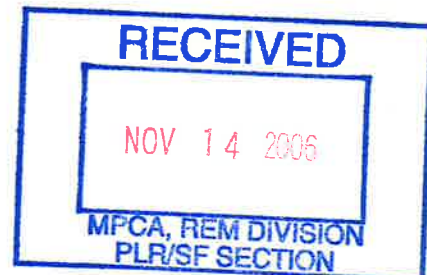


**DRAP IMPLEMENTATION REPORT**

**HI-LAKE SHOPPING CENTER  
HIAWATHA AVENUE & LAKE STREET  
MINNEAPOLIS, MINNESOTA  
DELTA PROJECT NO. A004-154**



**Prepared for:**

**Minnesota Pollution Control Agency  
Petroleum & Closed Landfill Remediation Section  
520 Lafayette Road  
St. Paul, Minnesota 55155**

**Prepared on behalf of:**

**Wellington Management, Inc.  
1625 Energy Park Drive, Suite 100  
St. Paul, Minnesota 55108  
(651) 292-9844**

**Prepared by:**

**Delta Environmental Consultants, Inc.  
5910 Rice Creek Parkway, Suite 100  
Shoreview, Minnesota 55126  
(651) 639-9449**

**November 2006**

**TABLE OF CONTENTS**

1.0 INTRODUCTION..... 1  
    1.1 Purpose and Authorization..... 1  
    1.2 Scope of Work..... 1  
2.0 SUBJECT AREA DESCRIPTION AND HISTORY ..... 2  
    2.1 Subject Area Location and Description..... 2  
    2.2 Subject Area History ..... 2  
3.0 OIL ROOM INVESTIGATION ..... 2  
4.0 FREIGHT ROOM EXCAVATION..... 3  
5.0 MIXED-USE REDEVELOPMENT EXCAVATION ..... 3  
    5.1 Excavation Summary ..... 3  
    5.2 Excavation Sampling Results ..... 4  
6.0 SOIL VAPOR BARRIER ..... 5  
7.0 CONCLUSIONS..... 5  
8.0 RECOMMENDATIONS..... 5  
9.0 REMARKS ..... 6

**List of Tables**

Table 1      Soil Vapor Reading Summary  
Table 2      Soil Analytical Results – Excavations  
Table 3      Soil Analytical Results – Stockpile

**List of Figures**

Figure 1     Site Location Map  
Figure 2     Site Layout Map  
Figure 3     Site Map with Sample Locations

**List of Appendices**

Appendix A   Laboratory Analytical Report – Excavations  
Appendix B   Laboratory Analytical Report – Stockpile  
Appendix C   Excavation Photographs

## DRAP IMPLEMENTATION REPORT

**HI-LAKE SHOPPING CENTER  
HIAWATHA AVENUE & LAKE STREET  
MINNEAPOLIS, MINNESOTA  
DELTA PROJECT NO. A004-154**

### 1.0 INTRODUCTION

#### 1.1 Purpose and Authorization

This document presents a summary of Development Response Action and Construction Contingency Plan (DRAP) implementation activities completed by Delta Environmental Consultants, Inc. (Delta) at the property known as the Hi-Lake Shopping Center, Hiawatha Avenue and Lake Street, Minneapolis, Minnesota (MPCA Leak# 15708 and VP19180(6200)). For this report, "subject property" refers to the southwest corner of the Hi-Lake Shopping Center property. Excavation and implementation activities were performed by Delta at the request of Wellington Management, Inc. (Wellington) with the authorization of the Minnesota Pollution Control Agency (MPCA).

This work was performed under the *Continuing Services Agreement*, dated October 30, 2000, between Delta and Wellington. The scope of work (SOW) was based on the DRAP Report submitted to the MPCA on behalf of Wellington on July 7, 2004, and the subsequent revisions. The excavation was conducted as part of the redevelopment activities, including the construction of the underground parking garage.

#### 1.2 Scope of Work

The excavation activities were conducted as part of the redevelopment of the property, including excavating for the footings and foundation of the underground parking area for the new mixed-use property redevelopment. Soils greater than four feet below ground surface were screened, as the previous excavation screened and removed impacted soils within four feet of the ground surface. In addition, a vapor barrier was installed following the excavation for the underground parking area and prior to slab installation.

The following scope of work was performed by Delta during this phase of the investigation:

- Conducted visual inspection of soils and collected soil grab samples from the trenches excavated in the oil room area. Samples were field screened with a photoionization detector (PID) to determine the presence of volatile organic compounds (VOCs). Analytical soil samples were collected from the base of the trenches and analyzed for VOCs by Environmental Protection Agency (EPA) Method 8260, polyaromatic hydrocarbons (PAHs) by EPA Method 8270, gasoline range organics (GRO) by the Wisconsin Method, and diesel range organics (DRO) by the Wisconsin Method.
- Conducted visual inspection of soils and collected soil grab samples from the excavation of the freight room area. Soils were screened with a PID to determine the presence of VOCs. Impacted soils, those with PID values of greater than 10 parts per million (ppm), were to be

stockpiled. No soils in this area had PID values greater than 10 ppm, therefore, no soil samples were collected for analysis.

