

Mr. Peter Quackenbush
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Subject:
Soil Corrective Measures Work Plan – October 2, 2017
RACER Trust Plant 6 Property MID 005 356 928
Lansing, Michigan

ENVIRONMENT

Dear Mr. Quackenbush:

Date:
October 2, 2017

Arcadis of Michigan, LLC (Arcadis) is pleased to provide this Soil Corrective Measures Work Plan (Work Plan) to replace the July 28, 2017 Exposure Barrier Work Plan for the RACER Trust, Plant 6 Property located at 401 North Verlinden Street in Lansing, Michigan (Site). This Work Plan documents how soils exceeding the Michigan Part 201 2012 and draft 2017 Nonresidential (NR) Direct Contact (DC) Criteria and Particulate Soil Inhalation Criteria (PSIC) adjusted for a 100-acre source area (adjusted PSIC) will be addressed at the Site. Note that soils exceeding other 2012 and draft 2017 NR Generic Cleanup Criteria will be addressed through deed restrictions included in the Declaration of Restrictive Covenant (Restrictive Covenant) being prepared for the Site.

Contact:
Randy Christensen

Phone:
810.225.1940

Email:
randy.christensen@arcadis.com

Our ref:
B0064481.2017

Please note that this Work Plan has changed significantly from the original plan submitted on March 30, 2017, as well as the revised version submitted on July 28, 2017. The primary change is related to the criteria used for comparison. The original work plan dated March 30, 2017 was based on soil data compared to the Michigan Part 201 draft 2016 Residential DC Criteria and generic PSIC for a ½-acre source area. The revised work plan dated July 28, 2017 was based on a comparison to the draft 2016 NR DC Criteria and generic PSIC for a ½-acre source area.

The following version is based on a comparison of soil data to 2012 and draft 2017 NR DC Criteria and adjusted PSIC. This version also takes into consideration additional samples collected in Area 7 to evaluate the 2012 NR DC Criteria exceedance for benzo(a)pyrene in near surface soils.

Comparison to NR criteria is appropriate because the Restrictive Covenant being prepared for the property includes a prohibition of uses that are not compatible with or are inconsistent with the exposure assumptions for the NR cleanup criteria. Comparison to draft 2017 criteria proactively complies with potential

future regulations and these criteria are believed to represent the MDEQ's determination of the most scientifically appropriate criteria. Based on the 2012 and draft 2017 NR criteria, only one area requires cover (exposure barrier): the area referred to as the "lead exceedance area" (Area 5-6) (**Figure 1**). The current cover at Area 5-6 consists of asphalt and concrete surface cover that will be sufficient to provide an exposure barrier for the exceedances in this area. Please also note:

- The draft 2017 NR DC Criteria exceedance of vanadium in Area 5-7 (**Figure 1**) at a depth of 4 to 5 feet below ground surface (ft bgs) (860 to 859 feet above mean sea level [ft msl]) will be noted in the Restrictive Covenant planned for the Site; however, a barrier is not proposed for this area.
- Based on a site-specific risk analysis for manganese presented later in this Work Plan, concentrations that exceed the 2012 NR adjusted PSIC in Area 5-8 do not exceed the draft 2017 NR adjusted PSIC and no further action is proposed for Area 5-8.
- The concentration of cobalt in one sample (SB-A5.7-MW223 at 1 to 2 ft bgs [863.5 to 862.5 ft msl]) - exceeds the draft 2017 NR adjusted PSIC. However, based on a site-specific risk analysis presented later in this Work Plan, no further action is proposed to address cobalt in Area 5-7.
- The concentration of total xylenes in one sample (B-96-B at 9 to 11 ft bgs [862 to 860 ft msl]) exceeds the 2012 NR DC Criteria; however, based on additional evaluation of this exceedance presented later in this Work Plan, no further action is proposed to address total xylenes in Area 7.
- Resampling and delineation of the 2012 NR DC benzo(a)pyrene exceedance determined that there are no exceedances of 2012 or draft 2017 NR DC Criteria and, therefore, no further action is necessary for Area 7.

BACKGROUND

In the draft CMS, submitted in June 2014, exposure barriers consisting of existing surface cover or new clean surface cover were proposed as part of the final corrective measures for three areas at the Site where shallow soil exceeded 2011/2012 NR DC Criteria and/or PSIC (both generic and site-specific criteria were considered), including Areas 5-6, Area 5-8, and Area 7. The exposure barriers were re-evaluated based on the 2012 and draft 2017 NR DC Criteria and adjusted PSIC. The 2012 and draft 2017 NR DC Criteria and adjusted PSIC exceedances for the Site are summarized on **Table 1**. Cover is required for shallow soils exceeding NR DC Criteria for lead in Area 5-6 (**Figure 1**).

Note that when soil analytical results are compared to the draft 2017 NR DC Criteria and adjusted PSIC, there are no exceedances in Area 7, but lead exceeds the adjusted PSIC in Area 5-6 and vanadium exceeds DC Criteria in Area 5-7. The proposed exposure barrier for Area 5-6 covers all exceedances of the 2012 and the draft 2017 NR DC Criteria and PSIC. In addition, notification of the draft 2017 NR DC Criteria exceedance of vanadium in Area 5-7 will be provided in the Restrictive Covenant being prepared for the Site.

Site-Specific Risk Analysis for PSIC

A site-specific risk analysis was completed to evaluate exceedances of the 2012 NR adjusted PSIC and the draft 2017 NR adjusted PSIC (MDEQ, 2007). As an initial screen, concentrations of constituents in soil were compared to the generic NR PSIC, which, based on the size of the Site, was adjusted (multiplied) by a factor to account for a 100-acre source area (adjusted PSIC). Samples that exceeded the adjusted PSIC were identified as individual source areas. The size of each individual

source area was determined based on the distances to the closest soil borings that did not exceed the adjusted PSIC, and the areas of each individual source area were added together for each constituent to get a total source area size for that constituent (i.e., the sum of the individual source areas for manganese was less than 5 acres, and sum of the cobalt exceedance areas was less than ½ acre). The concentrations of each constituent with initial exceedances were then re-screened against the adjusted PSIC for the final source area size.

As stated above, the final source area size for manganese was 5 acres, and the 2012 NR adjusted PSIC for a 5-acre source area is 990,000 micrograms per kilogram (µg/kg). One sample (SA 11-5 0.7 to 2.7 ft bgs [874 to 872 ft msl]) at Area 5-8 exceed the 2012 NR PSIC for a 5-acre source area; however, the concentration did not exceed the draft 2017 NR PSIC adjusted for a 5-acre source area (15,200,000 µg/kg). Therefore, no further action is proposed for manganese exceeding PSIC at the Site.

