REMEDIAL ACTION IMPLEMENTATION REPORT

MARTINO'S MASTER CLEANERS
7513 41st AVENUE
KENOSHA, WISCONSIN 53142
WDNR BRRTS# 02-30-552188

June 11, 2018

Prepared For:

Martino's Master Dry Cleaners
7513 41st Avenue
Kenosha, Wisconsin 53142

Prepared By:

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Senior Engineer

Brian Kappen, PG
Project Manager

Document: 6165-1764

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CERTIFICATIONS

I, Andrew Horwath, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Senior Engineer, P.E. License No. E-43831-6

Signature, title and P.E. number

WISCONSIN
ANDREW D HORWATH
E-43831-6
NOBLESVILLE IN
PROFESSIONAL ENGINEER

Andrew D. Horwath
2018.06.11 15:05:24 -04'00'

P.E. stamp

I, Brian Kappen, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Project Manager

Signature and title

6/11/2018

Date

1.0 INTRODUCTION

EnviroForensics LLC (EnviroForensics) has prepared this Remedial Action Implementation Report on behalf of Martino's Master Dry Cleaners (Martino's) for the facility located at 7513 41st Avenue in Kenosha, Wisconsin (Site). This report has been prepared in accordance with Wisconsin Administrative Code (WAC) Chapter NR 724 and other associated State of Wisconsin Chapter NR 700 series rules.

The general layout of the Site, including Site features, and the surrounding area, is depicted on **Figure 1**. The Site encompasses approximately 0.36 acres and contains a single slab-on-grade building which occupies 5,154 square feet. The Site building is situated at the south end of a "strip mall" and adjoins the building to the north. The Site is currently the main dry cleaning plant for Martino's.

Remedial actions were implemented to address subsurface contamination resulting from release of tetrachloroethene (PCE). The remedy selected for the Site was soil vapor extraction (SVE). The primary objective of SVE is to remove contaminant mass from unsaturated soil. SVE may provide the additional benefit of vapor intrusion mitigation at the Site building during operation.

2.0 SOIL VAPOR EXTRACTION REMEDIATION SYSTEM

2.1 Pilot Study

EnviroForensics initially conducted an SVE pilot study to evaluate the efficacy of SVE as a remedial measure at the Site. The study utilized one (1) SVE well and eleven vapor monitoring points (including seven (7) existing water table monitoring wells). Approximately 24 hours of continuous testing was performed during March 22-23, 2016. During the study, volumetric airflow rates, applied vacuums, subsurface vacuums, and influent air total volatile organic compound (VOC) concentrations were monitored at fixed intervals. Effluent air samples were also collected into laboratory-supplied canisters and submitted to a laboratory for VOC analysis.

Subsurface vacuum measurements during testing indicated a source removal radius of influence (ROI) of 17 feet and a vapor capture ROI of 32 feet. The total mass of volatile organic compounds (VOCs) removed during the pilot study was estimated at 0.038 pounds. Coupling effluent vapor concentrations with the effluent flow rates during the study indicated a potential mass removal rate of approximately 20 pounds per extraction well per year during full-scale operation.

The pilot study results indicated that SVE is a viable remedial alternative for unsaturated soil at the Site. The pilot study procedures, analysis, and results are detailed in the *Soil Vapor Extraction Pilot Study Report* dated November 2, 2016.

2.2 Design

The full-scale SVE system design was derived from the pilot study data. A vacuum pump capable of inducing a flow rate of 315 actual cubic feet per minute (acfm) was specified. The design called for two (2) extraction wells, including the well installed for the pilot study, connected to a single conveyance line. Above ground and subsurface polyvinyl chloride (PVC) conveyance piping was specified to connect the extraction wells to a vacuum pump and associated equipment and controls housed in a skid-mounted container on the east side of the building. The system was constructed and installed with no deviations from the original design.

2.3 System Construction

The SVE system was constructed in three general phases between November 2016 and January 2018:

- Extraction well installation;
- Wellhead and conveyance piping installation; and
- Mechanical system construction and connection.

2.3.1 Extraction Well and Monitoring Point Installation

Extraction well SVE-1 was installed in March of 2016 prior to the pilot study. SVE-1 was constructed of 4-inch diameter, Schedule 40 PVC, with a 0.020-inch slotted Vee-Wire® screen from 4 to 9 feet below ground surface (bgs). A filter pack consisting of coarse sand was installed from 4 to 9 feet bgs. Hydrated bentonite chips were installed from 3 to 4 feet bgs, and 2 feet of bentonite-cement grout was installed above the bentonite chips. The original 12-inch diameter steel vault was replaced in May 2017 with a 24-inch square vault set in concrete. The larger vault was installed to permit access to a valve at the wellhead.

Extraction well SVE-2 was installed by hand auger inside the building near the former dry cleaning machine location. Well material was 4-inch diameter, Schedule 40 PVC, with a 0.020-inch slotted Vee-Wire® screen placed from 4 to 9 feet bgs. A filter pack consisting of coarse sand was installed from 4 to 9 feet bgs. Hydrated bentonite chips were installed from 3 to 4 feet bgs, and 3 feet of bentonite-cement grout was installed above the bentonite chips. SVE-2 was completed by extending the riser pipe through floor and patching the floor with new concrete around the pipe. Extraction well construction diagrams are shown on **Figures 2 and 3**.

Two (2) double-nested vacuum monitoring points (MP-1s/d and MP-2s/d) were also installed for the pilot study. The points were installed using hollow-stem auger drilling methods in 10-inch diameter boreholes. The monitoring points were constructed with 1-inch diameter, Schedule 40 PVC, 0.010-inch slotted well screens, and coarse sand filter pack. The screen for each shallow point (MP-1s and MP-2s) was installed at 3 to 6 feet bgs. The screen for each deep point (MP-1d and MP-2d) was installed at 7 to 10 feet bgs. Filter pack sand was installed spanning each screened interval. Hydrated bentonite chips were installed from 6-7 feet bgs to separate the two (2) screened intervals. Hydrated bentonite chips were also installed above the upper screen from 2 to 3 feet bgs, followed by bentonite-cement grout from 1-2 feet bgs. The vacuum monitoring points were finished at grade with a flush-mounted steel vault set within a concrete pad. A vacuum monitoring point construction diagram is provided on **Figure 4**.

2.3.2 Wellhead and Conveyance Piping Installation

Conveyance piping was installed to connect the extraction wells to the vacuum pump. The installation work was completed April 12-14, 2017. Both extraction wells are connected to a common conveyance line constructed of 4-inch diameter PVC pipe. The conveyance piping was installed above ground inside and outside the building, and in trenches along the south side of the building. The trenched portions are approximately 24 inches below grade. The trenches were backfilled with pea gravel followed by asphalt or decorative stone at the surface to match the surrounding material. The extraction well and conveyance piping layout is depicted on **Figure 5**. Photographs taken during installation are provided in **Appendix A**.

Wellheads were constructed with vacuum measurement ports and threaded caps to allow access to the screens. Ball valves were installed at the connection from the wells to the conveyance line so that each extraction well can be disconnected from service if needed. Diagrams of the wellhead configurations are depicted on **Figures 2 and 3**.

