FINAL
TRIP REPORT
FOR THE
STONEY CREEK TECHNOLOGIES SITE
TRAINER, DELAWARE COUNTY, PENNSYLVANIA

Prepared for

U.S. Environmental Protection Agency Region III
Hazardous Site Cleanup Division
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Appendices are provided on disk with a pdf of the entire document.

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ACRONYMS

µg/Kg	micrograms per kilogram
µg/L	micrograms per liter
AOC	Area of Concern
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
FID	Flame Ionization Detector
GRO	Gasoline Range Organics
IN BGS	inches below ground surface
NPL	National Priority List
NS	not sampled
OSC	on-scene coordinator
PCB	Poly Chlorinated Biphenyl
PEST	Pesticide
PPM	parts per million
QAPP	Quality Assurance Project Plan
QC	quality control
RSL	Regional Screening Level
SACI	Saturated Atmosphere Corrosion Inhibitor
SOP	Standard Operating Procedure
START	Superfund Technical Assessment and Response Team
SVOC	Semi- Volatile Organic Compound
TCL/TAL	Target Compound and Target Analyte List
TDD	Technical Direction Document
TPH-DRO/GRO	Total Petroleum Hydrocarbons-Diesel Range Organics/Gasoline Range Organics
VOC	Volatile Organic Compounds
WESTON®	Weston Solutions, Inc.
WWTP	Waste Water Treatment Plant

TRIP REPORT

Stoney Creek Technologies Site
Trainer, Delaware County, Pennsylvania

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1. INTRODUCTION

Under Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. [redacted], U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to:

- Conduct a site wide subsurface soil characterization and sampling at the Stoney Creek Technologies Site ("the Site") in Trainer, Delaware County, Pennsylvania using a direct-push technology rig (e.g., Geoprobe®) in order to visually screen and collect samples at multiple depths below ground surface.
- Conduct site wide drainage characterization sampling by collecting water samples from specified trench locations throughout the Site.

The objective of these sampling events was to collect sub-subsurface soil samples along with site surface water data so that EPA can evaluate the potential threat to public health and/or the environment.

This trip report provides site background in **Section 2.0**, describes site activities in **Section 3.0**, and summarizes analytical results in **Section 4.0**. All references cited in this report are listed after the text.

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2. BACKGROUND

This section describes the site location, presents a description and history of the Site, and summarizes previous site investigations.

2.1 SITE LOCATION

The Site is located in a mixed industrial and residential area of Trainer, Delaware County, Pennsylvania [Latitude: 39.8300000; Longitude: -75.3975000, (**Figure 1**)]. The Site abuts an active railroad line that traffics freight and passenger trains. Residences are located directly across the street from the Site. Fisher Tank borders the Site to the East and Lou's Auto Salvage is to the West.

2.2 SITE DESCRIPTION AND HISTORY

The Site includes a chemical manufacturing facility consisting of about 230 tanks, several buildings, a laboratory, a wastewater treatment facility, and many processing vessels, equipment items, systems, and pipelines which are used in, or are related to, the chemical manufacturing processes. Chemicals at the facility include various petroleum mixtures, Oleum and sulfuric acid, caustics, methanol, heptane, and mineral spirits.

In February 2009, EPA initiated response actions and has been actively disposing of the remaining chemical inventory. EPA completed the disposal of bulk liquid chemicals posing a flammable threat in June 2010, and completed the disposal of bulk acid chemicals in January 2010.

As part of the current removal action, EPA contractors have been consolidating solvent-containing materials on the Site by transferring the chemical inventory between tanks. EPA contractors also have been conducting line-clearing operations of pipelines, pumps, and other equipment that are located throughout the Site.

Untreated stormwater and liquids are present in the trenches, drains, and process areas influent to the on-Site wastewater treatment plant. Stormwater runoff is collected by a water collection and

treatment system that discharges to Stoney Creek. Stoney Creek flows to the south along the Site's western boundary and empties into the Delaware River. Based on monitoring data collected by EPA in relation to the Site, groundwater is expected to flow southwest towards Stoney Creek.

EPA Pre-Remedial personnel is currently evaluating the Site for possible National Priority List (NPL) listing.

2.3 CURRENT SITE CONDITIONS

The Site consists of mostly concrete or asphalt ground surfaces. The plant structures are generally intact, though the physical integrity is rapidly deteriorating. Approximately 230 tanks are on site, many of which still contain unused material and waste products, though steps are being taken to remove existing useable inventory. Tanks and lines are currently being emptied and the contents are being drummed for disposal to eliminate the risk of further release. The waste water treatment plant (WWTP) has been made operational and the outfall into Stoney Creek is continually monitored. Oily material continues to bubble up through cracks in the pavement, especially in warmer weather. Material that has spilled from tanks and process equipment has been observed throughout various surfaces of the plant. In warmer weather, the material can melt and drip, posing a potential environmental threat. Also oily sheens and odors are present in areas that fill with groundwater at the WWTP.

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3. SITE ACTIVITIES

This section describes the sample collection and sample handling activities associated with the October 2010 subsurface soil sampling and the December 2010 surface water sampling conducted at the Site. The original source of contamination is currently being eliminated through an ongoing removal action, thereby reducing the quantity of contamination available for potential migration. Removal actions include cleaning paved and concrete surfaces, emptying tanks, clearing lines, cleaning and clearing process equipment, cleaning the drainage system, and operating the existing WWTP to ensure that contaminants do not leave the Site.

3.1 SUBSURFACE SOIL SAMPLE COLLECTION

On 21-26 October 2010, WESTON completed soil characterizations of 56 direct push Geoprobe borings located throughout the Site (**Figure 2)** in order to visually screen and collect samples at multiple depths below ground surface. In addition to a visual screening, borings were analyzed every 6 inches with a TVA-1000B Flame Ionization Detector (FID) for vapor readings and recorded for each soil boring. At the discretion of the on-scene coordinator (OSC), grab samples were collected directly at selected intervals where staining and/or elevated vapor readings were observed. Locations in which samples were collected for analysis are depicted in (**Figure 3).** Twenty samples were collected for Total Petroleum Hydrocarbons-Diesel Range Organics/Gasoline Range Organics (TPH-DRO/GRO) and methanol. Seven samples were also analyzed for a full suite Target Compound and Target Analyte Lists (TCL/TALs): Volatile Organic Compounds (VOCs), Semi- Volatile Organic Compounds (SVOCs), Pesticides (PEST), Poly Chlorinated Biphenyls (PCBs), and total metals.