Concentrations of cobalt at the Site did not exceed the 2012 adjusted PSIC; however, the concentration of cobalt in one sample in Area 5-7 (SB-A5.7-MW223 at 1 to 2 ft bgs [863.5 to 862.5 msl) exceeded the draft 2017 NR adjusted PSIC. Only 2 samples across all three plants had concentrations of cobalt that exceeded the draft 2017 NR adjusted PSIC, and the final source area for cobalt was determined to be less than ½ acre. The generic (unadjusted) draft 2017 NR PSIC are based on a source area size of ½ acre. Therefore, the cobalt concentrations were compared to the generic draft 2017 NR PSIC (330,000 µg/kg). The maximum detected concentration of cobalt at the Site, 157,000 µg/kg, does not exceed the generic draft 2017 NR PSIC; therefore, no further action is proposed for cobalt at the Site.

Further Evaluation for Xylenes in Area 7

The concentration of total xylenes (299,000 µg/kg) in one sample in Area 7 (B-96-B at 9 to 11 ft bgs [862 to 860 ft msl]) exceeded the 2012 NR DC Criteria, which was based on the soil saturation level. This concentration did not exceed the 2012 risk-based criterion (greater than 1.0E+09 µg/kg), or the draft 2017 NR DC Criterion of 1.0E+08 µg/kg, which is based on a maximum allowable concentration of 10 percent. Because the total xylenes concentration did not exceed the 2012 risk-based NR DC Criterion or the draft 2017 NR DC Criterion, no further action is proposed for total xylenes in Area 7.

Area 7 Additional Sampling

The consideration of an exposure barrier at Area 7 was based on a single concentration of benzo(a)pyrene, exceeding 2012 NR DC (but not draft 2017) Criteria¹, identified from 0 to 1 ft bgs (867 to 866 ft msl) in soil boring SB-A7-SX206 in 2012. Soil Boring SB-A7-SX206 is in a small (approximately 15 ft by 15 ft) unpaved, vegetated portion of Area 7 surrounded by the concrete

¹ The draft 2017 MDEQ Part 201 criteria tables do not have DC Criteria for the individual carcinogenic PAHs. Rather, the seven carcinogenic PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) are evaluated as benzo(a)pyrene toxic equivalents (TEQ) by multiplying the concentrations of each individual carcinogenic PAH by its benzo(a)pyrene toxic equivalency factor (TEF), and summing them for a per sample benzo(a)pyrene TEQ, which is then compared to the draft 2017 NR DC criterion for benzo(a)pyrene. The calculation of the benzo(a)pyrene TEQs for the delineation samples are provided in **Attachment 1, Table 1**.

making up the southern entryway to the Site. Per the July 28, 2017 work plan, additional soil sampling was completed in August 2017 to verify the SB-A7-SX206 result and delineate benzo(a)pyrene and other polycyclic aromatic hydrocarbons (PAHs). Four (4) soil borings, including a boring completed adjacent to the original SB-A7-SX206 location and three step-out locations, were advanced to an approximate depth of 3 ft bgs using a stainless-steel hand auger. At each boring, samples were collected from the 0 - 1 ft bgs and 2 - 3 ft bgs intervals. A figure summarizing the sample results, a summary table, and the laboratory analytical reports are included as **Attachment 1**.

All samples were below 2012 and draft 2017 NR DC Criteria and adjusted PSIC for PAHs. In addition, the original exceedance for benzo(a)pyrene noted at boring SB-A7-SX206 does not exceed the draft 2017 DC Criteria. Based on the results of the resampling and delineation, no further action is proposed for Area 7.

SCOPE OF WORK

Area 5-6 Exposure Barrier

The proposed exposure barrier at Area 5-6 consists of an approximately 29,000 square ft area of existing asphalt and concrete (**Figure 2**). Lead exceeds 2012 and draft 2017 NR DC Criteria from 0.5 to 7.5 ft bgs (866.5 to 859.5 ft msl) in this area, and lead also exceeds the 2017 Site-specific PSIC from 6 to 7 ft bgs (860.5 to 859.5 ft msl) at boring SB-A5-.6-NP224. Based on boring logs, the concrete at Area 5-6 ranges from 8 to 11 inches thick and the asphalt ranges from 6 to 9 inches thick. As an adequate exposure barrier is already present in this area, no additional cover placement is required.

Area 5-7 Notification

In anticipation of draft 2017 Michigan cleanup criteria promulgation, a notification of the isolated exceedance of the draft 2017 NR DC Criteria exceedance for vanadium at a depth of approximately 4-5 ft bgs (860 to 859 ft msl) in Area 5-7 will be included in the Restrictive Covenant being prepared for the Site.

Maintenance

The proposed exposure barrier will be inspected on an annual basis. The inspection will evaluate signs of weathering, erosion, settlement and/or excessive vegetation growth that could result in contact with the impacted soil. Inspections will be documented with the inspection form (**Attachment 2**). Maintenance of the barrier will be performed, as necessary, to maintain the barrier to underlying impacted soil. The frequency of inspections may be modified pending MDEQ approval.

Inclusion in Declaration of Restrictive Covenant

The proposed exposure barrier will be included in the Restrictive Covenant being prepared for the Site. The Restrictive Covenant will include a provision that prohibits any excavation or other intrusive activity that could affect the integrity of the barrier without prior MDEQ and RACER Trust written approval, and that any excavation or other intrusive activity, including removing, altering or disturbing the barrier, that could affect the integrity of the barrier, must be restored with a barrier that provides at least an equivalent degree of protection as the original barrier.

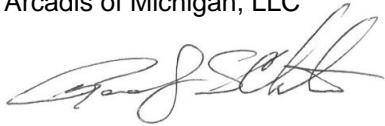
In addition, and as discussed above, a notification of the isolated exceedance of the draft 2017 NR DC Criteria exceedance for vanadium at a depth of approximately 4-5 ft bgs (860-859 ft msl) in Area 5-7 will be included in the Restrictive Covenant being prepared for the Site.

Based on MDEQ approval of this Work Plan, the Restrictive Covenant will be adjusted, as necessary, and provided to MDEQ for review.

Please contact Randy Christiansen at 810.225.1940 or David Favero with RACER at 734.879.9525 if you have any questions regarding this Work Plan.