2.4 Mechanical System Components

EnviroForensics directed the installation of the mechanical system during May 2017. The mechanical system consists of the following components:

- Busch Mink MM 1502 claw vacuum pump with 20 horsepower (HP) motor
- Master Control Panel with Variable Frequency Drive (VFD) Controls
- 100 gallon air-water separator with probe level switches
- 1.5 HP transfer pump
- Secondary water storage drum with level sensor
- Inlet filter
- Dwyer air velocity transmitter

The components are contained in a skid-mounted steel enclosure measuring approximately 10 feet long by 6 feet wide. The vacuum pump exhaust stack extends out the side of the enclosure to a height of 8 feet above ground surface. Exhaust samples are collected from a port in the stack downstream from the vacuum pump. A system process and instrumentation diagram and legend are presented on **Figures 6 and 7**, respectively.

2.5 Operation and Maintenance

The SVE system is designed to operate continuously. Either extraction well can be disconnected from service by closing the ball valve installed at the wellhead. This design will allow the operators to target specific areas and/or depths as the remediation progresses to maximize efficiency. Operational changes are made as needed during the maintenance visits described below.

Operation and maintenance activities are conducted by EnviroForensics personnel to:

- Maximize system efficiency and contaminant mass removal rates;
- Maintain the mechanical equipment in good working order; and
- Collect data to track system performance and determine a timeframe for shutdown.

Routine maintenance activities performed monthly include the following:

- Service the vacuum pump as recommended by the manufacturer;
- Record operational parameters and vapor concentrations to evaluate efficiency:
    - Effluent VOC vapor concentration;
    - System runtime;
    - System vacuum;
    - Wellhead vacuums;
    - Vacuum at monitoring points;
    - Flow rate; and
    - Exhaust temperature.

Additional maintenance visits may be required to address system shutdowns or operational issues. EnviroForensics has prepared an Operation, Maintenance, and Monitoring Plan (OM&M Plan) that details the operation and maintenance procedures. The OM&M Plan is provided as **Appendix B**.

2.6 Performance Monitoring

Samples of the SVE system air emissions are collected from a port in the exhaust stack and analyzed for VOCs to track mass removal; and to determine operational changes to optimize

system performance. Performance monitoring is conducted in accordance with the following emissions testing schedule required under WAC Chapter 419.07:

- Once each day for the first three (3) days of system operation;
- Weekly for the next three (3) weeks; and
- Monthly thereafter.

A commissioning phase was completed to confirm that system emissions are below permitting thresholds and ambient air standards. The permitting thresholds that apply to SVE systems (WAC Chapters NR 406 and 407, respectively) are as follows:

- Total VOC limit of 5.7 pounds per hour (lb/hr).
- PCE limits of 9.11 lb/hr and 301 pounds per year (lb/yr).

The SVE system operated intermittently during the first three (3) days due to troubleshooting various components. Therefore, samples of the system emissions were collected during the first and third days of system operation (covering 15 hours of actual operation) to demonstrate compliance with the permitting requirements. The VOC emission rate at system startup was approximately 0.1 pounds per hour, which is well below the hourly emission limit. It is anticipated that the amount of PCE emitted will be well below the 301 lb/yr limit; however, the emission rate will be closely tracked to ensure compliance. The laboratory reports associated with system commissioning are included in **Appendix C**.

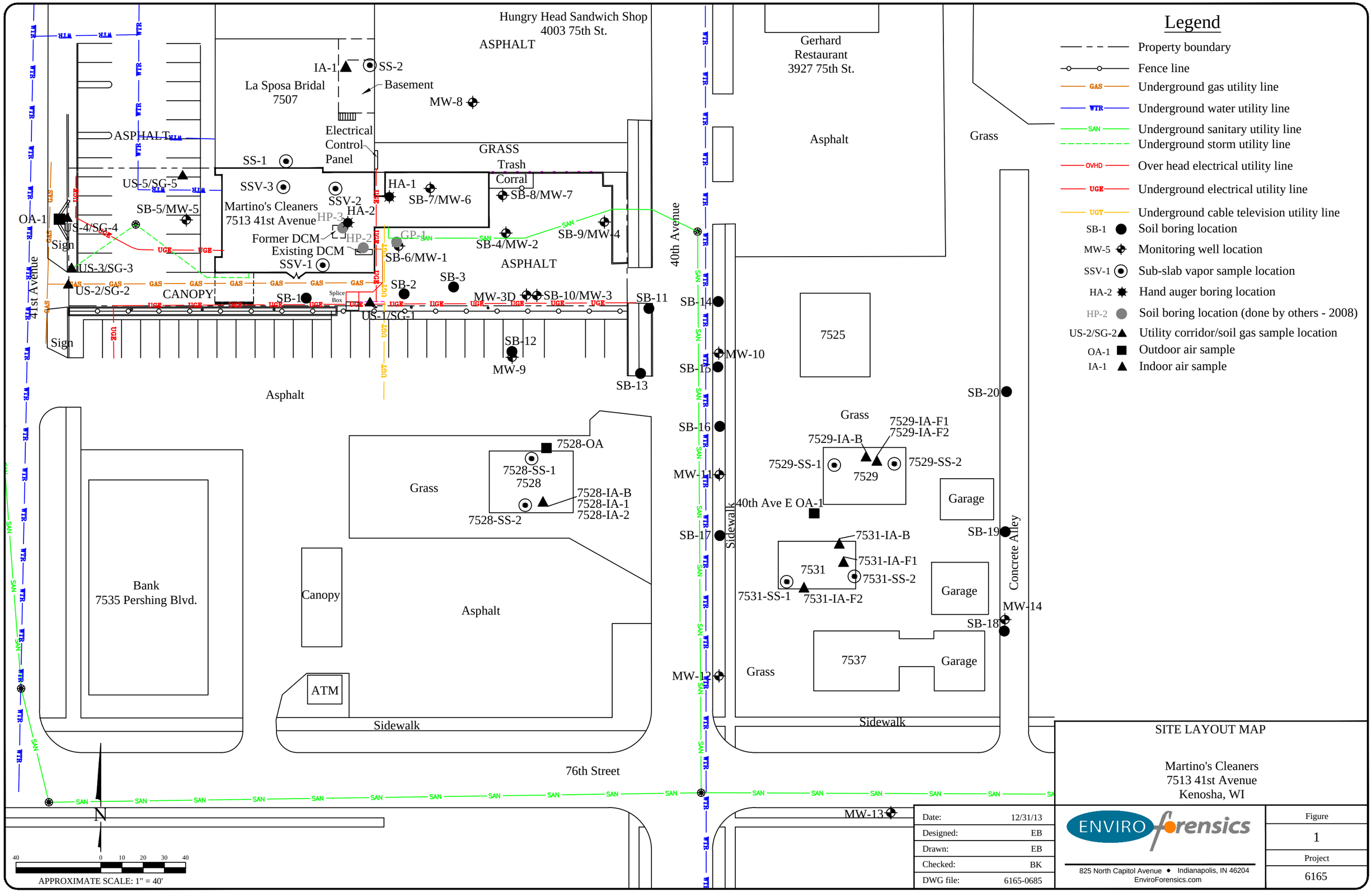
Outdoor air samples were also collected during system startup to confirm that emissions do not affect air quality at adjacent properties or to tenants of the on-Site buildings. The ambient air standards are established in WAC Chapter NR 445. The samples were collected at the property boundaries directly south and east of the SVE system location (i.e. toward the nearest residential properties). The air samples were collected in 6-liter vacuum canisters over a 24-hour period during the second day of system operation. The compounds of concern were not detected in the outdoor air samples. The laboratory report is included in **Appendix C**.