- Conducted visual inspection of soils and collected soil grab samples from the main excavation area. Samples were field screened with a PID to determine the presence of VOCs every 20 cubic yards. Impacted soils, those with PID values of greater than 10 ppm, were stockpiled. Analytical soil samples were collected from base and sidewall locations throughout the excavated area. These samples were analyzed for VOCs.
- Conducted composite soil sampling of the stockpile. This sample was analyzed for VOCs, GRO, DRO, PAH, and lead (EPA 6010B).
- Conducted installation oversight of a vapor barrier to prevent vapor intrusion into the underground parking area.

## **2.0 SUBJECT AREA DESCRIPTION AND HISTORY**

### **2.1 Subject Area Location and Description**

The subject property is located at 15 UTM 480909E and 4977288N, on the northeast corner of the intersection of Lake Street and 21<sup>st</sup> Avenue South, Minneapolis, Hennepin County, Minnesota. A site location map is attached as **Figure 1**. The subject property is located at the southwest corner of the Hi-Lake Shopping Center. The subject property is being re-developed as Corridor Flats, condominiums over an Aldi grocery store. A site map is included as **Figure 2**.

### **2.2 Subject Area History**

Historically, the pertinent area of the subject property was operated as a gasoline station between 1950 and 1954, when two 4,000-gallon underground storage tanks (USTs) were removed from the site. The area was reconstructed as a gas station in 1957 with the installation of one 560-gallon used oil UST and two 6,000-gallon gasoline USTs at the site. The second gas station was demolished in 1974. A Burger King restaurant was developed on the property in 1977, but was demolished in December 2001. The site has been undeveloped since then.

A 110-foot by 110-foot area was excavated to a depth of 4 feet bgs on the southwest corner of the Hi-Lake Shopping Center property on April 22, 2005. Soils from areas exhibiting PID values above 10 ppm were segregated and stockpiled during excavation activities. Approximately 150 cubic yards of soil were excavated. The 2005 excavation was detailed in the May 20, 2005 Excavation Report.

## **3.0 OIL ROOM INVESTIGATION**

On December 22, 2005, two trenches were excavated to investigate the oil room area of the former trolley maintenance facility. The trenches were excavated to approximately 7 feet bgs. Railroad ties and other rubble were present in the soils below the asphalt surface.

Soil grab samples were collected to screen with a PID for the presence of VOCs. PID values were no greater than 0.1 ppm for any of the five grab samples collected. All soil grab samples were submitted to Pace Analytical for the analysis of VOCs, GRO, DRO, and PAH. VOCs and GRO were not detected above method detection limits in any samples. DRO was detected in two soil samples, SS-2 [7.0 micrograms per kilogram (ug/kg)] and SS-4 (12.9 ug/kg); the remaining samples were below method detection limits. Fluoranthene, phenanthrene, and pyrene were detected in SS-4 at concentrations of 594 ug/kg, 459 ug/kg, and 445 ug/kg, respectively; no other samples had concentrations of PAHs above method detection limits. Please refer to **Table 1** for a summary of PID results, **Table 2** for a summary of soil analytical results, **Figure 2** for the site layout map and trench locations and **Appendix A** for the laboratory analytical results.

#### **4.0 FREIGHT ROOM EXCAVATION**

As part of the redevelopment activities, the freight room area was excavated. Concrete footings approximately 3 feet thick, 10 feet tall, and 3 feet apart were present in the area. A concrete floor with rail lines was encountered approximately seven feet bgs. Please refer to **Figure 2** for the location of the freight room and the excavated area. Soil grab samples were collected throughout the excavation of this area and were screened for VOCs utilizing a PID. None of the soils exhibited a PID value above 10 ppm, therefore, no soil samples were collected for analysis. The concrete floor, concrete footings, and rail lines were removed as part of the excavation process.

#### **5.0 MIXED-USE REDEVELOPMENT EXCAVATION**

##### **5.1 Excavation Summary**

As part of the excavation to construct the footings and underground parking area of the mixed-use redevelopment, a 200-foot by 100-foot area was excavated. The 2005 excavation included the southern half of the mixed-use redevelopment area down to a depth of four feet. Prior to conducting this excavation, additional test pits were excavated to 10 feet below ground surface to determine if (and where) impacted soils were present. Test pits were located in accessible areas; as two stockpiles were present on the property prior to redevelopment activities (identified as the topsoil stockpile and concrete stockpile). Discussion of all stockpile analysis is located in section 5.2. Test pits were screened and potentially impacted soils were submitted to Pace for analysis. Following the excavation of the test pits, the redevelopment excavation began.



The base of the redevelopment excavation was completed to approximately 10 feet below ground surface. The excavation was conducted at the subject property by Ramsey Excavating of Minneapolis, Minnesota. Please refer to **Figure 2** for the site layout map and **Figure 3** for a sampling location map.