Sincerely,

Arcadis of Michigan, LLC



Randy Christensen
Certified Project Manager

Enclosures:

Figures

- 1 Plant 6 Site Layout and Features
- 2 Area 5-6 Exposure Barrier

Tables

- 1 Soil Exceedances Summary

Attachments

- 1 Area 7 Investigation Results
- 2 Plant 6 Exposure Barrier Inspection Form

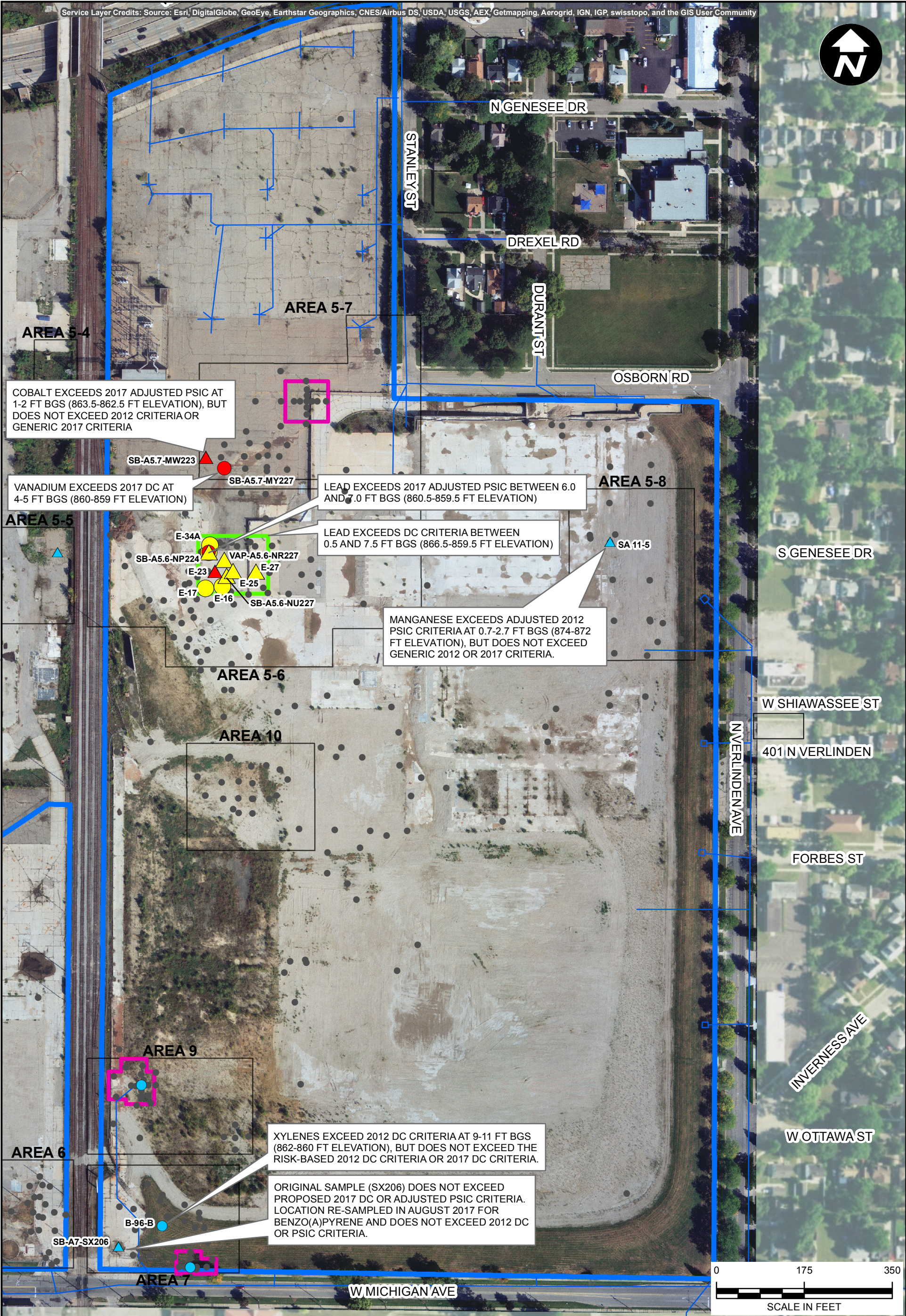
References

MDEQ. 2007. RRD Operational Memorandum No. 1, Technical Support Document – Attachment 7. Part 201 Generic Soil Inhalation Criteria for Ambient Air, Part 213 Tier I Soil Inhalation Risk-Based Screening Levels for Indoor Air. July.

Soil Corrective Measures Work Plan
RACER Trust Plant 6 – Lansing, Michigan

FIGURES





LEGEND

- | | | |
|--|---------------------------------------|--|
| ▲ 2012 EXCEEDANCE AT 0-2 FT BGS | ● 2012 EXCEEDANCE > 2 FT BGS | ● SOIL SAMPLE LOCATIONS BELOW DC AND PSIC CRITERIA |
| ▲ 2017 EXCEEDANCE AT 0-2 FT BGS | ● 2017 EXCEEDANCE > 2 FT BGS | — CURRENT STORM SEWERS (OBG, MAY 2009) |
| ▲ 2012 AND 2017 EXCEEDANCE AT 0-2 FT BGS | ● 2012 AND 2017 EXCEEDANCE > 2 FT BGS | — EXISTING CONCRETE AND ASPHALT COVER |
| | | — COMPLETED EXCAVATION |
| | | — PLANT 6 |
- NOTE**
1. ALL SOIL SAMPLES SHOWN COLLECTED PRIOR TO JULY 2012, WITH THE EXCEPTION OF RESAMPLING ACTIVITIES COMPLETED AT SB-A7-SX206 IN AUGUST 2017.
 2. "ADJUSTED" PSIC REFERS TO THE GENERIC PSIC MODIFIED FOR A 100-ACRE SOURCE AREA.
 3. COORDINATE SYSTEM IS IN NAD_1983_StatePlane_Michigan_South_FIPS_2113_Feet_Intl