Remediation performance, including calculations of mass removal rates and cumulative mass removed, will be reported on Remediation Site Operation, Maintenance, Monitoring & Optimization Reports (Form 4400-194). The reports will be prepared and submitted to WDNR semi-annually as required.

3.0 SUMMARY

An SVE system was designed and installed to address VOC impacts in vadose zone soil. Mass removal via SVE is in progress, and the system will be adjusted and operated to maximize efficiency. In addition, the SVE system has interrupted vapor transport mechanisms and has likely improved mitigation of the vapor exposure pathway in the Site building. Remediation performance and progress will be monitored and reported to WDNR as required.

FIGURES



Legend

- Property boundary
- Fence line
- GAS — Underground gas utility line
- WTR — Underground water utility line
- SAN — Underground sanitary utility line
- Underground storm utility line
- OVHD — Over head electrical utility line
- UGE — Underground electrical utility line
- UGT — Underground cable television utility line
- SB-1 — Soil boring location
- MW-5 — Monitoring well location
- SSV-1 — Sub-slab vapor sample location
- HA-2 — Hand auger boring location
- HP-2 — Soil boring location (done by others - 2008)
- US-2/SG-2 — Utility corridor/soil gas sample location
- OA-1 — Outdoor air sample
- IA-1 — Indoor air sample

SITE LAYOUT MAP

Martino's Cleaners
7513 41st Avenue
Kenosha, WI

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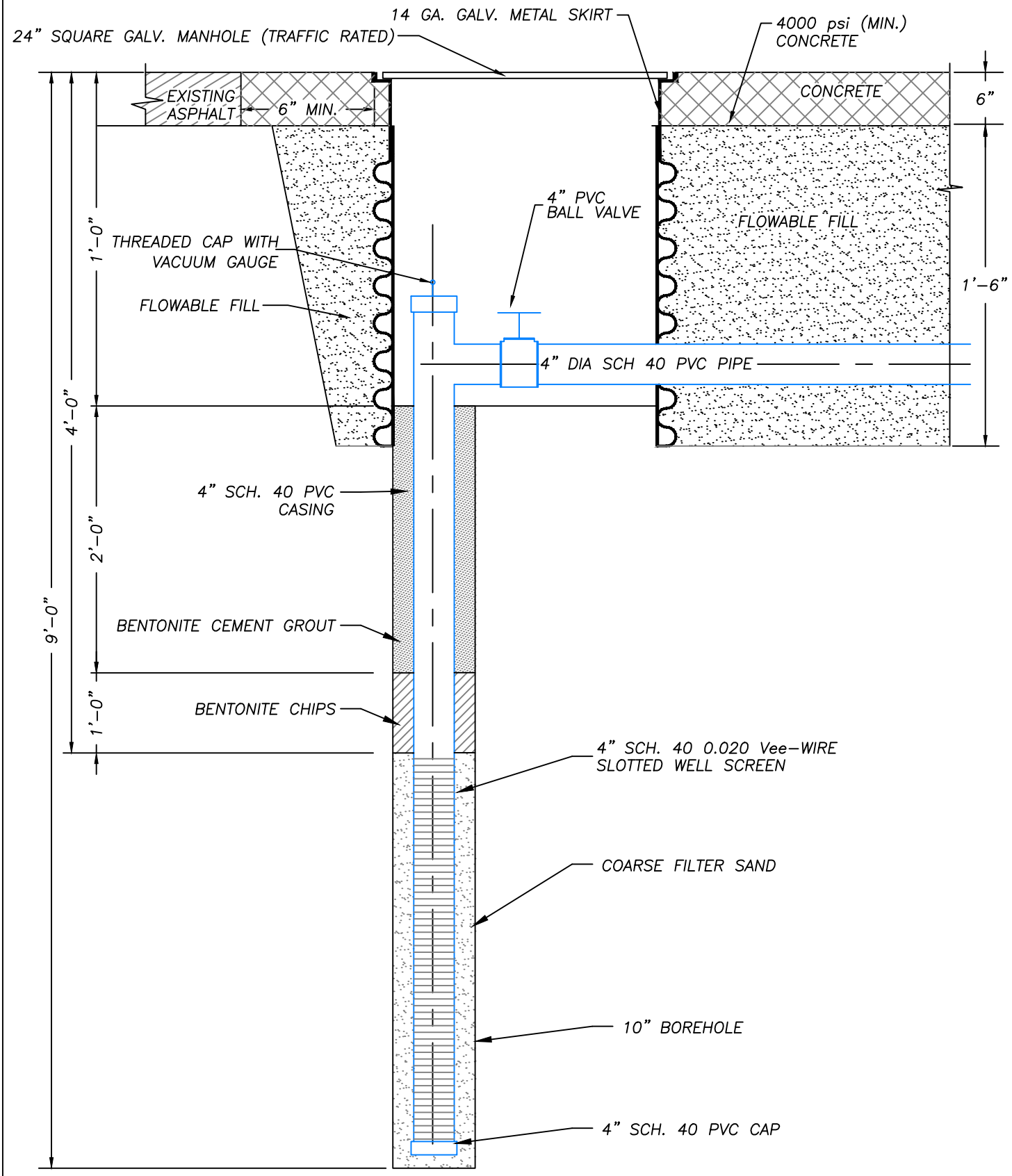
Figure 1