Soil samples collected for field screening by headspace method were placed in self-sealing quart-size polyethylene bags and filled so that the soil samples occupied approximately half of each bag's volume. Any visible soil clumps were manually broken up. Following a headspace vapor development period of approximately 15 minutes, the soil samples were screened using a Thermo Environmental Instruments Inc. Model 580B PID equipped with a 10.6 electron volt bulb. The PID is a trace gas analyzer capable of detecting total concentrations of VOCs to a minimum vapor concentration of approximately 1 ppm. Soils were screened by inserting the tip of the PID probe into the headspace of the bag samples and recording the highest meter readings. Headspace analysis was not performed on soil samples collected for laboratory analyses, but on replicate soil samples and grab samples from additional locations. PID results are shown on **Table 1**. The PID was operated in accordance with the manufacturer's instructions and calibrated daily with a standard calibration gas (100 ppm isobutylene) in a disposable cylinder.

Soils from areas exhibiting PID values above 10 ppm were segregated and stockpiled during excavation activities. The stockpiles were constructed north and east of the excavated area. Approximately 400 cubic yards of soil were stockpiled from the excavation area; ultimately, the soils were disposed of at Waste Management's Burnsville Sanitary Landfill. Excavated soils with PID values below 10 ppm were utilized as backfill following footing and basement construction. Compaction occurred in 1-foot lifts.

An analytical soil sample was collected from predetermined base and sidewall locations prior to construction and backfilling activities. Clean nitrile gloves were donned before the collection of each sample. Analytical samples from the sampling locations were submitted to Pace Analytical Services, Inc. (Pace) of Minneapolis, Minnesota, and analyzed for VOCs. An eight-point composite analytical sample was collected from the stockpile and submitted to Pace for analysis of VOCs, GRO, DRO, PAH, and lead. Please refer to **Tables 2 and 3** for summaries of soil analytical data. The analytical laboratory reports for the samples are enclosed in **Appendix A**. The analytical results of the soil samples are discussed in **Section 4.0**.

## 5.2 Excavation Sampling Results

Prior to the initiation of the excavation, samples collected from the two stockpiles [topsoil stockpile (approx. 200 c.y.) and concrete stockpile (approx. 10 c.y.)] were submitted for analysis of VOCs, GRO, DRO, PAH, and lead. VOCs and GRO were not present in concentrations above method detection limits.

DRO was present in both samples at concentrations of 32.5 mg/kg (topsoil stockpile) and 68.5 mg/kg (concrete stockpile). Several PAHs were present above method detection limits in both samples; however, none of the concentrations were above MPCA Tier I residential SRVs. The concrete material was recycled for road base by Ramsey Excavating and the topsoil was recycled by Ramsey Excavating for landscaping. Stockpile analytical data are summarized on **Table 3**. The laboratory analytical report is included in **Appendix B**.

Soil samples from the base and sidewalls of the main excavation were submitted to Pace and analyzed for VOCs. No soil samples collected from the base and sidewalls reported concentrations of any VOCs above method detection limits. The composite stockpile sample was submitted to Pace for analysis of VOCs, GRO, DRO, PAH, and lead. Soil analytical data are summarized on **Table 2**. The laboratory analytical report is included in **Appendix A**.

Analytical results from the stockpile samples indicated that the soils had no concentrations of VOCs above MPCA Tier I SRV limits. Concentrations of GRO and DRO were 32.9 milligrams per kilogram (mg/kg) and 42.4 mg/kg in one composite stockpile sample, <5.2 mg/kg GRO and 12 mg/kg DRO in the other stockpile sample. PAHs were detected; however, all concentrations were below Tier I SRVs. Lead was found in the stockpile at a concentration of 21.1 mg/kg. Soil analytical data from the stockpile are summarized on **Table 3**. The laboratory analytical report is included in **Appendix B**.

## **6.0 SOIL VAPOR BARRIER**

Following the completion of the excavation and the installation of the footings, a soil vapor barrier was installed before the concrete floor was poured. The vapor barrier consists of 6-mil thick polyethylene and was installed to overlap at least 2 feet at the edge under the floor, and was extended at least two feet up the wall to be joined with the water barrier. Photographs of the vapor barrier installation, as well as other photographs of the excavation, are presented in **Appendix C**.

## **7.0 CONCLUSIONS**

Analytical results for soil samples collected during the excavation were compared to the MPCA Tier 1 Residential Soil Reference Values (SRVs). None of the soils in the excavation base or sidewalls or from within the stockpiles exceeded SRVs.

## **8.0 RECOMMENDATIONS**

As the impacted soils have been excavated to a depth of approximately 10 feet below grade and all base and sidewall samples are non-detect for all analyses, no additional investigation or remediation is

recommended at this time. Delta recommends site file closures for MPCA Leak# 15708 and VP19180 (6200), associated with this property.

Delta also requests that the MPCA issue a "General Liability Letter" to Wellington as the remediation of the property has been completed.

### 9.0 REMARKS

The conclusions and recommendations contained in this report represent Delta's professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Delta and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Delta's client and anyone else specifically identified in writing by Delta as a user of this report. Delta will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Delta makes no express or implied warranty as to the contents of this report.