RACER TRUST
PLANT 6
LANSING, MICHIGAN

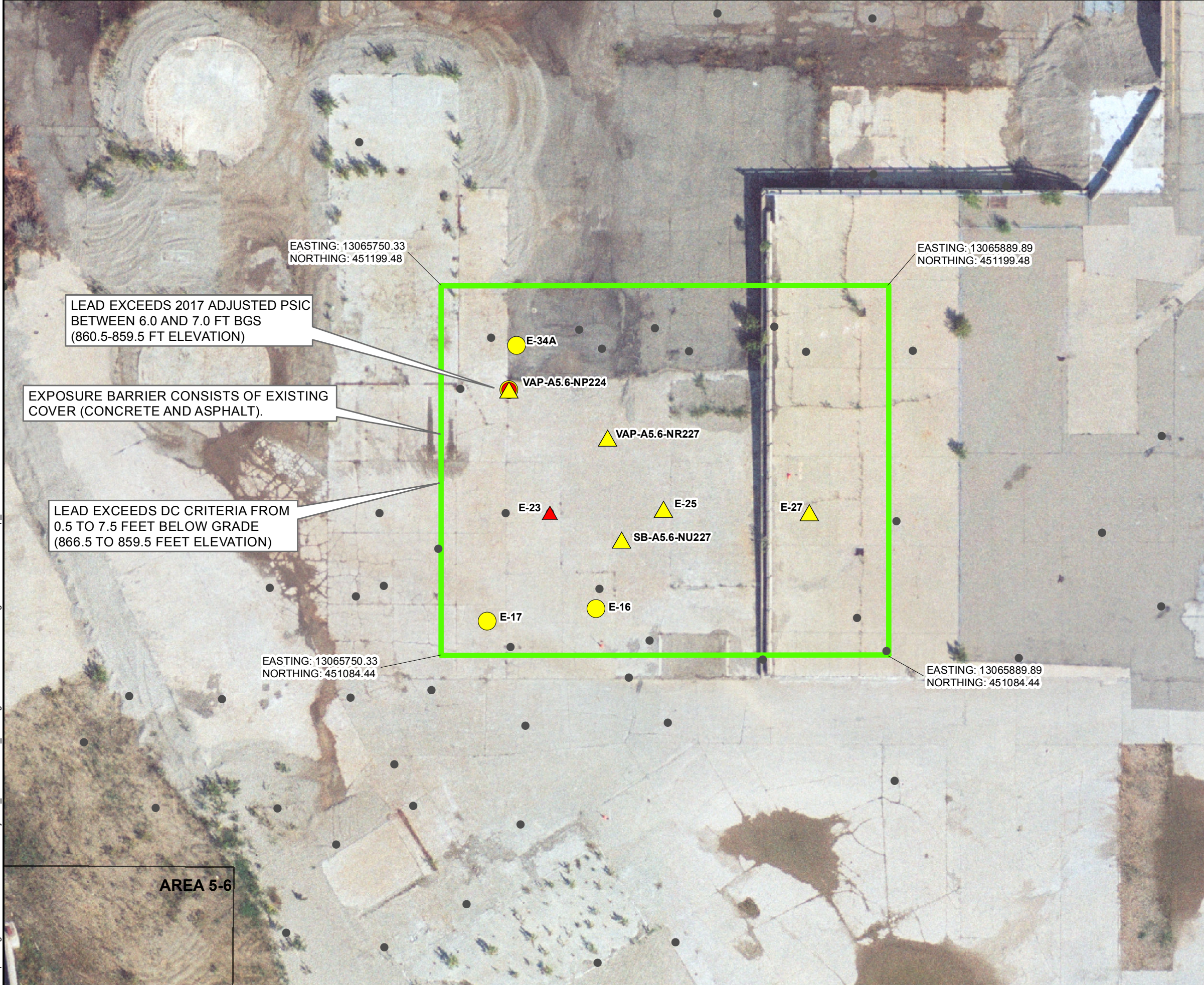
PLANT 6 SOIL CORRECTIVE MEASURES



FIGURE

1

CITY: Novi DIV: ENV DB: TRY PIC: PM: TM: TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\corporate\Data\ArcGISData\GISProjects\ENV\RACER_Lansing\Docs\Plant 6 RCRA\Figure 2 - Area 5-6 Cap. 2013-2016.mxd PLOTTED: 9/26/2017 12:04:24 PM BY: dolexa



LEGEND

- ▲ 2017 EXCEEDANCE AT 0-2 FT BGS
- ▲ 2012 AND 2017 EXCEEDANCE AT 0-2 FT BGS
- 2017 EXCEEDANCE > 2 FT BGS
- 2012 AND 2017 EXCEEDANCE > 2 FT BGS
- SOIL SAMPLE LOCATIONS BELOW DC AND PSIC CRITERIA
- EXISTING CONCRETE AND ASPHALT COVER AS EXPOSURE BARRIER (COVER)
- PLANT 6

- NOTES:
1. ALL SOIL SAMPLES SHOWN COLLECTED PRIOR TO JULY 2012.
 2. "ADJUSTED" PSIC REFERS TO GENERIC PSIC MODIFIED FOR A 100-ACRE SOURCE AREA.
 3. COORDINATE SYSTEM IS IN NAD_1983_StatePlane_Michigan_South_FIPS_2113_Feet_Intl



RACER TRUST
PLANT 6
LANSING, MICHIGAN

AREA 5-6 EXPOSURE BARRIER

Soil Corrective Measures Work Plan
RACER Trust Plant 6 – Lansing, Michigan

TABLES



Table 1 - Soil Exceedances Summary
Plant 6 Soil Corrective Measures Work Plan
RACER Trust Plant 6, Lansing, Michigan

Location	Area	Depth (feet bgs)	Compound	2012 Criteria			Draft 2017 Criteria			Result (µg/kg)
				DC Criteria (µg/kg)	Adjusted PSIC- 100 acres (µg/kg)	Final Adjusted PSIC [a] (µg/kg)	DC Criteria (µg/kg)	Adjusted PSIC - 100 Acres (µg/kg)	Final Adjusted PSIC [a] (µg/kg)	
E-16	Area 5-6	4 - 6	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	1.29E+06
E-17	Area 5-6	4 - 6	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	1.48E+06
E-23	Area 5-6	0 - 2	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	8.29E+05
E-25	Area 5-6	0 - 2	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	4.03E+06
E-27	Area 5-6	0 - 2	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	3.24E+06
E-34A	Area 5-6	7.5	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	1.20E+06
SB-A5.6-NP224	Area 5-6	1 - 2	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	1.54E+06
SB-A5.6-NP224	Area 5-6	6 - 7	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	1.53E+07
SB-A5.6-NU227	Area 5-6	0.5 - 1	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	1.86E+06
VAP-A5.6-NR227	Area 5-6	1 - 2	Lead	9.00E+05	1.89E+07	4.40E+07 [b]	7.60E+05	4.92E+06	7.92E+06	3.55E+06
SB-A7-SX206	Area 7	0 - 1	Benzo(a)pyrene	8.00E+03	8.17E+05	1.90E+06 [b]	4.10E+04	4.10E+04	1.00E+05 [b]	1.00E+04
B-96-B	Area 7	9 - 11	Total Xylenes	1.50E+05	5.59E+10	1.30E+11 [b]	1.00E+08	6.97E+09	1.7 E+10 [b]	2.99E+05
SB-A5.7-MW223	Area 5-7	1 - 2	Cobalt	9.00E+06	2.54E+06	5.90E+06 [b]	7.40E+05	1.35E+05	3.30E+05 [b]	1.57E+05
SB-A5.7-MY227	Area 5-7	4 - 5	Vanadium	5.50E+06	ID	ID	3.30E+04	3.16E+06	7.70E+06 [b]	4.54E+04
SB-A5.6-NX232	Area 5-6	1 - 2	Manganese	9.00E+07	6.45E+05	9.90E+05	3.20E+07	9.43E+06	1.52E+07	6.96E+05
SA11-1	Area 5-8	3 - 5	Manganese	9.00E+07	6.45E+05	9.90E+05	3.20E+07	9.43E+06	1.52E+07	6.71E+05
SA11-5	Area 5-8	0.7 - 2.7	Manganese	9.00E+07	6.45E+05	9.90E+05	3.20E+07	9.43E+06	1.52E+07	1.18E+06
SA7-7	Area 10	9 - 11	Manganese	9.00E+07	6.45E+05	9.90E+05	3.20E+07	9.43E+06	1.52E+07	6.55E+05