Borings were contained in acetate sleeves and were documented with soil boring logs and digital photographs. All samples were collected in accordance with WESTON's Field Sampling Plan dated 24 September 2010, the EPA Region 3 Environmental Response Team Standard Operating Procedures (SOP), and the START-4 Program-Wide Uniform Federal Policy Act Quality Assurance Project Plan (QAPP) (WESTON, 2010). **Table 1** describes the sample location, FID

readings, sample depth interval, and laboratory analysis. A photo log of subsurface soil sampling activities and soil boring logs can be found in **Appendix A**.

Table 1 Subsurface Soil Sampling Summary

Boring Identifier	Process Area	Location Description	FID (ppm)	Sample Interval (in-bgs)	Analysis
SCT-101910- SB-15-001	LimOH	S of Drum Storage Pad	6.5-14.4	NS	NS
SCT-101910-SB-1-002	LimOH	S of Gravel Pad	74-1,098	16-30	TPH-DRO/GRO, Methanol
SCT-101910-SB-1-003	LimOH	Center of Gravel Pad	0.4-7	NS	NS
SCT-101910-SB-8-004	LimOH	Mag Blvd by T610	1.5-238	NS	NS
SCT-101910-SB-2-005	LimOH	Oleum Blvd by RR	36.24-124	NS	NS
SCT-101910-SB-2-006	Mag	Oleum Blvd by RR	39.5-310	NS	NS
SCT-101910-SB-2-007	Mag	N of Oleum Tanks by T448	16-170	3-14	TPH-DRO/GRO, Methanol
SCT-101910-SB-2-008	Mag	NE of Oleum Tanks by T437	1,200-2.4%	30-55	TAL Full Suite, TPH-DRO/GRO, Methanol
SCT-102010-SB-2-009	LimOH	Gravel Area b/t T528 and T539	80-1900	6-24	TAL Full Suite
SCT-102010-SB-2-10	LimOH	Gravel Area b/t T528 and T540	30-500	4-12 and 23-30	TPH-DRO/GRO, Methanol
SCT-102010-SB-2-011	Mag	Old Tank Pad by Filter House	15-500	NS	NS
SCT-102010-SB-2-012	Mag	Between T434 and T436	100-6,200	4-12	TPH-DRO/GRO, Methanol
SCT-102010-SB-2-013	Mag	Between T471 and Filter House	30-1600	NS	NS
SCT-102010-SB-2-014	Mag	Between T447 and T495	25-2,900	NS	NS
SCT-102010-SB-2-015	Mag	Between T408 and T423	350-6000	74-80	TPH-DRO/GRO, Methanol
SCT-102010-SB-2-016	Mag	Between T414 and Towers	50-3,800	3-63	TPH-DRO/GRO, Methanol
SCT-102110-SB-3-017A	Mag	Between T441 and T491	54-3.4%	12-28	TPH-DRO/GRO, Methanol
SCT-102110-SB-3-017B	Mag	Between T441 and T491	6200-3.4%	78-108	DRO/GRO, Methanol
SCT-102110-SB-2-018	Mag	Between T127 and T440	100-2.4%	3-35	TAL Full Suite
SCT-102110-SB-2-019	Mag	NW corner of engineering lab (by	50-315	NS	NS

[redacted]

Boring Identifier	Process Area	Location Description	FID (ppm)	Sample Interval (in-bgs)	Analysis
		fence) under gravel			
SCT-102110-SB-2-020	Mag	NW corner of warehouse	2,000-6,100	18-36	TPH-DRO/GRO, Methanol
SCT-102110-SB-2-021	SACI	Between T551 and T552	540-1.7%	12-36	TPH-DRO/GRO, Methanol
SCT-102210-SB-3-022	SACI	NW of T955 near fence	420-3,500	14-36	TPH-DRO/GRO, Methanol
SCT-102210-SB-3-023	SACI	Road between T551 and pallet storage area/ blue oven	4-200	NS	NS
SCT-102210-SB-2-024	Mag	Between T411 and T422, next to fence	2,350-3,350	6-32	TPH-DRO/GRO, Methanol
SCT-102210-SB-2-025	SACI	Between T420 and T456	165-1,330	NS	NS
SCT-102210-SB-3-026	SACI	South of T206	110-1,650	NS	NS
SCT-102210-SB-3-027	SACI	In front of T205	120-2550	3-17	TPH-DRO/GRO, Methanol
SCT-102510-SB-3-028	SACI	Between T552 and T505	1.35%-3.0%	6-30	TAL Full Suite
SCT-102510-SB-3-029A	SACI	Between T507 and T256	1,650-6,050	6-24	TPH-DRO/GRO
SCT-102510-SB-3-029B	SACI	Between T507 and T256	3-14	114-132	TPH-DRO/GRO
SCT-102510-SB-3-030	SACI	Between T204 and T956	38-350	NS	NS
SCT-102510-SB-3-031	SACI	Between T220 and T252	195-3,400	0-16	TPH-DRO/GRO
SCT-102510-SB-3-032	SACI	Between T955 and Blue oven	4-25	NS	NS
SCT-102510-SB-3-033	SACI	90 degree angle with T551 and T552, in middle of road	80-8,600	NS	NS
SCT-102610-SB-3-034	SACI	Middle of road off corner of platform	25-121	NS	NS
SCT-102610-SB-3-035	SACI	Loft in front of Gate 5	17-1,060	NS	NS
SCT-102610-SB-14-036	SACI	In front of Fire Pump House on edge of gravel	1-990	NS	NS
SCT-102610-SB-14-037	SACI	In front of D701 off SE corner of garage	87-1,800	NS	NS
SCT-102610-SB-6-038	SACI	SACI area by WWTP North of T701	540-3,900	20-36	TPH-DRO/GRO
SCT-102610-SB-6-039	SACI	90 degree angle with T227 and T253	20-820	NS	NS
SCT-102610-SB-3-040	SACI	15 feet off SW corner of dock	6-1,950	NS	NS