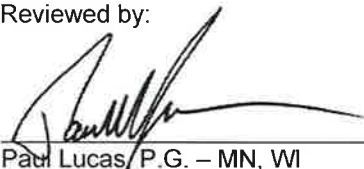
This report was prepared by DELTA ENVIRONMENTAL CONSULTANTS, INC.



Anna Blitz  
Staff Hydrogeologist

11/9/2006  
Date

Reviewed by:



Paul Lucas, P.G. – MN, WI  
Project Manager

11/9/2006  
Date



**TABLES**

**TABLE 1**  
**Soil Vapor Summary**  
 Hi-Lake Shopping Center  
 Delta Project No. A004-154

Sample ID	Depth (feet)	PID (ppm)
SS-1	7	0.1
SS-2	7	0.1
SS-3	7	0.0
SS-4	7	0.1
SS-5	7	0.0
TP-1	6	0.0
TP-1	10	0.0
TP-2	6	0.0
TP-2	10	1.5
TP-3	4	0.0
TP-3	7	1.5
TP-3	10	1.5
TP-4	4	1.3
TP-4	7	1.3
TP-4	10	111
TP-5	4	0.0
TP-5	7	0.0
TP-5	10	0.0
TP-6	4	0.0
TP-6	6	0.0
TP-6	10	0.0
1	8	0.0
2	8	0.0
3	8	0.0
4	6	9999*
5	6	9999*
6	6	22.3
7	6	9999*
8	6	423
9	8	0.0
10	8	0.0
11	8	0.0
12	8	0.0
13	8	0.0
14	8	0.0
15	7	0.0
16	7	0.0
17	6	0.0
18	8	0.0
19	8	0.0
20	8	0.0
21	6	0.0
22	6	0.0
23	6	0.0
24	6	0.0

Sample ID	Depth	PID (ppm)
25	6	0.0
26	6	0.0
27	8	0.0
28	5	0.0
29	6	0.0
30	6	0.0
31	8	0.0
32	8	126
33	6	14
34	6	0.0
35	7	0.0
36	6	0.0
37	6	0.0
38	7	0.0
39	7	0.0
40	5	0.0
41	6	0.0
42	8	0.0
43	5	0.0
44	6	0.0
45	6	0.0
46	7	0.0
47	5	0.0
48	8	0.0
49	8	2.0
50	7	1.5
51	6	0.0
52	6	0.0
A1WLW	6	0.0
A1B	8	0.0
A2WLW	6	0.0
A2B	9	0.0
A3WLW	6	0.0
A3WLS	6	0.0
A3B	12	0.0
B1B	8	0.0
B2B	9	0.0
B3WLS	6	0.0
B3B	12	0.0
C1WLW	6	0.0
C1B	8	0.0
C2WLS	6	0.0
C2B	8	0.0
C3WLE	6	0.0
C3WLS	6	0.0
C3B	10	0.0

Notes:  
 \* = maximum reading was achieved on the PID

**TABLE 2**  
**Soil Analytical Data Summary**  
 Hi-Lake Shopping Center  
 Delta Project No. A004-154

Sample ID	Location	Date	Depth	Benzene	Ethylbenzene	Naphthalene	Toluene	1,2,4-TMB	1,3,5-TMB	Xylenes
SS-1	Oil Room Trench	12/22/2005	7 feet	<52.1	<52.1	<261	<52.1	<261	<261	<782
SS-2	Oil Room Trench	12/22/2005	7 feet	<52.9	<52.9	<265	<52.9	<265	<265	<794
SS-3	Oil Room Trench	12/22/2005	7 feet	<52.7	<52.7	<264	<52.7	<264	<264	<791
SS-4	Oil Room Trench	12/22/2005	7 feet	<52.2	<52.2	<261	<52.2	<261	<261	<782
SS-5	Oil Room Trench	12/22/2005	7 feet	<52.2	<52.2	<261	<52.2	<261	<261	<783
TP-3	Multi-Use Excavation	6/2/2006	10 feet	<55.6	<55.6	<278	<55.6	<278	<278	<834
TP-4	Multi-Use Excavation	6/2/2006	10 feet	<57.0	<57.0	<del>269</del> 751	<57.0	751	341	<855
A1WLW	Multi-Use Excavation	6/22/2006	6 feet	<54.0	<54.0	<270	<54.0	<270	<270	<811
A1B	Multi-Use Excavation	6/22/2006	8 feet	<59.5	<59.5	<297	<59.5	<297	<297	<892
A2WLW	Multi-Use Excavation	6/27/2006	6 feet	<52.1	<52.1	<260	<52.1	<260	<260	<781
A2B	Multi-Use Excavation	6/27/2006	9 feet	<58.7	<58.7	<293	<58.7	<293	<293	<880
A3WLW	Multi-Use Excavation	6/27/2006	6 feet	<54.4	<54.4	<272	<54.4	<272	<272	<816
A3WLS	Multi-Use Excavation	6/28/2006	6 feet	<56.3	<56.3	<282	<56.3	<282	<282	<845
A3B	Multi-Use Excavation	6/28/2006	12 feet	<51.6	<51.6	<258	<51.6	<258	<258	<774
B1B	Multi-Use Excavation	6/22/2006	8 feet	<58.1	<58.1	<590	<58.1	<290	<290	<871
B2B	Multi-Use Excavation	6/27/2006	9 feet	<54.7	<54.7	<273	<54.7	<273	<273	<820
B3WLS	Multi-Use Excavation	6/29/2006	6 feet	<54.4	<54.4	<272	<54.4	<272	<272	<815
B3B	Multi-Use Excavation	6/29/2006	12 feet	<54.8	<54.8	<274	<54.8	<274	<274	<821
C1WLW	Multi-Use Excavation	6/27/2006	6 feet	<54.0	<54.0	<270	<54.0	<270	<270	<810
C1B	Multi-Use Excavation	6/27/2006	8 feet	<54.7	<54.7	<273	<54.7	<273	<273	<820
C2WLE	Multi-Use Excavation	7/10/2006	6 feet	<57.2	<57.2	<286	<57.2	<286	<286	<857
C2B	Multi-Use Excavation	7/10/2006	8 feet	<53.0	<53.0	<265	<53.0	<265	<265	<795
C3WLE	Multi-Use Excavation	6/29/2006	6 feet	<55.9	<55.9	<280	<55.9	<280	<280	<839
C3WLS	Multi-Use Excavation	6/29/2006	6 feet	<53.1	<53.1	<265	<53.1	<265	<265	<796
C3B	Multi-Use Excavation	6/29/2006	10 feet	<55.4	<55.4	<277	<55.4	<277	<277	<831
MPCA Tier I Residential SRV				1500	200000	10000	107000	5000	4000	110000