Notes

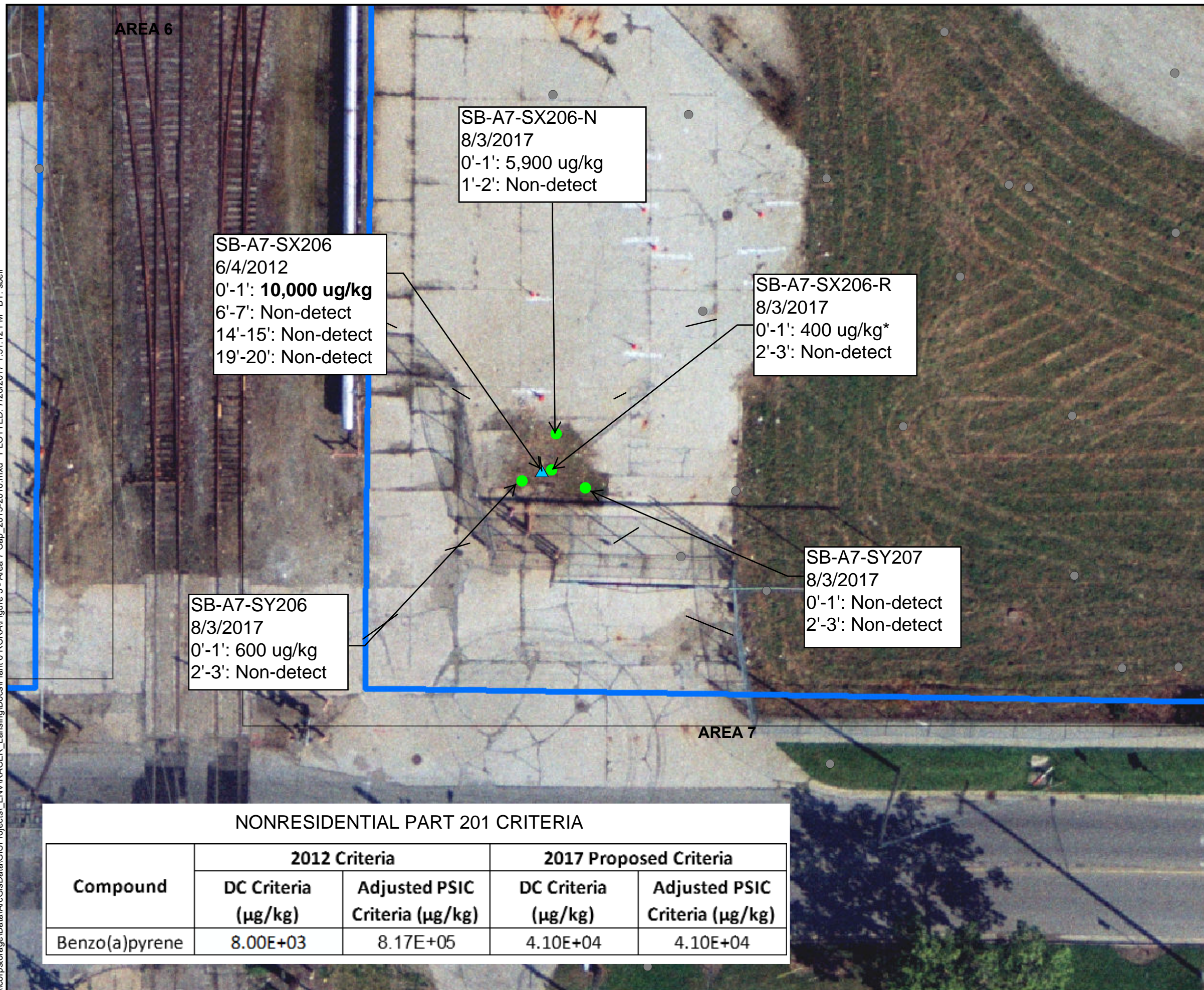
Result exceeds highlighted criteria
DC = Michigan Part 201 Non-Residential Soil Direct Contact Criteria
PSIC = Michigan Part 201 Particulate Soil Inhalation Criteria
bgs = below ground surface
ID = insufficient data to develop a criterion
µg/kg = micrograms per kilogram
[a] based on a 5-acre source area, unless otherwise noted
[b] based on a 1/2-acre source area

Soil Corrective Measures Work Plan
RACER Trust Plant 6 – Lansing, Michigan

ATTACHMENT 1
Area 7 Investigation Results



CITY: Novi DIV: ENV DB: TRY PIC: PM: TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\corpstorage\data\ArcGisData\GISProjects\ENVIRACER_Lansing\Docs\Plant 6 RCRA\Figure 3 - Area 7 Cap_2013-2016.mxd PLOTTED: 7/26/2017 1:31:12 PM BY: shell



Attachment 1, Table 1 - Area 7 Polycyclic Aromatic Hydrocarbons Delineation Samples
Plant 6 Soil Corrective Measures Work Plan
RACER Trust Plant 6, Lansing, Michigan

Constituent	Units	TEF	2012		Draft 2017		Location ID: Sample Depth (feet): Date Collected:	SB-A7-SX206-R	SB-A7-SX206-R-dup	SB-A7-SX206-R	SB-A7-SY206	SB-A7-SY206	SB-A7-SX206-N	SB-A7-SX206-N	SB-A7-SY207	SB-A7-SY207
			Non-Residential		Non-Residential			0-1	0-1	2-3	0-1	2-3	0-1	1-2	0-1	2-3
			Direct Contact	Adjusted PSIC [a]	Direct Contact	Adjusted PSIC [a]		08/03/17	08/03/17	08/03/17	08/03/17	08/03/17	08/03/17	08/03/17	08/03/17	08/03/17
Semivolatile Organics																
Benzo(a)anthracene	µg/kg	0.1	80,000	ID	NA	2.05E+07		<300	<300	<300	500	<300	5,100	<300	<300	<300
Benzo(a)pyrene	µg/kg	1	8,000	1.90E+06	NA	4.10E+04		<300	400	<300	600	<300	5,900	<300	<300	<300
Benzo(b)fluoranthene	µg/kg	0.1	80,000	ID	NA	2.05E+07		500	700	<300	1,200	<300	10,400	<300	500	<300
Benzo(k)fluoranthene	µg/kg	0.01	8.00E+05	ID	NA	2.05E+08		400	600	<300	1,100	<300	9,600	<300	500	<300
Chrysene	µg/kg	0.001	8.00E+06	ID	NA	2.05E+09		<300	<300	<300	600	<300	5,400	<300	<300	<300
Dibenz(a,h)anthracene	µg/kg	1	8,000	ID	NA	2.05E+06		<300	<300	<300	<300	<300	<300	<300	<300	<300
Indeno(1,2,3-cd)pyrene	µg/kg	0.1	80,000	ID	NA	2.05E+07		<300	<300	<300	400	<300	2,800	<300	<300	<300
Benzo(a)pyrene TEQ [b,c]	µg/kg	NA	NA	NA	41,000	NA		384.15	656.15	< 346.65	971.6	< 346.65	7981.4	< 346.65	385.15	< 346.65

Notes:
All values are in micrograms per kilogram (µg/kg).
Bold values are detected concentrations.
ID = insufficient data to develop a criterion.
NA = not applicable.