Stoney Creek Technologies Site
Trainer, Delaware County, Pennsylvania

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Boring Identifier	Process Area	Location Description	FID (ppm)	Sample Interval (in-bgs)	Analysis
SCT-102610-SB-24-041	SACI	NW corner of garage	990-1,250	48-60	TAL Full Suite
SCT-102610-SB-6-042	SACI	90 degree angle with T242 and NW corner of Fire Pump House	33-315	NS	NS
SCT-102610-SB-6-043	SACI	Between corners of Fire Pump House and D701 basin	120-1,250	5-20	TPH-DRO/GRO, Methanol
SCT-102710-SB-3-044	SACI	Center of T252/253/254 cluster	Rain	NS	NS
SCT-102710-SB-3-045	SACI	In front of Bekasol Tank	Rain	4-20	TPH-DRO/GRO
SCT-102710-SB-6-046	SACI	Next to safety shower at WWTP	Rain	NS	NS
SCT-102710-SB-6-047	SACI	Next to sulfuric acid pump in front of D701	Rain	NS	NS
SCT-102710-SB-6-048	SACI	Off corner of Fire Pump House next to Gate 5 fence	Rain	NS	NS
SCT-102710-SB-6-049	SACI	Between D701 and Gate 5 corner post	Rain	NS	NS
SCT-102710-SB-6-050	SACI	Between D701 and Gate 5 corner post	Rain	NS	NS
SCT-102710-SB-3-051	SACI	90 degree angle with D701 and corner dock	Rain	NS	NS
SCT-102710-SB-7-052	SACI	Middle of open area between Railroad tracks and garage	Rain	44-64	TPH-DRO/GRO, Methanol
SCT-102710-SB-6-053	SACI	Behind garage between T190 and concrete blocks	Rain	NS	NS
SCT-102710-SB-13-054	SACI	NW corner of T955 near fence	Rain	30-50	TAL Full Suite (RESAMPLE 022)
SCT-102710-SB-19-055	Mag	On main roadway in front of T210	Rain	NS	NS
SCT-102710-SB-19-056	Mag	On main road in front of hose house #1	Rain	NS	NS

Notes:
ppm – parts per million
in bgs – inches below ground surface
NS – not sampled

[redacted]

3.1.1 Subsurface Soil Sample Location

WESTON conducted a total of 56 soil borings throughout the Site, as depicted in **(Table 2).** The highest elevation on site is the east side adjacent to the Fisher Tank facility. The ground surface slopes toward the lowest elevation to the west where the WWTP is located. The process area highest in elevation is LimOH, also known as the Calcium Sulfonate Unit, which extends from the eastern boundary to the road which passes T-105, commonly referred to as "Oleum Blvd". The next process area down-gradient is the Magnesium area, which encompasses the mid-section of the plant between LimOH and the road (commonly referred to as "Mag Blvd."), which runs past the Calcium Warehouse to the railroad tracks. The Saturated Atmosphere Corrosion Inhibitor (SACI) area is lowest in elevation and includes the area between Magnesium and the WWTP. Additionally, within these process areas, areas of concern (AOCs) have been identified by known historic spill locations, suspected spill locations, drum storage areas, and the visual observation of underground product exposed from cracks in the pavement. Sample locations were identified in the field by the OSC, and then surveyed for the presence of underground utilities and Geoprobe accessibility. The descriptions of the Site's process areas are provided below. The number of soil boring and samples collected at each process area can be found in **(Table 3)** and are summarized below:

- **LimOH Area**—Seven soil borings were collected from within the LimOH area on the eastern boarder of the plant. Of these seven soil borings, TPH-DRO/GRO samples were collected from the following locations:

  - SB-002
  - SB-010

Full suite TCL/TAL samples were collected from location SB-009.

- **Magnesium Area—**Sixteen soil borings were collected from within the Magnesium area which encompasses the mid-section of the plant between LimOH and Mag Blvd, which runs past the Calcium Warehouse to the railroad tracks. Acidic tank materials have dissolved many of the concrete structures in this area including portions of the drainage system

allowing contaminants to seep into the soil. TPH-DRO/GRO samples were collected from the following locations:

- SB-007
- SB-008
- SB-012
- SB-015
- SB-016
- SB-017A
- SB-017B
- SB-020
- SB-024

Full suite TCL/TAL samples were collected from the following locations:

- SB-008
- SB-018

- **SACI Area—**A total of 32 soil boring were collected from within the SACI area which encompasses the lowest lying western portion of the plant. Of these borings, ten samples were collected and analyzed for TPH-DRO/GRO samples:

  - SB-021
  - SB-022
  - SB-027
  - SB-029A
  - SB-029B
  - SB-031
  - SB-038
  - SB-043
  - SB-045
  - SB-052

  Full suite TCL/TAL samples were collected from the following locations:

  - SB-028
  - SB-041
  - SB-054

Table 2
Subsurface Soil Sampling Analytical Results for Detected Organic Compounds