Notes:  
 All results are in micrograms per kilogram (ug/kg) unless otherwise noted.  
 NA = Not Analyzed  
 WL"X" = Wall Sample, Directional - west, south, or east.  
 B = Base Sample  
 \* = Included in the Benzo(a)pyrene equivalent; weighted values not to exceed 2000 ug/kg.

**TABLE 2**  
**Soil Analytical Data Summary**  
 Hi-Lake Shopping Center  
 Delta Project No. A004-154

Sample ID	Location	Date	Depth	GRO mg/kg	DRO mg/kg	Fluoranthene	Phenanthrene	Pyrene
SS-1	Oil Room Trench	12/22/2005	7 feet	<5.1	<5.2	<344	<344	<344
SS-2	Oil Room Trench	12/22/2005	7 feet	<5.5	7.0	<349	<349	<349
SS-3	Oil Room Trench	12/22/2005	7 feet	<5.5	<6.8	<348	<348	<348
SS-4	Oil Room Trench	12/22/2005	7 feet	<5.2	12.9	594	459	445
SS-5	Oil Room Trench	12/22/2005	7 feet	<5.2	<5.8	<344	<344	<344
TP-3	Multi-Use Excavation	6/2/2006	10 feet	NA	NA	NA	NA	NA
TP-4	Multi-Use Excavation	6/2/2006	10 feet	NA	NA	NA	NA	NA
A1WLW	Multi-Use Excavation	6/22/2006	6 feet	NA	NA	NA	NA	NA
A1B	Multi-Use Excavation	6/22/2006	8 feet	NA	NA	NA	NA	NA
A2WLW	Multi-Use Excavation	6/27/2006	6 feet	NA	NA	NA	NA	NA
A2B	Multi-Use Excavation	6/27/2006	9 feet	NA	NA	NA	NA	NA
A3WLW	Multi-Use Excavation	6/27/2006	6 feet	NA	NA	NA	NA	NA
A3WLS	Multi-Use Excavation	6/28/2006	6 feet	NA	NA	NA	NA	NA
A3B	Multi-Use Excavation	6/28/2006	12 feet	NA	NA	NA	NA	NA
B1B	Multi-Use Excavation	6/22/2006	8 feet	NA	NA	NA	NA	NA
B2B	Multi-Use Excavation	6/27/2006	9 feet	NA	NA	NA	NA	NA
B3WLS	Multi-Use Excavation	6/29/2006	6 feet	NA	NA	NA	NA	NA
B3B	Multi-Use Excavation	6/29/2006	12 feet	NA	NA	NA	NA	NA
C1WLW	Multi-Use Excavation	6/27/2006	6 feet	NA	NA	NA	NA	NA
C1B	Multi-Use Excavation	6/27/2006	8 feet	NA	NA	NA	NA	NA
C2WLE	Multi-Use Excavation	7/10/2006	6 feet	NA	NA	NA	NA	NA
C2B	Multi-Use Excavation	7/10/2006	8 feet	NA	NA	NA	NA	NA
C3WLE	Multi-Use Excavation	6/29/2006	6 feet	NA	NA	NA	NA	NA
C3WLS	Multi-Use Excavation	6/29/2006	6 feet	NA	NA	NA	NA	NA
C3B	Multi-Use Excavation	6/29/2006	10 feet	NA	NA	NA	NA	NA
MPCA Tier I Residential SRV				--	--	*	*	*

Notes:  
 All results are in micrograms per kilogram (ug/kg) unless otherwise noted  
 NA = Not Analyzed  
 WL "X" = Wall Sample, Directional - west, south, or east.  
 B = Base Sample  
 \* = Included in the Benzo(a)pyrene equivalent; weighted values not to e>