Project 6165



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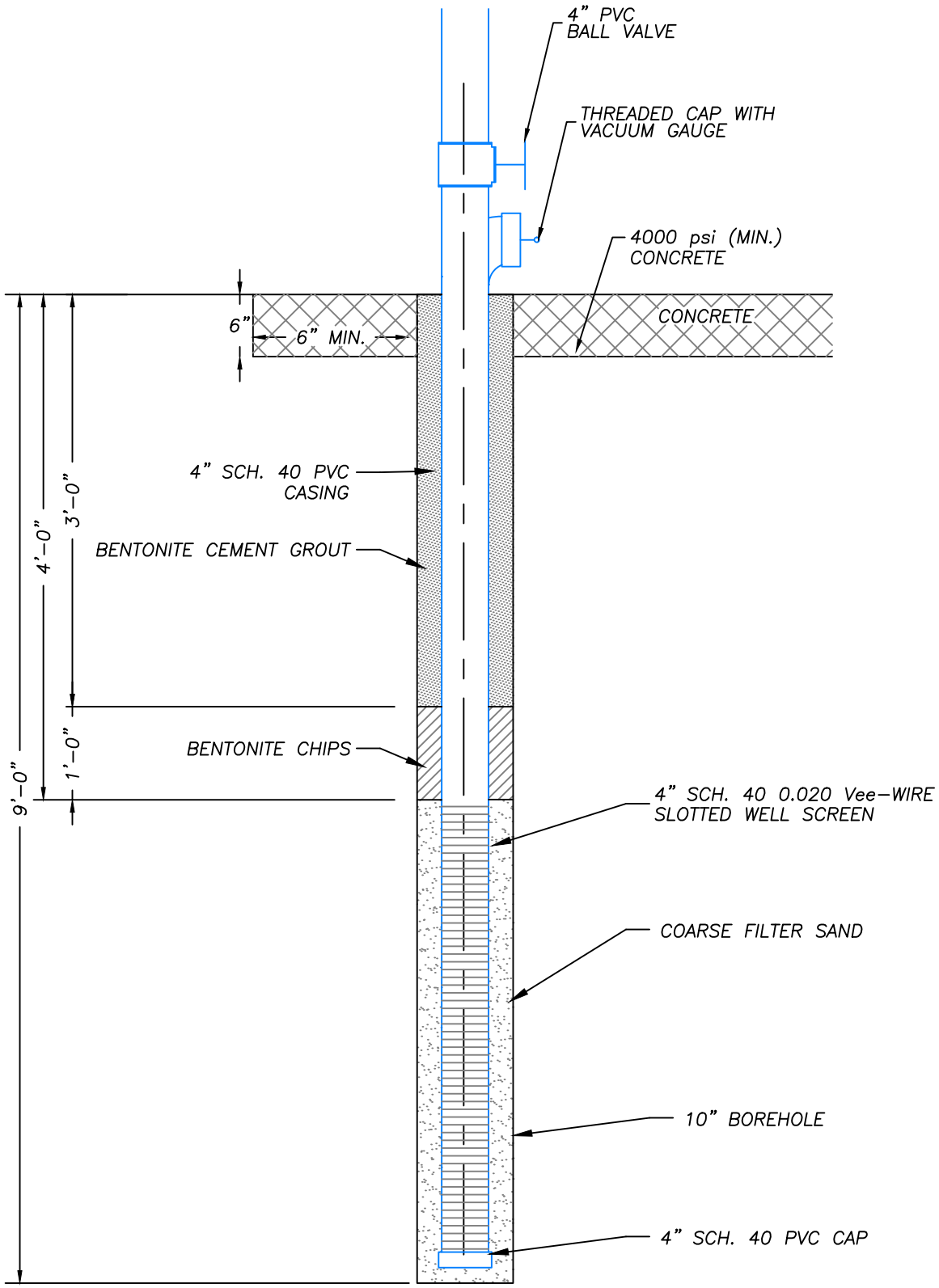
SVE EXTERIOR WELLHEAD CONNECTION DIAGRAM

Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure 2

Project 6165



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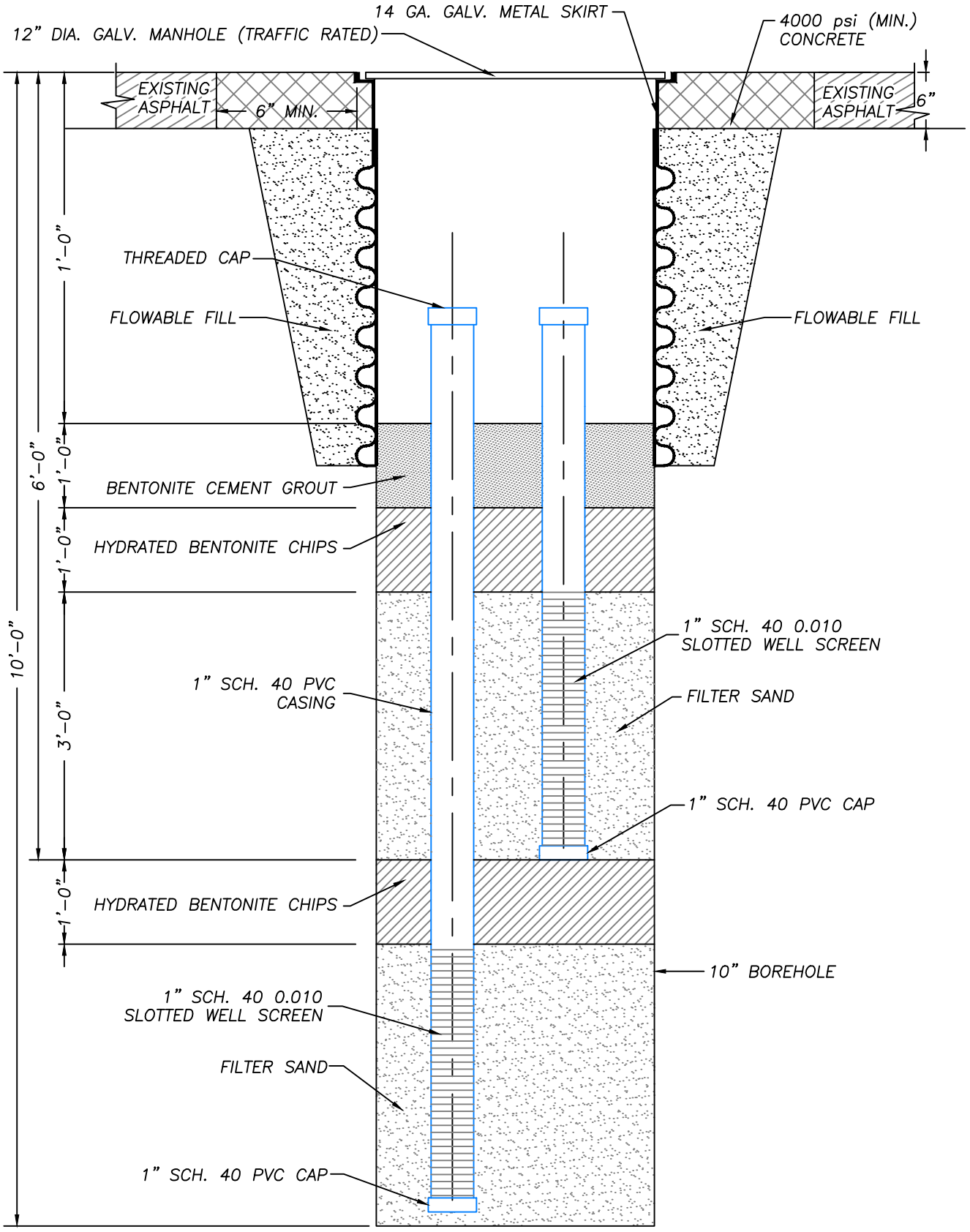
SVE INTERIOR WELLHEAD CONNECTION DIAGRAM

Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure 3

Project 6165



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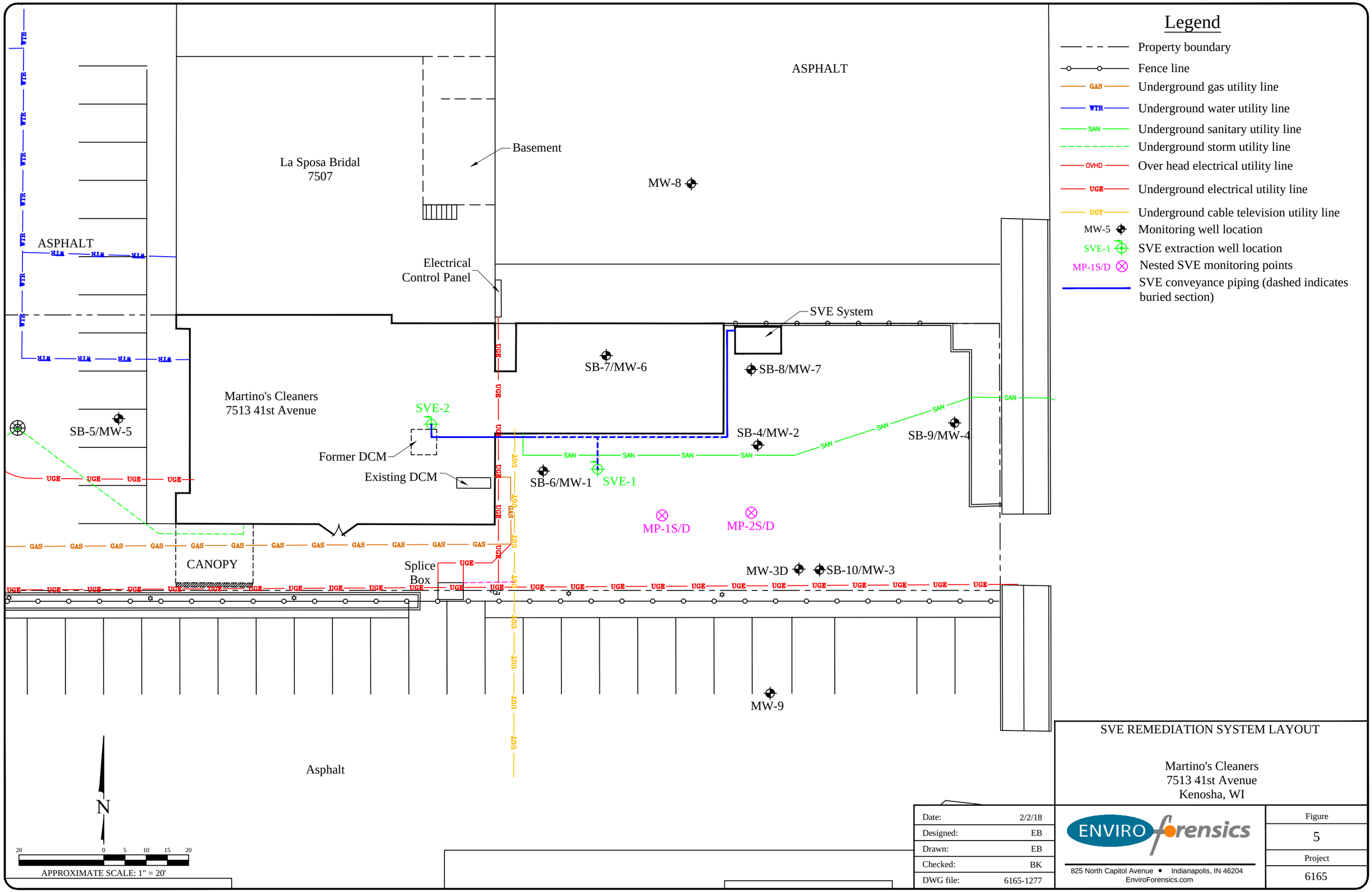
VACUUM MONITORING POINT CONSTRUCTION DIAGRAM

Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure 4

Project 6165



SVE REMEDIATION SYSTEM LAYOUT

Martino's Cleaners
7513 41st Avenue
Kenosha, WI

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Figure
5

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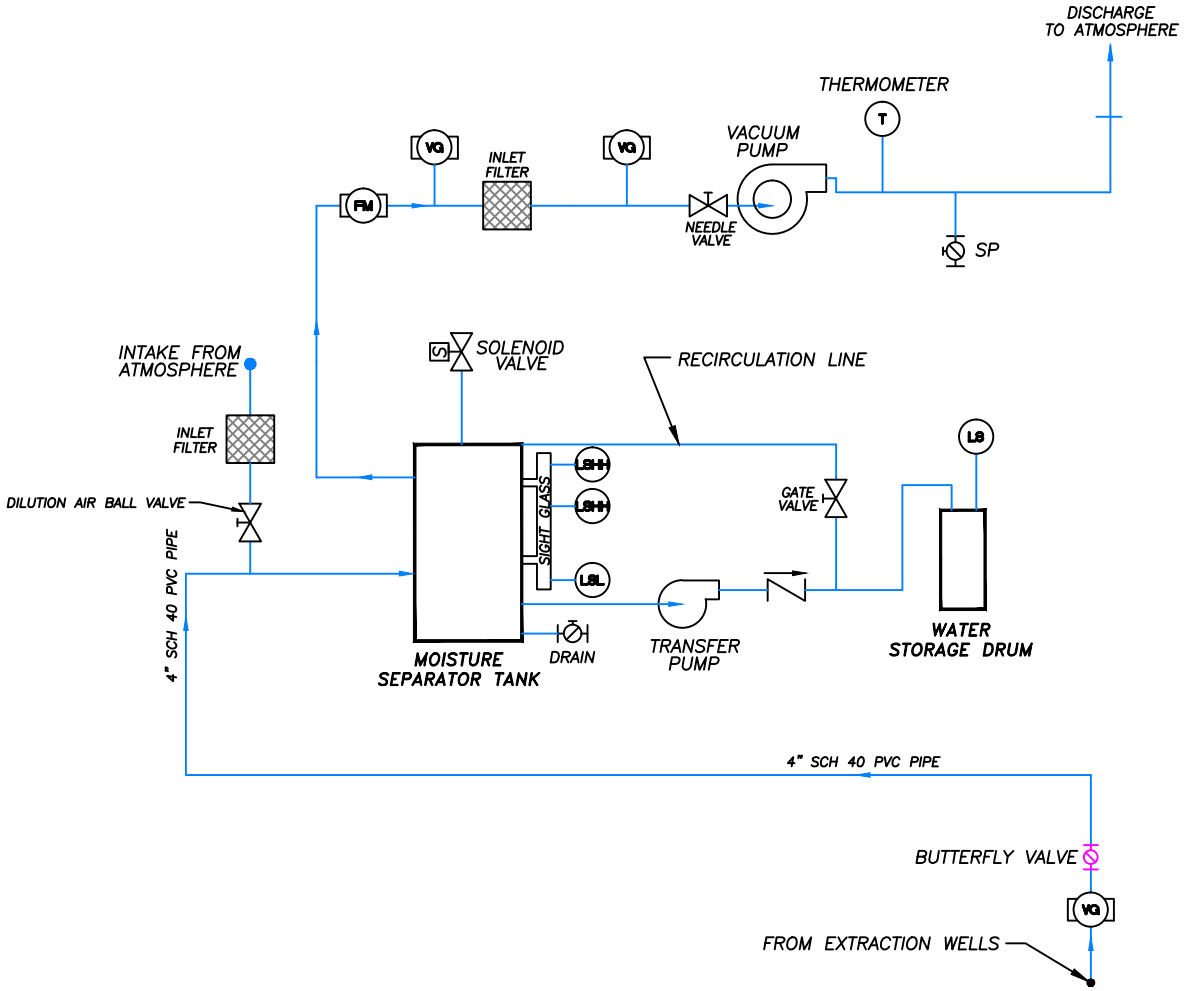