	Sample ID →	**SB-02-009**	**SB-02-008**	**SB-02-018**	**SB-03-028**	**SB-03-128**	**SB-24-041**	**SB-03-054**
	Sample Date →	**10/20/2010**	**10/21/2010**	**10/21/2010**	**10/25/2010**	**10/25/2010**	**10/25/2010**	**10/27/2010**
	Media →	**Subsurface Soil**	**Subsurface Soil**	**Subsurface Soil**	**Subsurface Soil**	**Subsurface Soil**	**Subsurface Soil**	**Subsurface Soil**
	Process Area →	**LimOH**	**Magnesium**	**Magnesium**	**SACI**	**SACI**	**SACI**	**SACI**
	Sample Depth →	**6"-24"**	**30"-55"**	**3"-35"**	**6"-30"**	**6"-30"**	**48"-60"**	**30"-50"**
	FID →	**1,900**	**2.40%**	**2.40%**	**3.00%**	**3.00%**	**1,250**	**NS**
	ORNL Industrial Soil RSL* (µg/kg) 1E-06 Cancer Risk							
Volatile Compound (µg/Kg)								
Acetone	6.30E+08 (n)	37	180	87	ND	ND	23	250 J
Carbon Disulfide	3.70E+06 (n)	ND	ND	4.2 J	6.5 J	2.3 J	ND	ND
Methylene chloride	5.30E+04	ND	ND	ND	ND	ND	4.1 B	ND
cis-1,2-Dichloroethene	2.00E+06 (n)	ND	ND	ND	16	9.0	ND	ND
Cyclohexane	2.90E+07 (n)	ND	ND	ND	5600 J	16000 +	2.5 J	8500 +
Benzene	5.40E+04	ND	5.9 L	ND	710 +	870 +	ND	82 L
Trichloroethene	1.40E+04	ND	ND	ND	9.7	10	ND	ND
Methylcyclohexane	No RSL	9.0	71000 + J	58000 + J	21000 + J	12000 + J	4.0 J	16
Toluene	4.50E+07 (n)	ND	28	10 K	61	47	ND	8
Tetrachloroethene	2.60E+03	ND	ND	ND	11	4.8	ND	26
Ethylbenzene	2.70E+04	ND	ND	ND	55	46	8.5	17
o-Xylene	3.00E+06 (n)	ND	69	ND	4700 +	3400 +	ND	95
m,p-Xylene	2.50R+06 (n)	ND	ND	ND	3900 +	3400 +	37	78
Isopropylbenzene	No RSL	ND	ND	ND	130	81	130	82
Semivolatile Compound (µg/Kg)								
Naphthalene	1.80E+04	ND	ND	ND	ND	ND	ND	800 J
2-Methylnaphthalene	4.10E+06 (n)	40 J	770	78 J	950 J	790 J	200 J	1600 J
Dimethylphthalate	No RSL	ND	120 J	50 J	ND	ND	ND	ND
Fluorene	2.20E+07 (n)	40 J	200 J	ND	ND	ND	40 J	ND
N-Nitrosodiphenylamine	3.50E+05	84 J	ND	ND	ND	ND	ND	ND
Phenanthrene	No RSL	130 J	350	130 J	400 J	220 J	76 J	ND
Fluoranthene	2.20E+07 (n)	ND	ND	ND	980 J	630 J	ND	ND
Pyrene	1.70E+07	ND	ND	ND	1700 J	1200 J	ND	ND
Bis(2-ethylhexyl)phthalate	1.20E+05	ND	ND	ND	ND	ND	78 J	ND
Benzo(a)pyrene	2.10E+02	ND	ND	ND	420 J	ND	ND	ND
Indeno(1,2,3-cd)pyrene	2.10E+04	ND	ND	ND	400 J	480 J	ND	ND
Benzo(g,h,I)perylene	No RSL	73 J	51 J	68 J	800 J	960 J	66 J	ND
Inorganics (mg/kg)								
Aluminum	9.90E+08 (n)	7360	13700	13400	11600	10200	6390	8300
Arsenic	1.60E+03	8.2	6.3	4.9	5.3	6	4.3	8.9
Barium	1.90E+08 (n)	53.2 J	646 J	199 J	563 J	495 J	63.5 J	903 J
Beryllium	6.90E+06	0.38 J	0.43 J	0.25 J	0.73	1.2	0.24 J	0.56 J
Cadmium	9.30E+03	1.4	0.45 J	0.82	0.46 J	0.49	0.37 J	0.83
Calcium	No RSL	2040	3660	5290	13800	43500+	2420	22100
Chromium	No RSL	27.7	277	36.8	19.4	17.6	14.3	52.3
Cobalt	1.90E+06	5.2 J	3.9 J	6 J	5.3 J	3 J	2.5 J	5 J
Copper	4.10E+07 (n)	19.3	7.5	22.1	12.1	10.3	10.5	29.9
Iron	7.20E+08 (n)	19900	16000	22700	16300	12800	10700	15100
*Lead	8.00E+05 (n)	27.7 J	13.4 J	13.5 J	25.2 J	18.7 J	71.3 J	79.2 J
Magnesium	No RSL	2530	2120	5530	3020	7700	1210	4090
Manganese	2.30E+07 (n)	94.9 J	106 J	185 J	378 J	436 J	103 J	236 J
Nickel	No RSL	13.9	30.1	22.2	8.6	7.3	5.8	11.7

Table 2
Subsurface Soil Sampling Analytical Results for Detected Organic Compounds

	Sample ID →	SB-02-009	SB-02-008	SB-02-018	SB-03-028	SB-03-128	SB-24-041	SB-03-054
	Sample Date →	10/20/2010	10/21/2010	10/21/2010	10/25/2010	10/25/2010	10/25/2010	10/27/2010
	Media →	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil
	Process Area →	LimOH	Magnesium	Magnesium	SACI	SACI	SACI	SACI
	Sample Depth →	6"-24"	30"-55"	3"-35"	6"-30"	6"-30"	48"-60"	30"-50"
	FID →	1,900	2.40%	2.40%	3.00%	3.00%	1,250	NS
	ORNL Industrial Soil RSL* (µg/kg) 1E-06 Cancer Risk							
Potassium	No RSL	1040	3230	3270	813	1220	1710	853
Selenium	5.10E+06 (n)	4.2	2.1 J	3.6 J	3 J	1.9 J	ND	4.4
Silver	No RSL	0.49 J	ND	ND	ND	ND	ND	ND
Sodium	No RSL	ND	136 J	51.3 J	205 J	526	ND	2030
Vanadium	4.10E+06 (n)	28.8	144	36.1	23.7	21.7	18.7	24.7
Zinc	3.10E+08 (n)	39.2	36.8	56	43	31.3	48.4	90.8

Notes:

ORNLs based on cancer risk of 1E-06 and HQ of 1.0

ND = Non-Detect

J = Analyte present, reported value may not be accurate or precise
B = Not detected substantially above the blanks

L = Analyte present. Reported value may be biased low.

Acutal value is expected to be higher.

K = Off-scale low. Actual value is known to be less than the value given.

SB-03-128 is an MS/MSD corresponding with SB-03-028.

*Regional Screening Levels have been converted from mg/kg to µg/Kg.

(n) = non-cancer risk factor

Table 3
Subsurface Soil Sampling Analytical Results for Methanol and TPH DRO/GRO

Sample ID →	SB-01-002	SB-02-010	SB-02-007	SB-02-008	SB-02-012	SB-02-015	SB-02-016	SB-02-017A	SB-02-017B	SB-02-020	SB-02-024	SB-02-021
Sample Date →	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/19/2010	10/21/2010	10/22/2010	10/21/2010
Media →	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil
Process Area →	LimOH	LimOH	Magnesium	Magnesium	Magnesium	Magnesium	Magnesium	Magnesium	Magnesium	Magnesium	Magnesium	SACI
Sample Depth →	16"-30"	4"-30"	3"-14"	30"-55"	4"-12"	74"-80"	3"-63"	12"-28"	78"-108"	18"-36"	6"-32"	12"-36"
FID →	1,094	500	144	2.4%	6,200	6,000	3,800	1.44%	3.4%	6,100	3,350	3,100
↓ Analytes ↓	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
Methanol	810	ND	ND	1,200	1,500	1,100	3,000	1,100	1,100	1,700 B	1,100 B	1,700 B
TPH Compounds (ug/kg)												
Gasoline Range Organics	13,000 L	530 L	1,600 L	220,000 J	52,000 J	33,000 J	1,900 L	3,600 L	3,600 L	1,400,000 J	53,000 J	48,000 J
Diesel Range Organics	4,100,000	790,000	770,000	6,000,000	4,000,000	460,000	6,500,000	2,900,000	2,900,000	6,500,000	1,100,000	3,000,000