**TABLE 3**  
**Stockpile Analytical Summary**  
 Hi-Lake Shopping Center  
 Delta Project No. A004-154

Sample ID	Date	Benzene	Ethylbenzene	Naphthalene	Toluene	Xylenes	GRO mg/kg	DRO mg/kg	Lead mg/kg
Stockpile (Topsoil) LG	6/7/2006	<52.8	<52.8	<264	<52.8	<792	<5.1	32.5	37.1
Stockpile (Concrete) SM	6/7/2006	<50.0	<50.0	<250	<50.0	<750	<5.3	68.5	179
Stockpile	6/28/2006	<54	240	459	180	2000	32.9	42.4	21.1
Stockpile 2	7/20/2006	<52	<52	NA	<52	<150	<5.2	12	17.7
MPCA Tier I Residential SRVs		1500	200000	10000	107000	110000	-	-	400

Sample ID	Date	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Chrysene	Fluoranthene	Phenanthrene	Pyrene
Stockpile (Topsoil) LG	6/7/2006	<260	403	298	509	<260	<260	275	775	576	717
Stockpile (Concrete) SM	6/7/2006	<51.1	107	70.7	130	76.4	74.9	87.5	169	110	127
Stockpile	6/28/2006	43.7	117	124	172	93.6	63	134	199	126	200
Stockpile 2	7/20/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MPCA Tier I Residential SRVs		7880000	*	2000	*	*	*	*	*	*	*

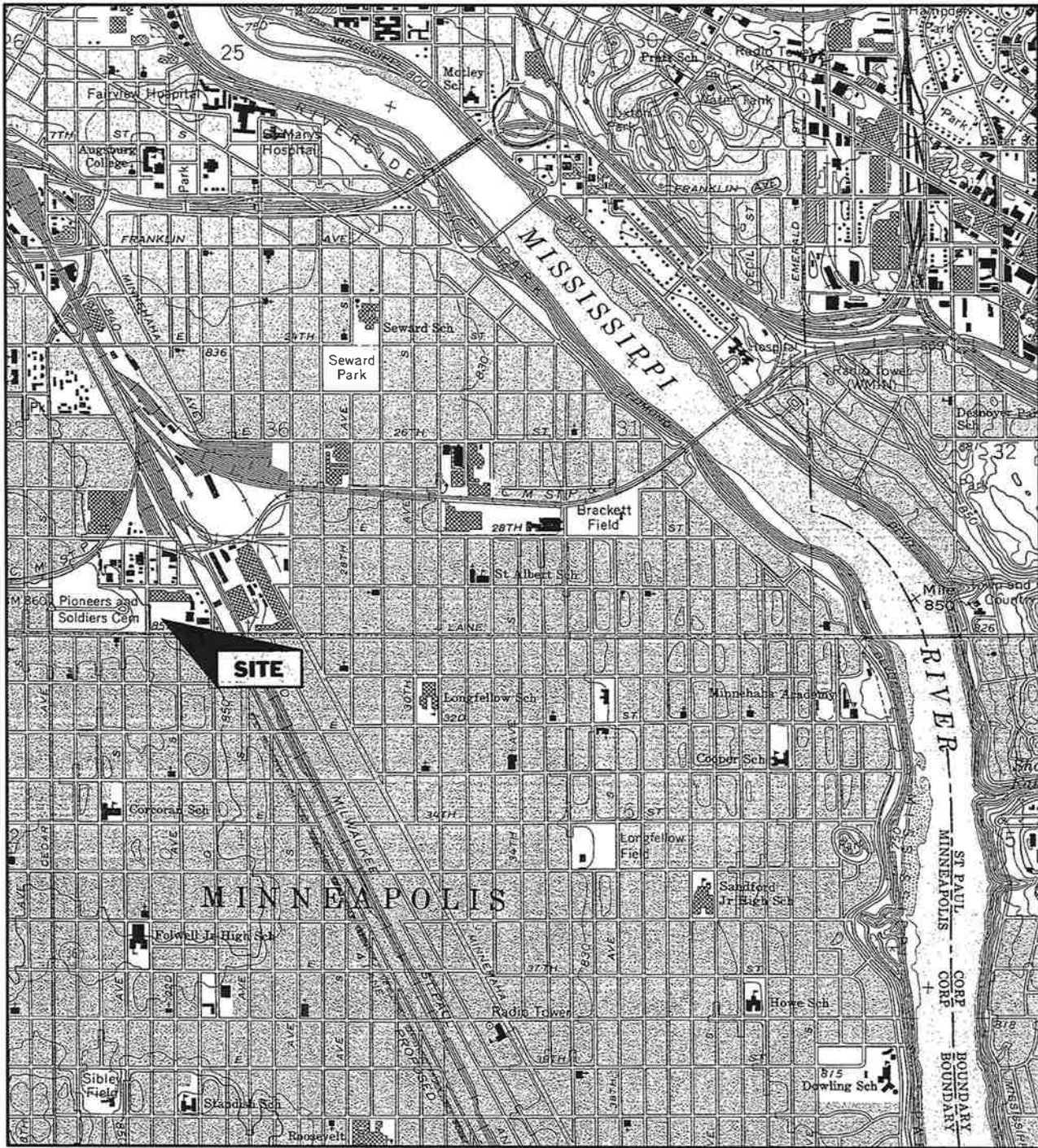
**Notes:**

All results in micrograms per kilogram unless otherwise noted.