[a] Adjusted Particulate Soil Inhalation Criteria (PSIC) are based on a 100-acre source area.
[b] The benzo(a)pyrene toxic equivalents (TEQ) was calculated by multiplying the detected concentration, or 1/2 the reporting limit for non-detects, of each carcinogenic polycyclic aromatic hydrocarbon (PAH) by its benzo(a)pyrene toxic equivalency factor (TEF) and summed for the total benzo(a)pyrene TEQ.
[c] The benzo(a)pyrene TEQ is compared to the proposed 2017 non-residential direct contact (DC) criterion of 41,000 µg/kg.



Analytical Laboratory Report

Report ID: S82808.01(01)
Generated on 08/07/2017

Report to

Attention: Alex Villhauer
Arcadis
300 S. Washington Square
Suite 315
Lansing, MI 48933

Phone: 616-780-3277 FAX: 248-994-2241
Email: alex.villhauer@arcadis.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S82808.01-S82808.11
Project: Racer Lansing Plant 6 / B0064481.2017
Collected Date: 08/03/2017
Submitted Date/Time: 08/03/2017 15:31
Sampled by: Alex Villhauer
P.O. #: B0064481.2017

Table of Contents

Cover Page (Page 1)
General Report Notes (Page 2)
Report Narrative (Page 2)
Laboratory Certifications (Page 3)
Qualifier Descriptions (Page 3)
Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

A handwritten signature in black ink, reading "Maya Murshak".

Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods



Analytical Laboratory Report

Method Summary

Method	Version
SM2540B	Standard Method 2540 B 20th Edition
SW3550C	SW 846 Method 3550C Revision 3 February 2007
SW8270D	SW 846 Method 8270D Revision 4 February 2007



Analytical Laboratory Report

Sample Summary (11 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S82808.01	DUP-01_080317	Soil	08/03/17 00:01
S82808.02	SB-A7-SX206-R_0-1	Soil	08/03/17 11:40
S82808.03	SB-A7-SX206-R_2-3	Soil	08/03/17 11:55
S82808.04	SB-A7-SY206_0-1	Soil	08/03/17 12:50
S82808.05	SB-A7-SY206_2-3	Soil	08/03/17 13:00
S82808.06	SB-A7-SY206_2-3 MS	Soil	08/03/17 13:00
S82808.07	SB-A7-SY206_2-3 MSD	Soil	08/03/17 13:00
S82808.08	SB-A7-SX206-N_0-1	Soil	08/03/17 13:55
S82808.09	SB-A7-SX206-N_1-2	Soil	08/03/17 14:00
S82808.10	SB-A7-SY207_0-1	Soil	08/03/17 14:30
S82808.11	SB-A7-SY207_2-3	Soil	08/03/17 14:35



Analytical Laboratory Report

Lab Sample ID: S82808.01

Sample Tag: DUP-01_080317

Collected Date/Time: 08/03/2017 00:01

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	97	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles

Polynuclear Aromatics

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	56-55-3	
Benzo(a)pyrene	400	ug/kg	300	SW8270D	08/05/17 05:14	PL	50-32-8	
Benzo(b)fluoranthene	700	ug/kg	300	SW8270D	08/05/17 05:14	PL	205-99-2	p
Benzo(k)fluoranthene	600	ug/kg	300	SW8270D	08/05/17 05:14	PL	207-08-9	p
Benzo(ghi)perylene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	191-24-2	
Chrysene	300	ug/kg	300	SW8270D	08/05/17 05:14	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	53-70-3	
Fluoranthene	600	ug/kg	300	SW8270D	08/05/17 05:14	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	91-20-3	
Phenanthrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	85-01-8	
Pyrene	500	ug/kg	300	SW8270D	08/05/17 05:14	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:14	PL	90-12-0	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.



Analytical Laboratory Report

Lab Sample ID: S82808.02

Sample Tag: SB-A7-SX206-R_0-1

Collected Date/Time: 08/03/2017 11:40

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	98	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles**Polynuclear Aromatics**

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	56-55-3	
Benzo(a)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	50-32-8	
Benzo(b)fluoranthene	500	ug/kg	300	SW8270D	08/05/17 05:33	PL	205-99-2	p
Benzo(k)fluoranthene	400	ug/kg	300	SW8270D	08/05/17 05:33	PL	207-08-9	p
Benzo(ghi)perylene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	191-24-2	
Chrysene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	53-70-3	
Fluoranthene	400	ug/kg	300	SW8270D	08/05/17 05:33	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	91-20-3	
Phenanthrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	85-01-8	
Pyrene	300	ug/kg	300	SW8270D	08/05/17 05:33	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:33	PL	90-12-0	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.



Analytical Laboratory Report

Lab Sample ID: S82808.03

Sample Tag: SB-A7-SX206-R_2-3

Collected Date/Time: 08/03/2017 11:55

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	86	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles

Polynuclear Aromatics

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	56-55-3	
Benzo(a)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	50-32-8	
Benzo(b)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	207-08-9	
Benzo(ghi)perylene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	191-24-2	
Chrysene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	53-70-3	
Fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	91-20-3	
Phenanthrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	85-01-8	
Pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 05:52	PL	90-12-0	



Analytical Laboratory Report

Lab Sample ID: S82808.04

Sample Tag: SB-A7-SY206_0-1

Collected Date/Time: 08/03/2017 12:50

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	94	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles

Polynuclear Aromatics

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	120-12-7	
Benzo(a)anthracene	500	ug/kg	300	SW8270D	08/05/17 06:11	PL	56-55-3	
Benzo(a)pyrene	600	ug/kg	300	SW8270D	08/05/17 06:11	PL	50-32-8	
Benzo(b)fluoranthene	1,200	ug/kg	300	SW8270D	08/05/17 06:11	PL	205-99-2	p
Benzo(k)fluoranthene	1,100	ug/kg	300	SW8270D	08/05/17 06:11	PL	207-08-9	p
Benzo(ghi)perylene	400	ug/kg	300	SW8270D	08/05/17 06:11	PL	191-24-2	
Chrysene	600	ug/kg	300	SW8270D	08/05/17 06:11	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	53-70-3	
Fluoranthene	1,100	ug/kg	300	SW8270D	08/05/17 06:11	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	400	ug/kg	300	SW8270D	08/05/17 06:11	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	91-20-3	
Phenanthrene	500	ug/kg	300	SW8270D	08/05/17 06:11	PL	85-01-8	
Pyrene	900	ug/kg	300	SW8270D	08/05/17 06:11	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 06:11	PL	90-12-0	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.