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PROCESS AND INSTRUMENTATION DIAGRAM FOR REMEDIATION SYSTEM
Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure
6
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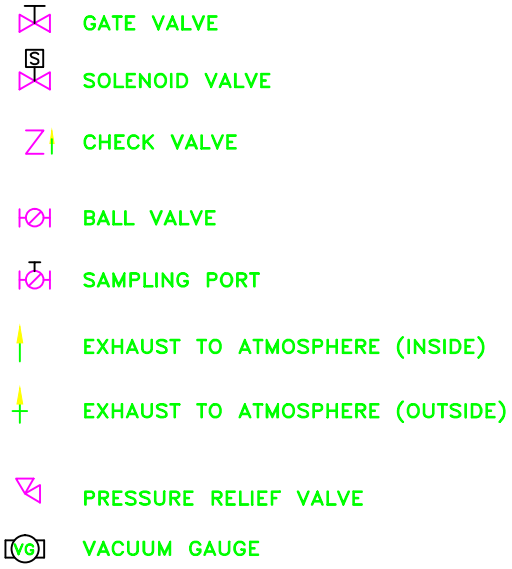
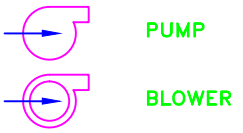
VALVE AND PIPING SYMBOLS



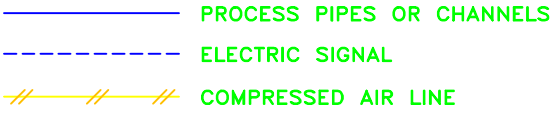
ABBREVIATIONS

DP	DIFFERENTIAL PRESSURE
DO	DISSOLVED OXYGEN
FC	FAIL CLOSED
FI	FAIL INDETERMINATE
FL	FAIL LOCKED
FO	FAIL OPEN
FQ	FAIL QUANTIFIER
HOA	HAND–OFF–AUTOMATIC
HS	HAND SWITCH
IL	INDICATOR LIGHT
I/I	CURRENT–TO–CURRENT
I/P	CURRENT–TO–PNEUMATIC
KC	PROGRAM CONTROLLER
LC	LEVEL CONTROLLER
LEL	LOWER EXPLOSIVE LIMIT
LR	LOCAL–REMOTE
LS	LEVEL SENSOR
LSHH, LSL, LSH	LIQUID SWITCH HIGH / LOW
M	MOTOR
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
P	PRESSURE
PI	PRESSURE INDICATOR
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
PRV	PRESSURE RELIEF VALVE
PSH	PRESSURE SWITCH – HIGH
SG	SIGHT GLASS
SP	SAMPLING PORT
UA	UNIVERSAL ALARM
FMT	FLOW METER TOTALIZER
AFM	AIR FLOW METER

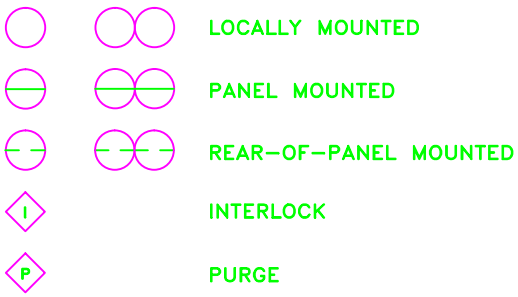
EQUIPMENT SYMBOLS



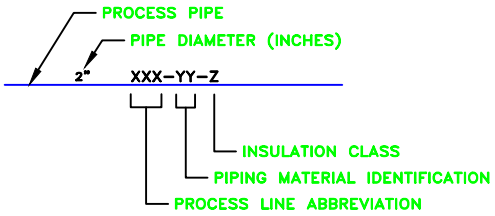
LINE SYMBOLS



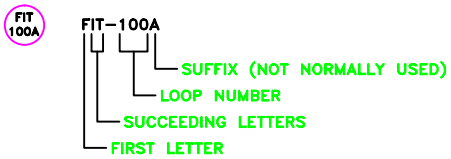
GENERAL INSTRUMENT SYMBOLS



PROCESS PIPING IDENTIFICATION



INSTRUMENT IDENTIFICATION



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PROCESS AND INSTRUMENTATION LEGEND
Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure	
7	
Project	
6165	

APPENDIX A

Conveyance Line Installation Photographs

SVE-2 with ball valve and clean out.

Looking southwest.

Trench excavation along south wall of building

Looking west.

Trench excavation

Looking east.

Conveyance piping set to 2 feet bgs. Soil added in trench and leveled off for the addition of R-board installation over the top of the PVC.

Looking east.

Adding 1 inch purple foam board (Polystyrene) over the conveyance line sections that are 2 feet bgs.

Looking east.

Ball valve and clean-out added to SVE-1, and pipe connecting the well to the main conveyance line.

Looking east.

Well vault set over SVE-1.

Looking north.

Above ground conveyance line installed on the east side of the building.

Looking east.

Conveyance line coming from SVE-2 to the trenched section on the south side of the building.

Looking north.

APPENDIX B

Operation, Maintenance, and Monitoring Plan

SOIL VAPOR EXTRACTION SYSTEM
OPERATION, MAINTENANCE, AND MONITORING PLAN

MARTINO'S MASTER CLEANERS
7513 41st AVENUE
KENOSHA, WISCONSIN 53142
WDNR BRRTS# 02-30-552188

May 29, 2018

Prepared For:

Martino's Master Dry Cleaners
7513 41st Avenue
Kenosha, Wisconsin 53142

Prepared By:

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FIGURES

APPENDICES

1.0 INTRODUCTION

A soil vapor extraction (SVE) system has been installed at the Martino's Master Dry Cleaners (Martino's) facility located at 7513 41st Avenue in Kenosha, Wisconsin (Site). The system is designed to remove tetrachloroethene (PCE) and associated vapors from the vadose zone in the unconsolidated sediment. Proper operation and maintenance of the SVE system is necessary to document remedial progress and to optimize system performance. This Operation and Maintenance plan (O&M Plan) has been prepared in accordance with Wisconsin Administrative Code (WAC) Chapter NR 724.