\* = Included in the Benzo(a)pyrene equivalent; weighted values not to exceed 2000 ug/kg.



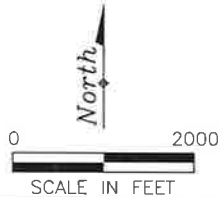
**FIGURES**



ST. PAUL WEST QUADRANGLE  
 MINNESOTA  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 1967 PHOTOREVISED 1972  
 PHOTOINSPECTED 1977



QUADRANGLE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**HI-LAKE SHOPPING CENTER**  
**HIAWATHA AVENUE AND LAKE STREET**  
**MINNEAPOLIS, MINNESOTA**

PROJECT NO.  
 A094-154

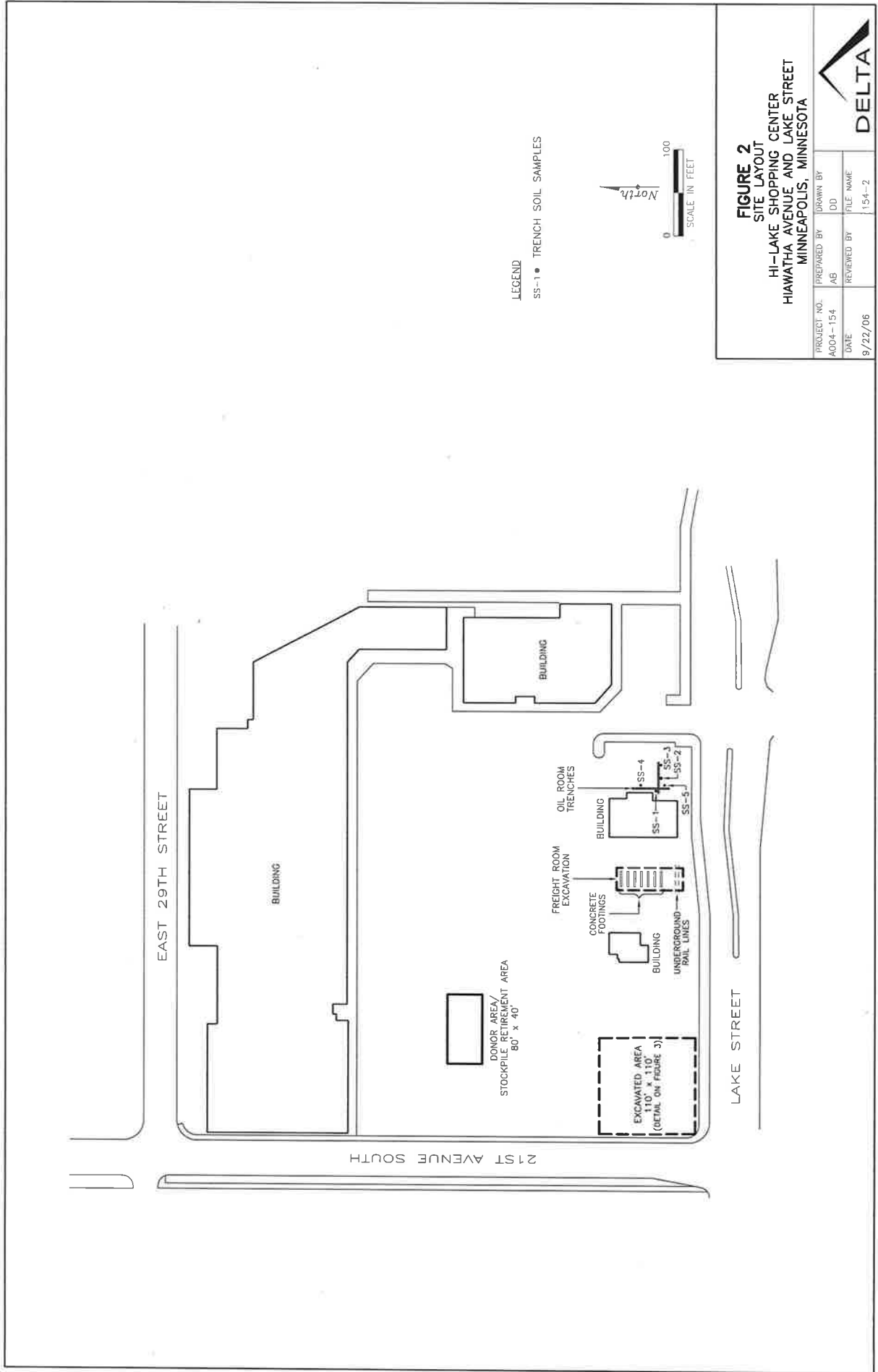
DATE  
 5/8/05

PREPARED BY  
 AB

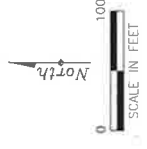
REVIEWED BY



**Delta**  
 Environmental  
 Consultants, Inc.



