.

Lyndon (cont'd)

14745 Quincey – Vacant property located on the west side of Quincey St and between two fenced vacant lots.

Looking west along the vacant property at 5 discrete sample A locations. The total sampling area can be viewed in this photo.

Looking west along the vacant property at 5 discrete sample B locations.

Lyndon (cont'd)

14678 Livernois – Greenway located on the east side of Livernois St and to the west of a fenced in lot containing Captain Hooks Used Auto Parts Building.

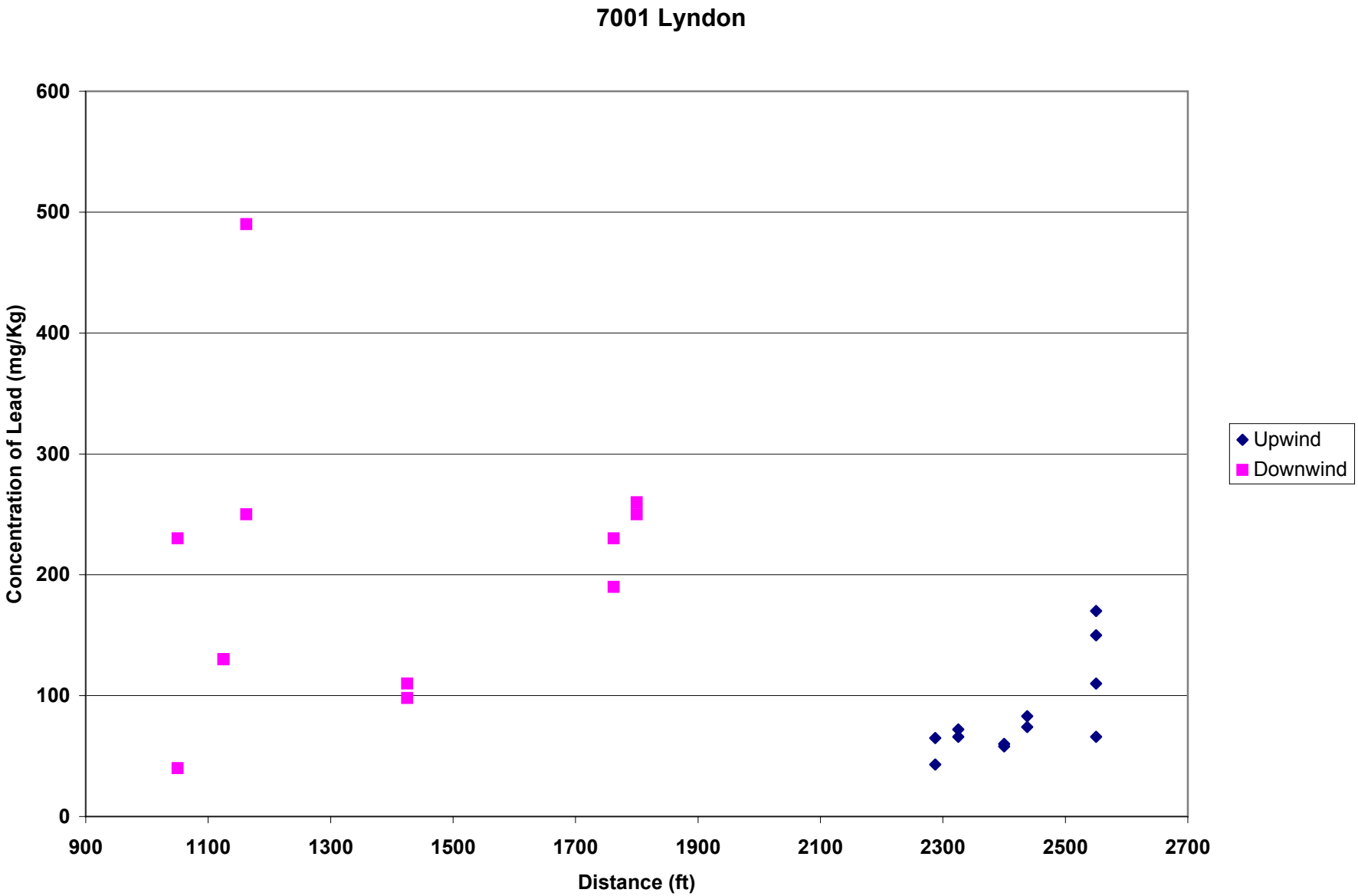
Looking south along the greenway at 5 discrete sample A locations.