Table 3
Subsurface Soil Sampling Analytical Results for Methanol and TPH DRO/GRO

Sample ID →	SB-03-022	SB-03-027	SB-03-029A	SB-03-029B	SB-03-031	SB-06-038	SB-06-043	SB-03-045	SB-07-052
Sample Date →	10/22/2010	10/22/2010	10/25/2010	10/25/2010	10/25/2010	10/26/2010	10/26/2010	10/26/2010	10/26/2010
Media →	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil	Subsurface Soil
Process Area →	SACI	SACI	SACI	SACI	SACI	SACI	SACI	SACI	SACI
Sample Depth →	14"-36"	3"-17"	6"-24"	114"-132"	1"-16"	20"-36"	30"-40"	4"-20"	4"-64"
FID →	3,500	1,050	6,050	14	3,400	3,900	2,800	Rain	Rain
↓ Analytes ↓	Results	Results	Results	Results	Results	Results	Results	Results	Results
Methanol	1,300 B	2,200 B	1,900	840	1,000 B	1,400	2,600	1,100	1,600
TPH Compounds (ug/kg)									
Gasoline Range Organics	300,000 J	170,000 J	1,400 L	NS	730,000 J	350,000 J	2,100 L	1,500,000 J	960 L
Diesel Range Organics	7,700,000	110,000	4,800 J	NS	6,000,000	460,000	2,400,000	2,000,000	3,800,000

units are in ug/kg

UL = Non-Detect, Quantitation limit is probably higher.

ND = Non-Detect

J = Analyte present, reported value may not be accurate or precise

B = Not detected substantially above the level reported in the laboratory field blanks

L = Analyte present. Reported value may be biased low. Acutal value is expected to be higher.

NS = No Sample Collected

[redacted]

-

3.2 SURFACE WATER SAMPLE COLLECTION

On 01 December 2010, WESTON collected surface water grab samples during a rain storm that produced over 1 inch of rain at the Site. Ten samples were collected throughout the site from the drainage trenches and the WWTP were analyzed for TPH-DRO/GRO, methanol, oil and grease, and chromium.

Sample locations represent the lowest common point for water flow within the trenches of the process area before flowing into a combined sewer, which feeds into the Site's WWTP.

A vault box located on the outside perimeter of the WWTP and a sump located adjacent south of the WWTP were also sampled. Both of these areas fill with seeping groundwater. Neither the vault box perimeter nor the sump directly receives storm water through drainage piping from the process areas of the plant. The following list summarizes the locations of the surface water samples (**Figure 4**):

- SCT-120110-WS-01-01: Drop box under roll off bin containing fly ash material.
- SCT-120110-WS-01-02: Drop box adjacent to T-104.
- SCT-120110-WS-01-03: Trench drain in the vicinity T-495.
- SCT-120110-WS-01-04: Trench drain between T-134 and Main Stack.
- SCT-120110-WS-01-05: Intersection of trenches bordering outer fence by rail yard.
- SCT-120110-WS-01-06: Under manhole cover in middle of road in SACI area.
- SCT-120110-WS-01-07: Pooled water in containment area adjacent to closed off drain.
- SCT-120110-WS-01-08: Sump at WWTP.
- SCT-120110-WS-01-09: 10 feet x 10 feet catch box at WWTP.
- SCT-120110-WS-01-10: Water surrounding vault box at WWTP.

3.3 SAMPLE NOMENCLATURE

WESTON assigned each sample a unique number. The project samples were identified using the following format:

SCT-[Date]-[Sample Type]-[Station ID]-[Sample Number]

SCT – Abbreviation of Stoney Creek Technologies site.
Date – The date the sample was collected indicated as MMDDYY.
Sample Type – Specialized abbreviation that tells what kind of sample was collected:

- "SB" – Soil Boring – Subsurface Soil Sample
- "WS" – Water Sample – Site Drainage Sample
- "EB" – Equipment Blank (quality control [QC] sample)
- "FB" – Field Blank (QC sample)
- "SS" – Surface Soil Samples

Station ID – Unique four digit identifier used to identify an AOC.
Sample Number – Unique three digit identifier used to identify the specific sample.
Examples of the sample identifications for the site are as follows:

- SCT-100410-SB-01-001: Subsurface soil sample #1- collected on October 04, 2010 from AOC 0001 at the Stoney Creek Technologies Site.

- SCT-100410-WS-04-001: Water sample #1 collected on October 04, 2010 from AOC 04 at the Stoney Creek Technologies Site.

3.4 SAMPLE HANDLING PROCEDURES

Samples were handled and packaged in accordance with the START-4 *Program-Wide Uniform Federal Policy Act Quality Assurance Project Plan (QAPP)* (WESTON, 2010). A photographic documentation log is included in **Appendix A**. Shipping coolers were properly labeled with chain-of-custody seals and shipped via FedEx® to the EPA Region 3 Laboratory located at Fort Meade, Maryland. Coolers were shipped with signed chain-of-custody forms (**Appendix B**). WESTON personnel conducted photographic and written documentation of sampling activities. Field logbook documentation was conducted in accordance with WESTON's QAPP for START (WESTON, 2010).

[redacted]

4. ANALYTICAL RESULTS

This section discusses the analytical results of the sub subsurface soil and surface water sampling collected at the Site in October 2010 and December 2010, respectively. Samples were analyzed in accordance with the following method:

Summary of Subsurface Soil Analytical Parameters:

Parameters	Number of Samples	Method
Methanol	20	8260B
TPH-DRO/GRO	20	SW8015B
VOCs	7	SOM01.2
SVOCs	7	SOM01.2
PEST/PCBs	7	SOM1.2
Metals	7	ILM05.4

Summary of Surface Water Analytical Parameters:

Parameters	Number of Samples	Method
Methanol	10	SW8260
TPH-DRO/GRO	10	SW8015B
Oil and Grease	10	EPA1664A
Chromium	10	ILM05.4

Analytical results were validated by the EPA Region 3 Environmental Services Assistance Team (ESAT) contractor. A copy of the laboratory analytical data packages from EPA Region 3 Laboratory and the ESAT-validated report are included in **Appendix B** of this report.

[redacted]

4.1 SUBSURFACE SOIL SAMPLING RESULTS SUMMARY

The analytical results for subsurface soils sampling are summarized in micrograms per kilogram (µg/Kg). **Table 2** contains the analytical results for all detected compounds collected for full suite TCL/TAL analysis. **Table 3** contains the analytical results for all methanol and TPH-DRO/GRO analysis.