Analytical Laboratory Report

Lab Sample ID: S82808.05

Sample Tag: SB-A7-SY206_2-3

Collected Date/Time: 08/03/2017 13:00

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	98	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles

Polynuclear Aromatics

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	56-55-3	
Benzo(a)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	50-32-8	
Benzo(b)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	207-08-9	
Benzo(ghi)perylene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	191-24-2	
Chrysene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	53-70-3	
Fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	91-20-3	
Phenanthrene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	85-01-8	
Pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 03:38	PL	90-12-0	



Analytical Laboratory Report

Lab Sample ID: S82808.06

Sample Tag: SB-A7-SY206_2-3 MS

Collected Date/Time: 08/03/2017 13:00

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	96	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles**Polynuclear Aromatics**

Acenaphthene	1,500	ug/kg	300	SW8270D	08/05/17 03:57	PL	83-32-9	1
Acenaphthylene	1,600	ug/kg	300	SW8270D	08/05/17 03:57	PL	208-96-8	1
Anthracene	1,500	ug/kg	300	SW8270D	08/05/17 03:57	PL	120-12-7	1
Benzo(a)anthracene	1,600	ug/kg	300	SW8270D	08/05/17 03:57	PL	56-55-3	1
Benzo(a)pyrene	1,800	ug/kg	300	SW8270D	08/05/17 03:57	PL	50-32-8	1
Benzo(b)fluoranthene	2,000	ug/kg	300	SW8270D	08/05/17 03:57	PL	205-99-2	1
Benzo(k)fluoranthene	1,500	ug/kg	300	SW8270D	08/05/17 03:57	PL	207-08-9	1
Benzo(ghi)perylene	1,500	ug/kg	300	SW8270D	08/05/17 03:57	PL	191-24-2	1
Chrysene	1,600	ug/kg	300	SW8270D	08/05/17 03:57	PL	218-01-9	1
Dibenzo(ah)anthracene	1,600	ug/kg	300	SW8270D	08/05/17 03:57	PL	53-70-3	1
Fluoranthene	1,700	ug/kg	300	SW8270D	08/05/17 03:57	PL	206-44-0	1
Fluorene	1,500	ug/kg	300	SW8270D	08/05/17 03:57	PL	86-73-7	1
Indeno(1,2,3-cd)pyrene	1,600	ug/kg	300	SW8270D	08/05/17 03:57	PL	193-39-5	1
Naphthalene	1,300	ug/kg	300	SW8270D	08/05/17 03:57	PL	91-20-3	1
Phenanthrene	1,500	ug/kg	300	SW8270D	08/05/17 03:57	PL	85-01-8	1
Pyrene	1,600	ug/kg	300	SW8270D	08/05/17 03:57	PL	129-00-0	1
2-Methylnaphthalene	1,300	ug/kg	300	SW8270D	08/05/17 03:57	PL	91-57-6	1
1-Methylnaphthalene	1,400	ug/kg	300	SW8270D	08/05/17 03:57	PL	90-12-0	1

1-Sample spiked at 1.7 mg/kg



Analytical Laboratory Report

Lab Sample ID: S82808.07

Sample Tag: SB-A7-SY206_2-3 MSD

Collected Date/Time: 08/03/2017 13:00

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	97	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles**Polynuclear Aromatics**

Acenaphthene	1,400	ug/kg	300	SW8270D	08/05/17 04:17	PL	83-32-9	1
Acenaphthylene	1,600	ug/kg	300	SW8270D	08/05/17 04:17	PL	208-96-8	1
Anthracene	1,400	ug/kg	300	SW8270D	08/05/17 04:17	PL	120-12-7	1
Benzo(a)anthracene	1,500	ug/kg	300	SW8270D	08/05/17 04:17	PL	56-55-3	1
Benzo(a)pyrene	1,800	ug/kg	300	SW8270D	08/05/17 04:17	PL	50-32-8	1
Benzo(b)fluoranthene	1,900	ug/kg	300	SW8270D	08/05/17 04:17	PL	205-99-2	1
Benzo(k)fluoranthene	1,500	ug/kg	300	SW8270D	08/05/17 04:17	PL	207-08-9	1
Benzo(ghi)perylene	1,500	ug/kg	300	SW8270D	08/05/17 04:17	PL	191-24-2	1
Chrysene	1,600	ug/kg	300	SW8270D	08/05/17 04:17	PL	218-01-9	1
Dibenzo(ah)anthracene	1,500	ug/kg	300	SW8270D	08/05/17 04:17	PL	53-70-3	1
Fluoranthene	1,600	ug/kg	300	SW8270D	08/05/17 04:17	PL	206-44-0	1
Fluorene	1,500	ug/kg	300	SW8270D	08/05/17 04:17	PL	86-73-7	1
Indeno(1,2,3-cd)pyrene	1,600	ug/kg	300	SW8270D	08/05/17 04:17	PL	193-39-5	1
Naphthalene	1,300	ug/kg	300	SW8270D	08/05/17 04:17	PL	91-20-3	1
Phenanthrene	1,500	ug/kg	300	SW8270D	08/05/17 04:17	PL	85-01-8	1
Pyrene	1,600	ug/kg	300	SW8270D	08/05/17 04:17	PL	129-00-0	1
2-Methylnaphthalene	1,300	ug/kg	300	SW8270D	08/05/17 04:17	PL	91-57-6	1
1-Methylnaphthalene	1,400	ug/kg	300	SW8270D	08/05/17 04:17	PL	90-12-0	1

1-Sample spiked at 1.7 mg/kg



Analytical Laboratory Report

Lab Sample ID: S82808.08

Sample Tag: SB-A7-SX206-N_0-1

Collected Date/Time: 08/03/2017 13:55

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	94	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles**Polynuclear Aromatics**

Acenaphthene	800	ug/kg	300	SW8270D	08/05/17 07:08	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 07:08	PL	208-96-8	
Anthracene	1,600	ug/kg	300	SW8270D	08/05/17 07:08	PL	120-12-7	
Benzo(a)anthracene	5,100	ug/kg	300	SW8270D	08/05/17 07:08	PL	56-55-3	
Benzo(a)pyrene	5,900	ug/kg	300	SW8270D	08/05/17 07:08	PL	50-32-8	
Benzo(b)fluoranthene	10,400	ug/kg	300	SW8270D	08/05/17 07:08	PL	205-99-2	p
Benzo(k)fluoranthene	9,600	ug/kg	300	SW8270D	08/05/17 07:08	PL	207-08-9	p
Benzo(ghi)perylene	2,900	ug/kg	300	SW8270D	08/05/17 07:08	PL	191-24-2	
Chrysene	5,400	ug/kg	300	SW8270D	08/05/17 07:08	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 07:08	PL	53-70-3	
Fluoranthene	11,500	ug/kg	300	SW8270D	08/05/17 07:08	PL	206-44-0	
Fluorene	600	ug/kg	300	SW8270D	08/05/17 07:08	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	2,800	ug/kg	300	SW8270D	08/05/17 07:08	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 07:08	PL	91-20-3	
Phenanthrene	7,200	ug/kg	300	SW8270D	08/05/17 07:08	PL	85-01-8	
Pyrene	9,800	ug/kg	300	SW8270D	08/05/17 07:08	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 07:08	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 07:08	PL	90-12-0	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.