Looking southeast along the greenway at 5 discrete sample B locations. Sample A locations can be seen further to the southeast.

Looking north along the greenway at the total sampling area.

ATTACHMENT E

CONCENTRATION GRAPH


7001 Lyndon
600
500
400
300
200
100
0
Concentration of Lead (mg/Kg)
900
1100
1300
1500
1700
1900
2100
2300
2500
2700
Distance (ft)
Upwind
Downwind

ATTACHMENT F

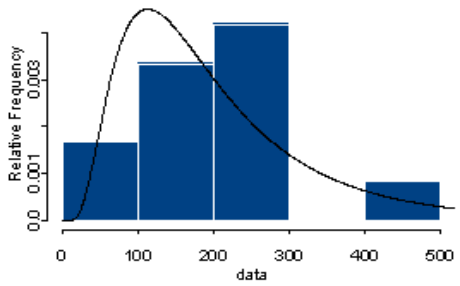
STATISTICAL DISTRIBUTION

DETROIT LEAD PIPE WORKS
STATISTICAL DISTRIBUTION

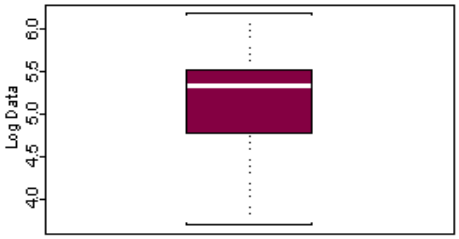
Lognormal Distribution Analysis for Data

Data Set Name: Detroit Lead Pipe , Area: LYN D

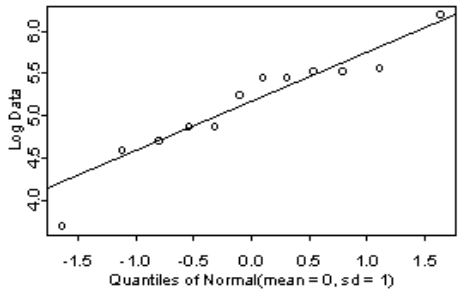
Histogram of Observed Data with Fitted Lognormal Distribution



Box Plot of Log Data Data



Normal Probability Plot of Log Data Data



Summary Statistics

Sample Size:	12
Coefficient of Variation:	0.1248702
Coefficient of Skewness:	-0.779296

Results of Shapiro-Wilk GOF

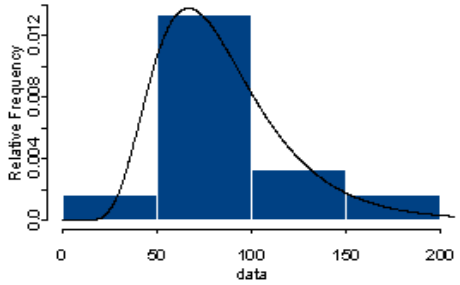
Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 5.135882 sdlog = 0.6413187
Test Statistic:	W = 0.9302184
Test Statistic Parameter:	n = 12
p-value:	0.382433

Since p >= .05 conclude distribution is lognormal.

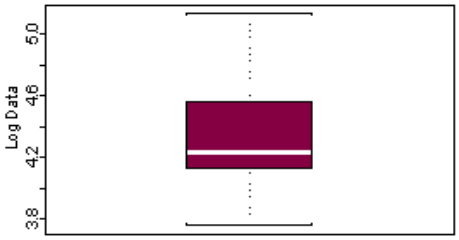
Lognormal Distribution Analysis for Data

Data Set Name: Detroit Lead Pipe , Area: LYN U

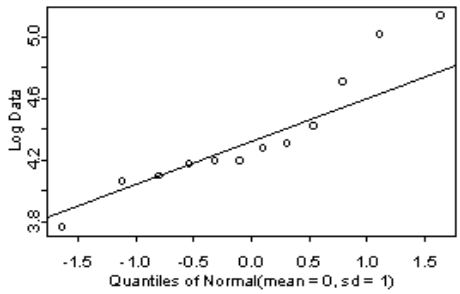
Histogram of Observed Data with Fitted Lognormal Distribution



Box Plot of Log Data Data



Normal Probability Plot of Log Data Data



Summary Statistics

Sample Size:	12
Coefficient of Variation:	0.0919063
Coefficient of Skewness:	0.8587

Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 4.359681 sdlog = 0.4006819
Test Statistic:	W = 0.902492
Test Statistic Parameter:	n = 12
p-value:	0.170808

Since p >= .05 conclude distribution is lognormal.