Fifty-six direct push Geoprobe borings were collected throughout the Site to visually observe and record vapor reading and collect samples at multiple depths below ground surface. In addition to a visual screening, borings were analyzed every 6 inches with an FID for vapor readings and recorded for each soil boring. At the discretion of the OSC, grab samples were collected directly at the selected interval where staining and/or vapor reading were observed. Twenty samples were collected for TPH-DRO/GRO and methanol. Seven samples, including a duplicate sample, were also analyzed for a full suite TCL/TALs: VOCs, SVOCs, PEST, PCBs, and total metals.

In the LimOH area, a total of seven soil borings were collected for visual observation. Of the seven, two samples (SB-002 and SB-010) were collected for methanol and TPH-DRO/GRO and one sample (SB-009) was collected for full suite TCL/TAL analysis. The results are shown in **Table 2** and **Table 3**, respectively. Seven organic compounds were detected including acetone, methylcyclohexane, 2-methylnaphthalene, fluorine, n-nitrosodiphenylamine, phenanthrene, and benzo(g,h,I)perylene. All of the organic compounds were detected below their respective Industrial Soil Regional Screening Levels (RSLs) for non-cancer risk, and the respective Industrial Soil RSLs for cancer risk of 1E-06. Nineteen metals were also detected in the LimOH area. All metals were detected below their respective Industrial Soil RSL for non-cancer and cancer risk of 1E-06.

In the Magnesium area (Mag), a total of 16 soil borings were collected for visual observation. Of the 16 samples, nine were collected from eight locations for methanol, and TPH-DRO/GRO and two samples were collected for full suite TCL/TAL analysis. The results are shown in **Table 2** and **Table 3**, respectively. Eleven organic compounds were detected including acetone, carbon disulfide, benzene, methylcyclohexane, toluene, o-xylene, 2-methylnaphthalene, dimethylphthalate, fluorine, phenanthrene, and benzo(g,h,i)perylene. All of the organic compounds were detected below their respective Industrial Soil RSLs for non-cancer risk, and the respective Industrial Soil RSLs for cancer risk of 1E-06. Nineteen metals were also detected in the LimOH area. All metals were detected below their respective Industrial Soil RSL for non-cancer and cancer risk of 1E-06.

In the SACI area, a total of thirty two soil borings were collected for visual observation. Of the thirty two soil borings samples collected for visual observation, ten were collected from nine locations for methanol, and TPH-DRO/GRO and four samples, including a duplicate, were collected for full suite TCL/TAL analysis. The results are shown in **Table 2** and **Table 3**. Twenty-three organic compounds were detected including acetone, carbon disulfide, methylene chloride, cis-1,2-dichloroethene, cyclohexane, benzene, trichloroethene, methylcyclohexane, toluene, tetrachloroethene, ethylbenzene, o-xylene, m,p-xylene, isopropylbenzene, naphthalene, 2-methylnaphthalene, fluorine, phenanthrene, fluoranthene, pyrene, bis(2-ethylhexyl)pyrene, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene. All of the organic compounds were detected below their respective Industrial Soil RSLs for non-cancer risk, and the respective Industrial Soil RSLs for cancer risk of 1E-06. The 19 metals detected in the SACI area were detected below their respective Industrial Soil RSL for non-cancer and cancer risk of 1E-06.

Generally, compounds were reported at the highest concentrations in the SACI area and the lowest concentrations in the LimOH area.

[redacted]

4.2 SURFACEWATER SAMPLING RESULTS SUMMARY

The analytical results for the surface water sampling are summarized in micrograms per liter (µg/L). **Table 4** contains the analytical results for all detected compounds collected for chromium, oil and grease, and TPH-DRO/GRO analysis.

Ten samples were collected throughout the site during a rain event which produced over 1 inch of rain to the Site (**Figure 4**). Seven samples were collected from the drainage trenches within the three process areas (LimOH, Mag, and SACI). Sample locations represent the lowest common point for water flow within the trenches of the process area before flowing into a combined sewer, which feeds into the Site's WWTP. Two samples collected from the WWTP and one sample was collected from a sump located adjacent to the WWTP.

Within the Site's drainage sampling locations, the highest level of DRO was found at sample location WS-05, which is located in the Mag area at the intersection of trenches by the north fence adjacent to the railroad. This area has observed oily material seeping out of the rail bed ballast under the fence and into the drainage system. Elevated levels of DRO were also reported in the drain between tank 134 and the main stack (WS-04). Storm water flows from WS-05 down gradient through WS-04, which is the final outfall before flowing into the main sewer. The highest levels of DRO were reported in the sump at the WWTP (WS-08), in the WWTP oil/water separator vault box (WS-10), and in the WWTP 10X10 tank (WS-09). These locations also contained the only detected results of GRO. Similarly, elevated levels of chromium were also detected in these three sample locations. The highest detected concentration of chromium (39.9 µg/L) was reported from the drainage trench by tank 495 (WS-03).

Oil and grease was detected at low levels in sample locations WS-01 through WS-04, WS-08, and WS-10. The highest concentrations were detected in the sump (SW 8) at 297 mg/L and the WWTP oil/water separator vault box (SW 10) at 64.7 mg/L.

Methanol was not detected in any surface water samples.

Table 4
Surface Water Analytical Results

Sample ID →	WS-01-01	WS-01-02	WS-01-03	WS-01-04	WS-01-05	WS-01-06	WS-01-07	WS-01-08	WS-01-09	WS-01-10
Sample Date →	12/1/2010	12/1/2010	12/1/2010	12/1/2010	12/1/2010	12/1/2010	12/1/2010	12/1/2010	12/1/2010	12/1/2010
Sample Type →	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Process Area →	LimOH	LimOH	Magnesium	Magnesium	Magnesium	SACI	SACI	SUMP	WWTP	WWTP
↓ Analytes ↓	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Chromium (ug/L)	2.9 J	1.8 J	39.9	1.5 J	ND	1.2 J	0.66 J	14.1	8.2 J	9.2 J
Oil and Grease (mg/L)	5.6	6.4	6.3	6.0	ND	ND	ND	297	18.8	64.7
Methanol (ug/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TPH Compounds (ug/L)										
Gasoline Range Organics	ND	ND	ND	ND	ND	ND	ND	1,700	580	1,700
Diesel Range Organics	600 B	610 B	520 B	1,200	2,700	450 B	290 B	3,500	3,800	5,800

ND = Non-Detect
J = Analyte present, reported value may
B = Not detected substantially above the
the level reported in the laboratory field
blanks.
L = Analyte present. Value biased low.
NS = No Sample Collected

[redacted]

REFERENCES

WESTON (Weston Solutions, Inc.). 2010. START-4 *Program-Wide Uniform Federal Policy Act Quality Assurance Project Plan (QAPP).* October 2010.