Analytical Laboratory Report

Lab Sample ID: S82808.09

Sample Tag: SB-A7-SX206-N_1-2

Collected Date/Time: 08/03/2017 14:00

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	95	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles

Polynuclear Aromatics

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	56-55-3	
Benzo(a)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	50-32-8	
Benzo(b)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	207-08-9	
Benzo(ghi)perylene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	191-24-2	
Chrysene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	53-70-3	
Fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	91-20-3	
Phenanthrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	85-01-8	
Pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 04:36	PL	90-12-0	



Analytical Laboratory Report

Lab Sample ID: S82808.10

Sample Tag: SB-A7-SY207_0-1

Collected Date/Time: 08/03/2017 14:30

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	96	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles

Polynuclear Aromatics

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	56-55-3	
Benzo(a)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	50-32-8	
Benzo(b)fluoranthene	500	ug/kg	300	SW8270D	08/05/17 06:30	PL	205-99-2	p
Benzo(k)fluoranthene	500	ug/kg	300	SW8270D	08/05/17 06:30	PL	207-08-9	p
Benzo(ghi)perylene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	191-24-2	
Chrysene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	53-70-3	
Fluoranthene	500	ug/kg	300	SW8270D	08/05/17 06:30	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	91-20-3	
Phenanthrene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	85-01-8	
Pyrene	400	ug/kg	300	SW8270D	08/05/17 06:30	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 06:30	PL	90-12-0	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.



Analytical Laboratory Report

Lab Sample ID: S82808.11

Sample Tag: SB-A7-SY207_2-3

Collected Date/Time: 08/03/2017 14:35

Matrix: Soil

COC Reference: 109391

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	26.5	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Tech	CAS #	Flags
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Extraction / Prep.

PNA Extraction	Completed			SW3550C	08/04/17 19:33	EMR		
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Inorganics

Total Solids*	95	%	1	SM2540B	08/04/17 09:50	JBL		
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Organics - Semi-Volatiles

Polynuclear Aromatics

Acenaphthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	208-96-8	
Anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	56-55-3	
Benzo(a)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	50-32-8	
Benzo(b)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	207-08-9	
Benzo(ghi)perylene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	191-24-2	
Chrysene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	218-01-9	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	53-70-3	
Fluoranthene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	206-44-0	
Fluorene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	193-39-5	
Naphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	91-20-3	
Phenanthrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	85-01-8	
Pyrene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	129-00-0	
2-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	91-57-6	
1-Methylnaphthalene	Not detected	ug/kg	300	SW8270D	08/05/17 04:55	PL	90-12-0	

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Alex Villhaver			
COMPANY Arccdis			
ADDRESS 300 S. Washington Square, Suite 315			
CITY Lansing		STATE MI	ZIP CODE 48933
PHONE NO. 517-324-5030		FAX NO.	PO. NO. 60064481.2017.00201
E-MAIL ADDRESS Alex.vilhaver@arccdis.com/cc: extractum		QUOTE NO.	

CONTACT NAME		<input checked="" type="checkbox"/> SAME	
COMPANY			
ADDRESS			
CITY		STATE	ZIP CODE
PHONE NO.		E-MAIL ADDRESS	

PROJECT NO./NAME: RACER Lensing Plant 6 / BOOG4481.2017 SAMPLER(S) - PLEASE PRINT/SIGN NAME: Alex Villalobos

TURNAROUND TIME REQUIRED: ☐ 1 DAY ☒ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX	GW=GROUNDWATER	WW=WASTEWATER	S=SOIL	L=LIQUID	SD=SOLID
CODE:	SL=SLUDGE	DW=DRINKING WATER	O=OIL	WP=WPIE	A=AIR
					W=WASTE

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR 2017		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	<input type="checkbox"/> Other _____ Special Instructions	
	DATE	TIME												
82808.01	8/3	—	DUP-01-080317	S	1	1								
.02		11:40	SB-A7-SX206-R-0-1		1	1								
.03		11:55	SB-A7-SX206-R-2-3		1	1								
.04		12:50	SB-A7-SX206-0-1		1	1								
		13:00	SB-A7-SX206-0-1											
.05/06/07		13:00	SB-A7-SX206-2-3		3	3								
.08		13:55	SB-A7-SX206-N-0-1		1	1								
.09		14:00	SB-A7-SX206-N-1-2		1	1								
.10		14:30	SB-A7-SX207-0-1		1	1								
.11		14:35	SB-A7-SX207-2-3		1	1								

Certifications

☐ OHIO VAP ☐ Drinking Water

☐ DoD ☐ NPDES

Project Locations

☐ Detroit ☐ New York

☐ Other _____

Special Instructions

RELINQUISHED BY:	<i>Call Call 2/17/17</i>	DATE	TIME
SIGNATURE/ORGANIZATION		<i>8/3/17</i>	
RECEIVED BY:	<i>Sam Grish</i>	DATE	TIME
SIGNATURE/ORGANIZATION		<i>8/3/17</i>	<i>1531</i>
RELINQUISHED BY:		DATE	TIME
SIGNATURE/ORGANIZATION			
RECEIVED BY:		DATE	TIME
SIGNATURE/ORGANIZATION			

RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE	TIME
SEAL NO.	SEAL INTACT YES <input type="checkbox"/> NO <input type="checkbox"/>	INITIALS	NOTES:	TEMP. ON ARRIVAL <u>26.5</u>
SEAL NO.	SEAL INTACT YES <input type="checkbox"/> NO <input type="checkbox"/>	INITIALS		

Soil Corrective Measures Work Plan
RACER Trust Plant 6 – Lansing, Michigan

ATTACHMENT 2

Exposure Barrier Inspection Log Sheet



MAINTENANCE OF EXPOSURE BARRIERS INSPECTION LOG SHEET RACER Trust Plant 6 – Lansing, Michigan

DATE: _____

TIME: _____

Inspection		
Is the Surface Cover Consistent With Existing Conditions?		
Exposure Barrier	Condition Satisfactory (X)	Condition Unsatisfactory (X)
Area 5-6 Exposure Barrier	<input type="checkbox"/>	<input type="checkbox"/>

Comments*:

Print Name (Inspector): _____

Inspector's Signature: _____

***Comments and photos attached**

MAINTENANCE OF EXPOSURE BARRIERS INSPECTION LOG SHEET RACER Trust Plant 6 – Lansing, Michigan

Exposure Barrier	Groundcover Condition (Describe weathering, erosion, settling, water ponding, vegetation growth, etc.)	Overall Condition (Good / Fair / Poor)	Photo Notes (Attach labelled photographs)
Area 5-6 Exposure Barrier			1. 2. 3. 4.

Based on the above observations, are any corrective actions (i.e., repairs) required? _____