LEGEND  
 SS-1 • TRENCH SOIL SAMPLES

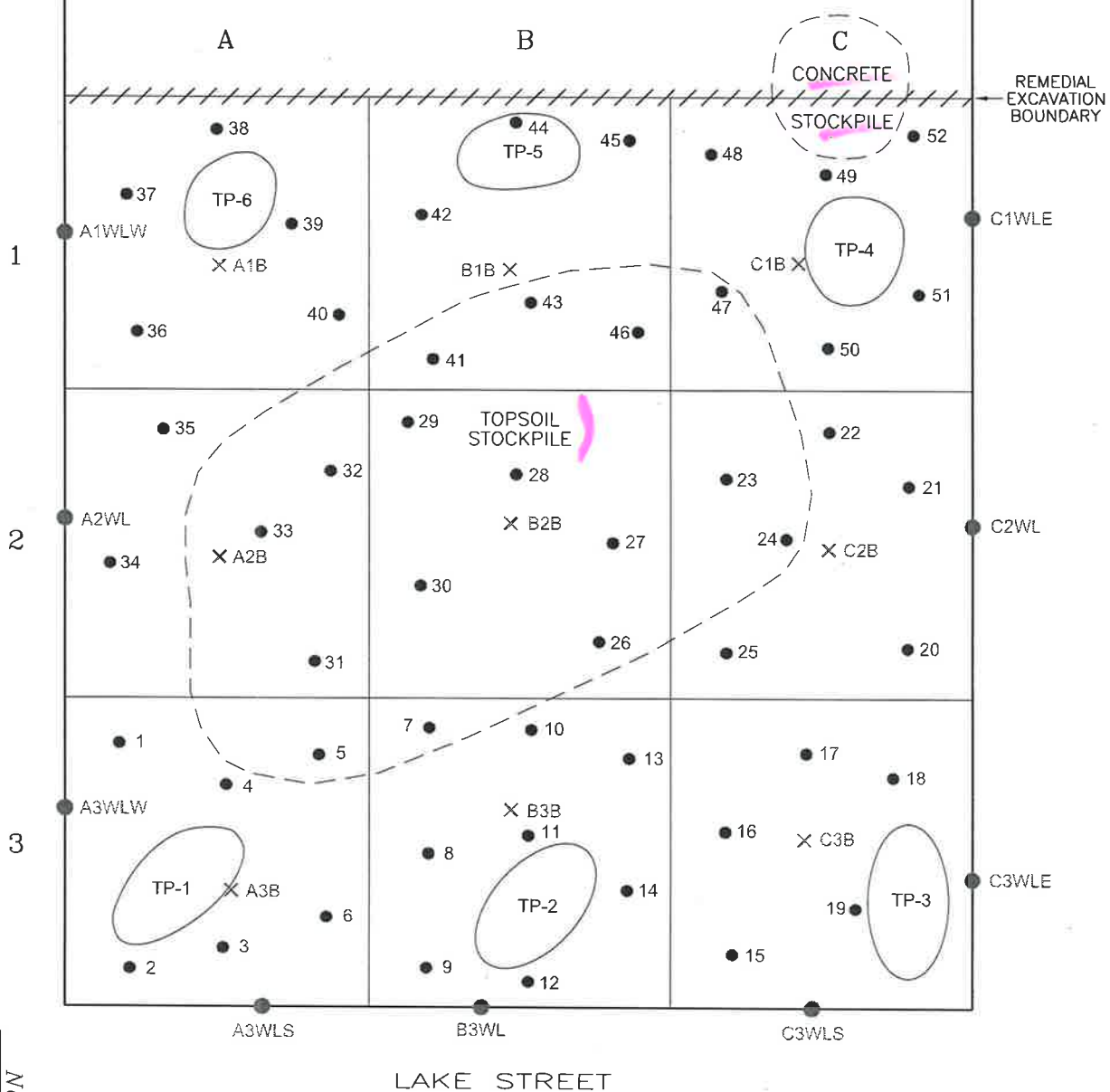


**FIGURE 2**  
 SITE LAYOUT  
 HI-LAKE SHOPPING CENTER  
 HIAWATHA AVENUE AND LAKE STREET  
 MINNEAPOLIS, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
A004-154	AB	DD
DATE	REVIEWED BY	FILE NAME
9/22/06		154-2



ADDITIONAL ALDI EXCAVATION AREA



LEGEND

- X ● SAMPLE LOCATIONS
- TP = TEST PIT
- WL = WALL
- B = BASE
- W,E,S = DIRECTIONS



**FIGURE 3**  
**SAMPLE LOCATION MAP**  
**HI-LAKE SHOPPING CENTER**  
**HIAWATHA AVENUE & LAKE STREET**  
**MINNEAPOLIS, MINNESOTA**

PROJECT NO. A004-154	PREPARED BY AB	DRAWN BY DD
DATE 9/15/06	REVIEWED BY	FILE NAME 154-Site