WESTON (Weston Solutions, Inc.). 2010. *Field Sampling Plan for Stoney Creek Technologies.* September 2010.

FIGURES

File: \\fsfed01\tig\EPA_Region_II\StoneyCreekTech\mxd\USGS.mxd, 24-Sep-10 12:19, ricksc

Legend

Site Boundary

N
W E
S

0 1,500
Feet

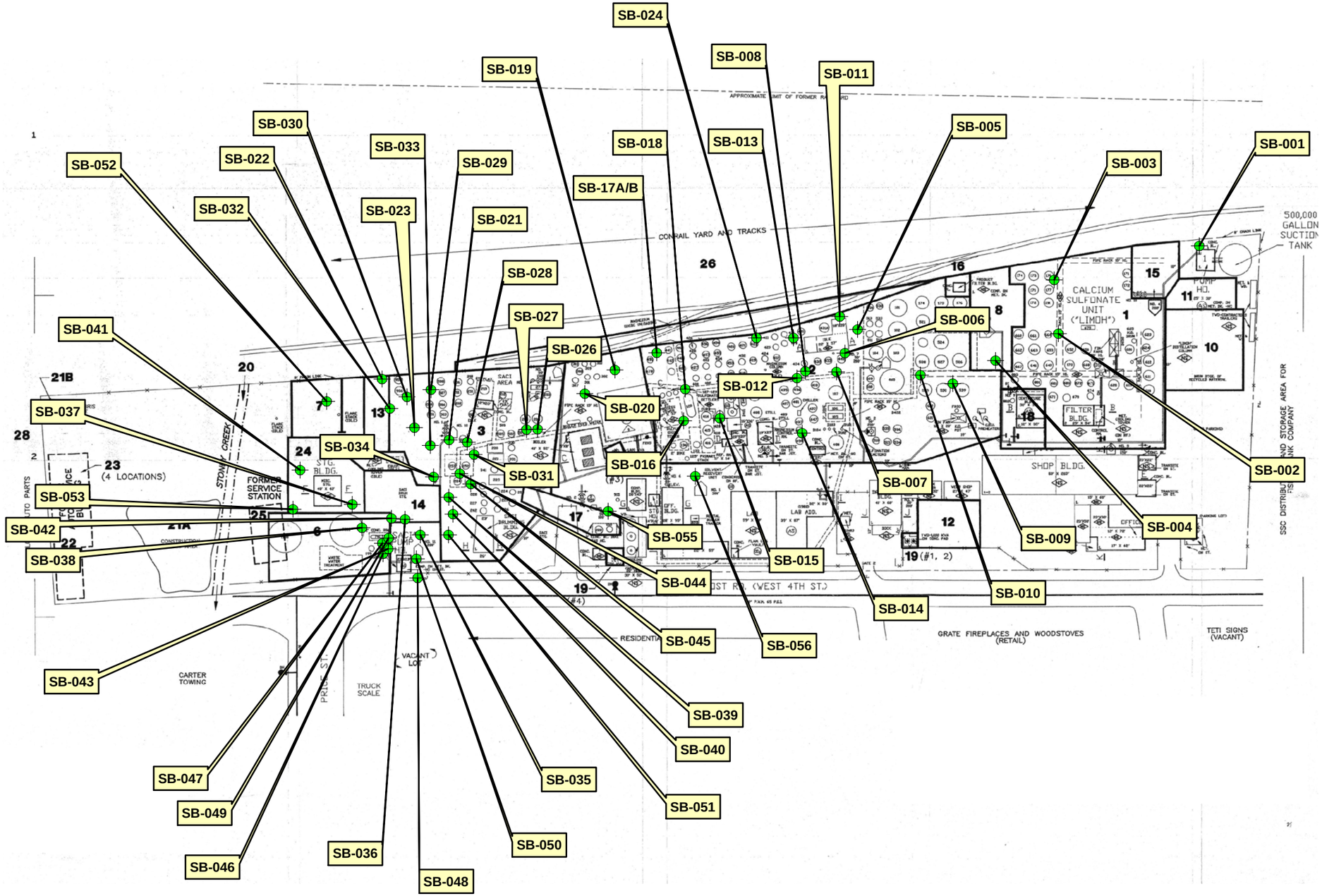
PA State Plane, NAD83, feet

Source: ESRI, USGS Quads
Marcus Hook, PA, NJ, Del 1989
Photorevised 1993

Figure 1
Site Location Map

Stoney Creek Technologies
Trainer, Delaware County, PA

WESTON SOLUTIONS



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Soil Boring Locaiton

Stoney Creek Technologies
Trainer, Delaware County, PA

Figure 2
Geoprobe Locations

WESTON SOLUTIONS

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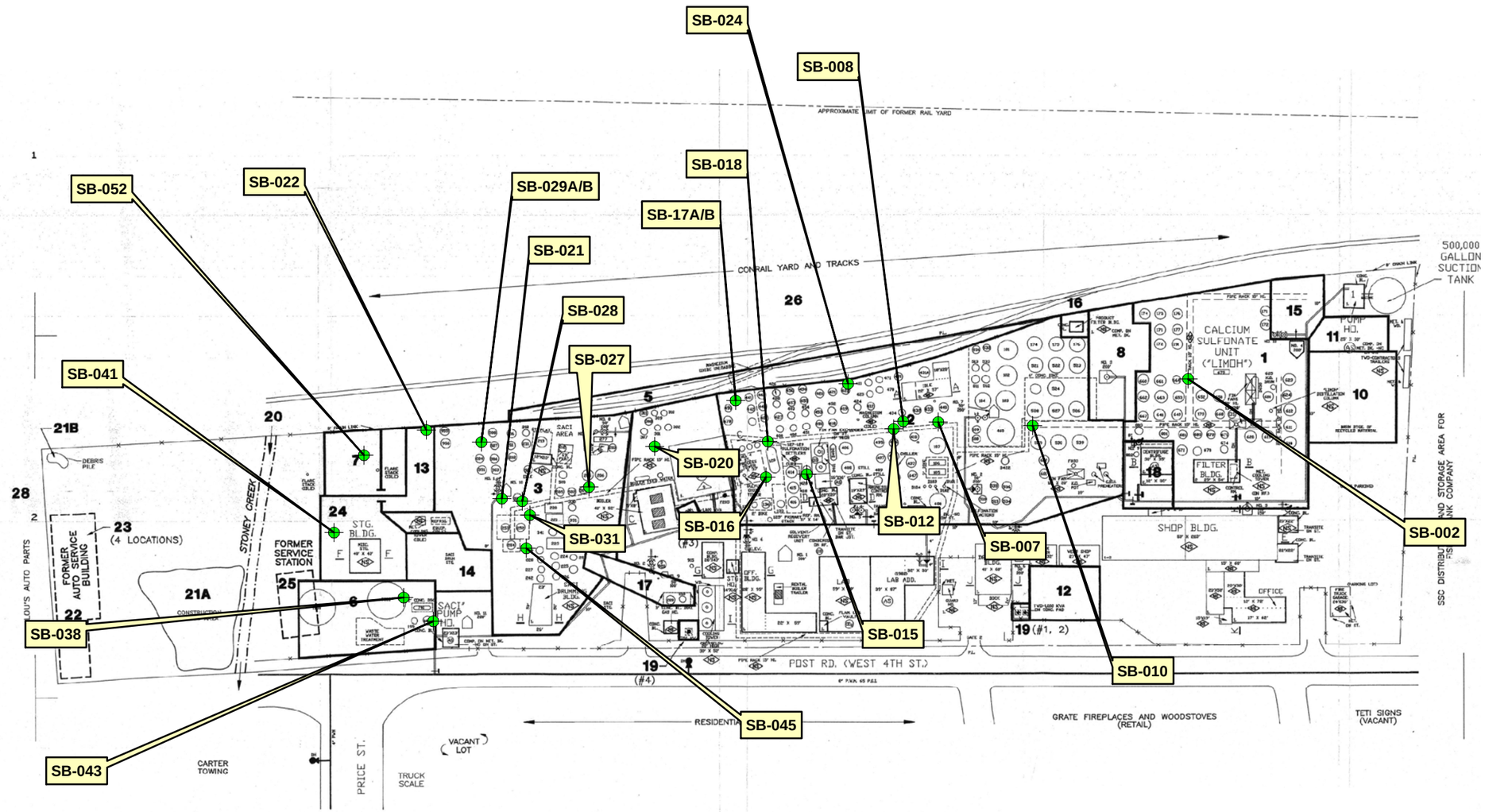

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Soil Boring Locaiton

N

W E

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Stoney Creek Technologies
Trainer, Delaware County, PA

Figure 3
Sampled Geoprobe Locations

WESTON SOLUTIONS

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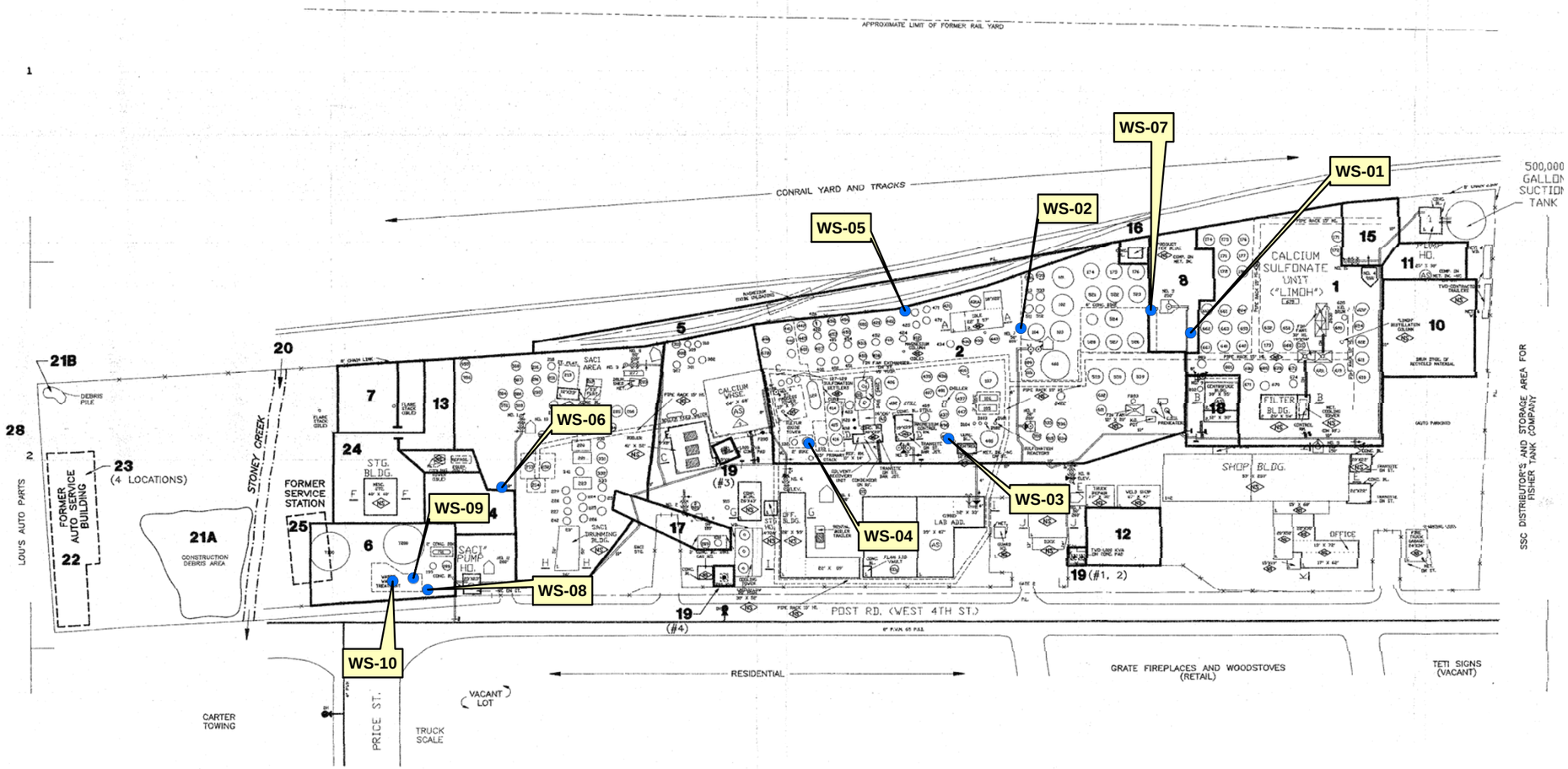

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- Sufrace Water Sample Location

N
W E
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Stoney Creek Technologies
Trainer, Delaware County, PA

Figure 4
Surface Water
Sample Locations

WESTON SOLUTIONS

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