1.1 Site Information and Contacts

Property Information:
County: Kenosha
PLSS Location: NE ¼ of NE ¼ of Sec. 11, T1N, R22E
WTM Coords: X=695915, Y=234812
City of Kenosha Parcel #: 03-122-11-102-022

Property Owner/Responsible Party Information:
Owner Name: Dan Martino
Address: 7513 41st Avenue, Kenosha, WI 53142
Contacts: Dan Martino
Telephone: (262) 694-7858
E-mail Address: danmartinosr@aol.com

Consultant Information:
Company Name: EnviroForensics, LLC
Address: N16W23390 Stone Ridge Drive, Suite G, Waukesha, WI 53188
Contacts: Robert Hoverman - Senior Project Manager/ Brian Kappen – Project Manager
Telephone: (262) 290-4001
E-mail Address: rhoverman@enviroforensics.com/ bkappen@enviroforensics.com

WDNR Project Manager: Mr. Doug Cieslak
Address: 141 NW Barstow Street, Room 180, Waukesha, WI 53188
Telephone: (262) 574-2182
Email: Douglas.Cieslak@Wisconsin.gov

2.0 SYSTEM DESCRIPTION

2.1 Extraction Wells and Conveyance Piping

The SVE system consists of two (2) extraction wells screened in unconsolidated sediment. Polyvinyl chloride (PVC) conveyance piping connects the extraction wells to a vacuum pump and associated equipment and controls housed inside a skid-mounted steel enclosure positioned on the east side of the Site building. The extraction wells are constructed of 4-inch diameter Schedule 40 PVC pipe and Vee-Wire continuous wrap screen with 0.020-inch slots. The SVE wells are screened from 4 to 9 feet below ground surface (bgs).

A single 4-inch PVC conveyance line extends from the equipment enclosure to SVE-2, located inside the building, with a short branch connecting SVE-1 which is located in the parking lot on the south side of the building. A portion of the line is in a shallow trench along the south building wall; the remainder is above ground, mounted to interior pipe hangers and the exterior building wall. The extraction well locations and conveyance piping layout are depicted on **Figure 1**. Individual ball valves are also installed at each wellhead. Diagram of wellhead configurations are depicted on **Figures 2 and 3**.

A 24-inch square flush-mount, traffic-rated steel vault protects the SVE-1 wellhead and provides access to valve and vacuum measurement port. There is no vault covering the interior well (SVE-1). The well riser extends vertically through the concrete floor to a ball valve, then continues on as the conveyance line.

2.2 Mechanical Components

The mechanical system consists of the following components:

- Busch Mink MM 1502 claw vacuum pump with 20 HP motor
- Master Control Panel with Variable Frequency Drive (VFD) Controls
- 100 gallon air-water separator with probe level switches
- 1.5 hp transfer pump
- Secondary water storage drum with level sensor
- Inlet filter
- Dwyer air velocity transmitter.

The components are contained in a skid-mounted steel enclosure measuring approximately 10 feet long by 6 feet wide. The vacuum pump exhaust stack extends out the side of the enclosure to a height of 8 feet above ground surface. Exhaust samples are collected from a port in the stack downstream from the vacuum pump. A system process and instrumentation diagram and an associated legend are presented on **Figures 4 and 5**, respectively.

3.0 OPERATION AND MAINTENANCE

Operation and Maintenance (O&M) activities are conducted by EnviroForensics personnel to:

- Maximize system efficiency and contaminant mass removal rates;
- Keep the mechanical equipment in good working order; and
- Collect data to track system performance and determine a timeframe for shutdown.

3.1 System Operation

The vacuum pump is controlled by a VFD mounted on the control cabinet. The VFD can be operated at a range from 30 to 60 hertz (Hz). Refer to the System Operation Manual located at the Site for detailed information on operating the VFD.

The SVE system is designed to operate continuously. Either extraction well can be disconnected from service by closing the ball valve installed at the wellhead. This design allows the operators to target specific areas and/or depths as the remediation progresses to maximize efficiency. Operational changes are made as needed during the maintenance visits described below.

3.2 System Maintenance and Monitoring

Samples of the SVE system emissions are collected from a port in the exhaust stack downstream of the vacuum pump to calculate mass removal rates and cumulative mass removed; and to determine operational changes to optimize system performance. The samples are analyzed for VOCs by EPA test method TO-15. Performance monitoring is conducted in accordance with the following emissions testing schedule required under WAC Chapter 419.07:

- Once each day for the first 3 days of system operation;
- Weekly for the next 3 weeks; and
- Monthly thereafter.

Long-term maintenance activities will be performed monthly and include the following:

- Adjusting the operational configuration of the system (i.e., open or close wellhead valves);
- Addressing system shutdowns or operational issues;
- Inspection and replacement of the inlet air filter;
- Manage disposal of water collected in storage drum;
- Routine maintenance of the vacuum pump in accordance with manufacturer recommendations, including oil replacement;
- Recording operational parameters according to the table below:

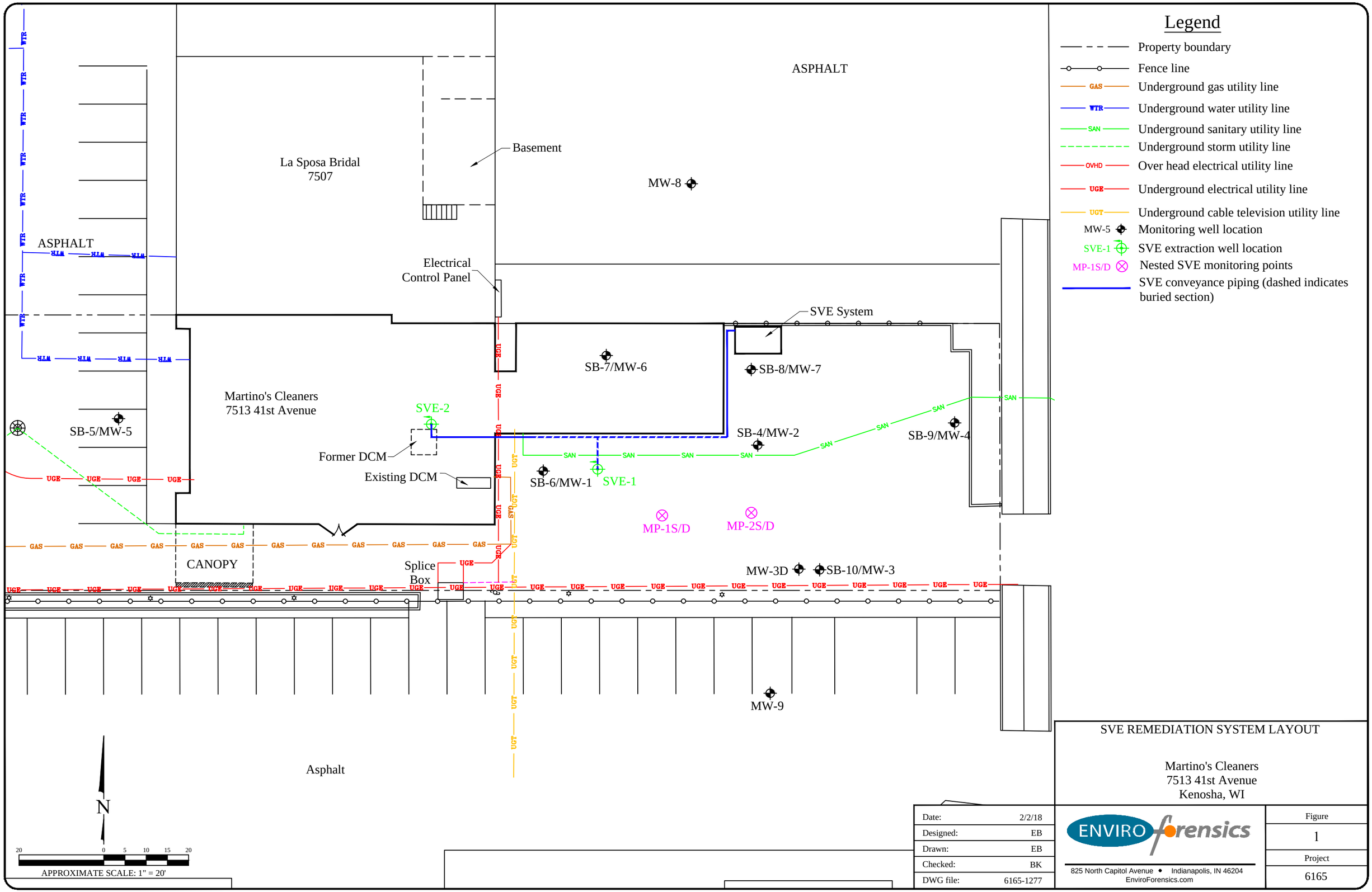
Parameter	Method	Frequency
Effluent VOC vapor concentration;	1-liter vacuum canister sample	Monthly
System runtime;	VFD reading	Monthly
System vacuum (max 12 in Hg);	Gauge reading	Monthly
Pre- and post-inlet filter vacuums	Gauge readings	Monthly
Flow rate;	Flow meter reading	Monthly
Exhaust temperature (max 180ºF);	Gauge Reading	Monthly
Wellhead vacuum;	Hand-held digital manometer	As needed
Vacuum at monitoring points;	Hand-held digital manometer	As needed

O&M information is recorded on the log presented in **Appendix A**. SVE wellhead and monitoring point locations are depicted on **Figure 1**.

4.0 REPORTING

Semi-annual remediation progress reports will be submitted to WDNR, as required, using the Remediation Site Operation, Maintenance, Monitoring & Optimization Report (WDNR Form 4400-194). The reports will include information on operational configuration during the reporting period, figures, tables, and graphs showing time versus contaminant removal and cumulative contaminant removal. The reporting periods each year are from January 1 to June 30 and July 1 to December 31. The deadline for submittal of progress reports is 30 days after the end of each reporting period.

FIGURES



SVE REMEDIATION SYSTEM LAYOUT

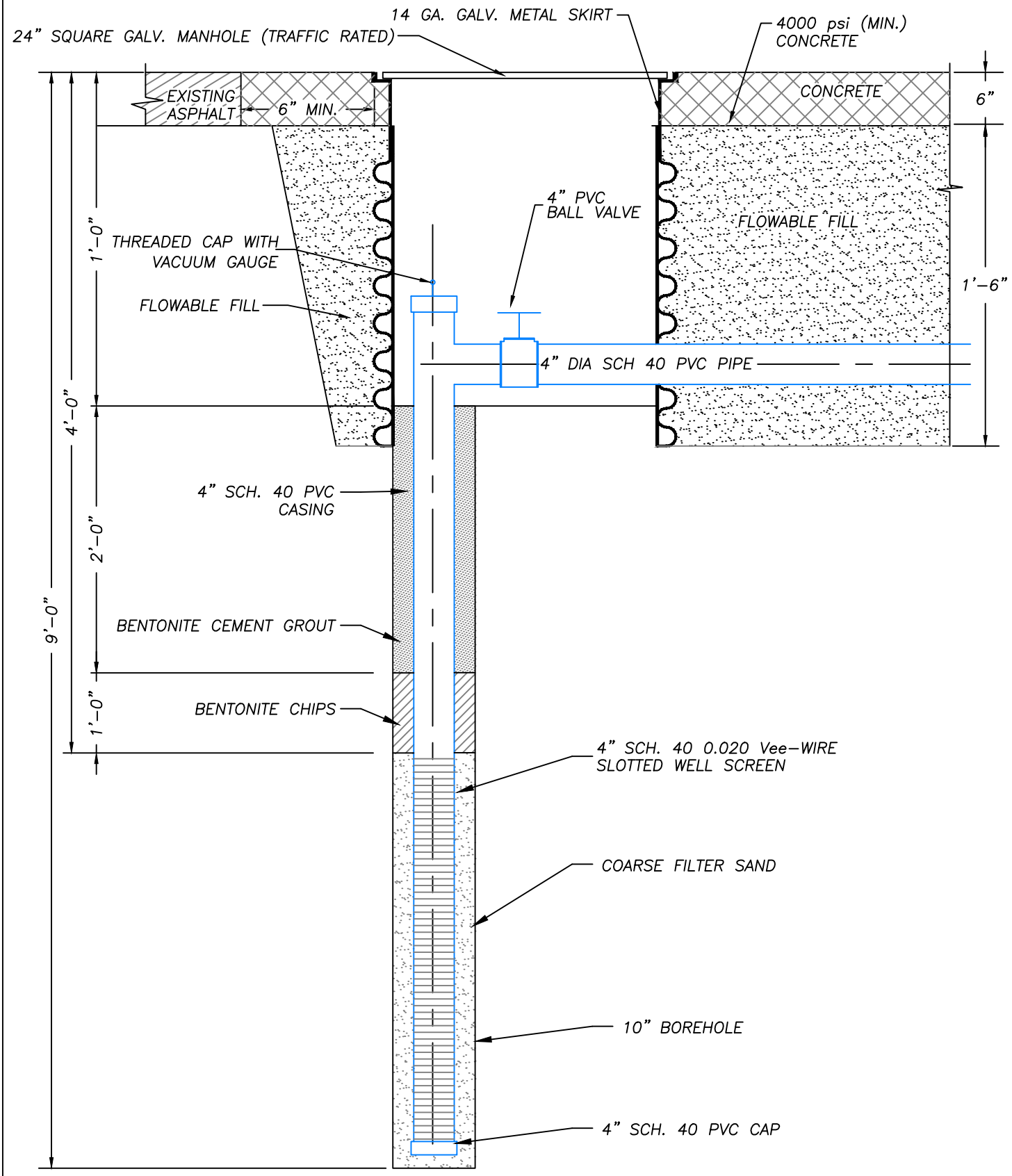
Martino's Cleaners
7513 41st Avenue
Kenosha, WI

Date:	2/2/18
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6165-1277

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure
1

Project
6165



No.	Date	Revision	Approved

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

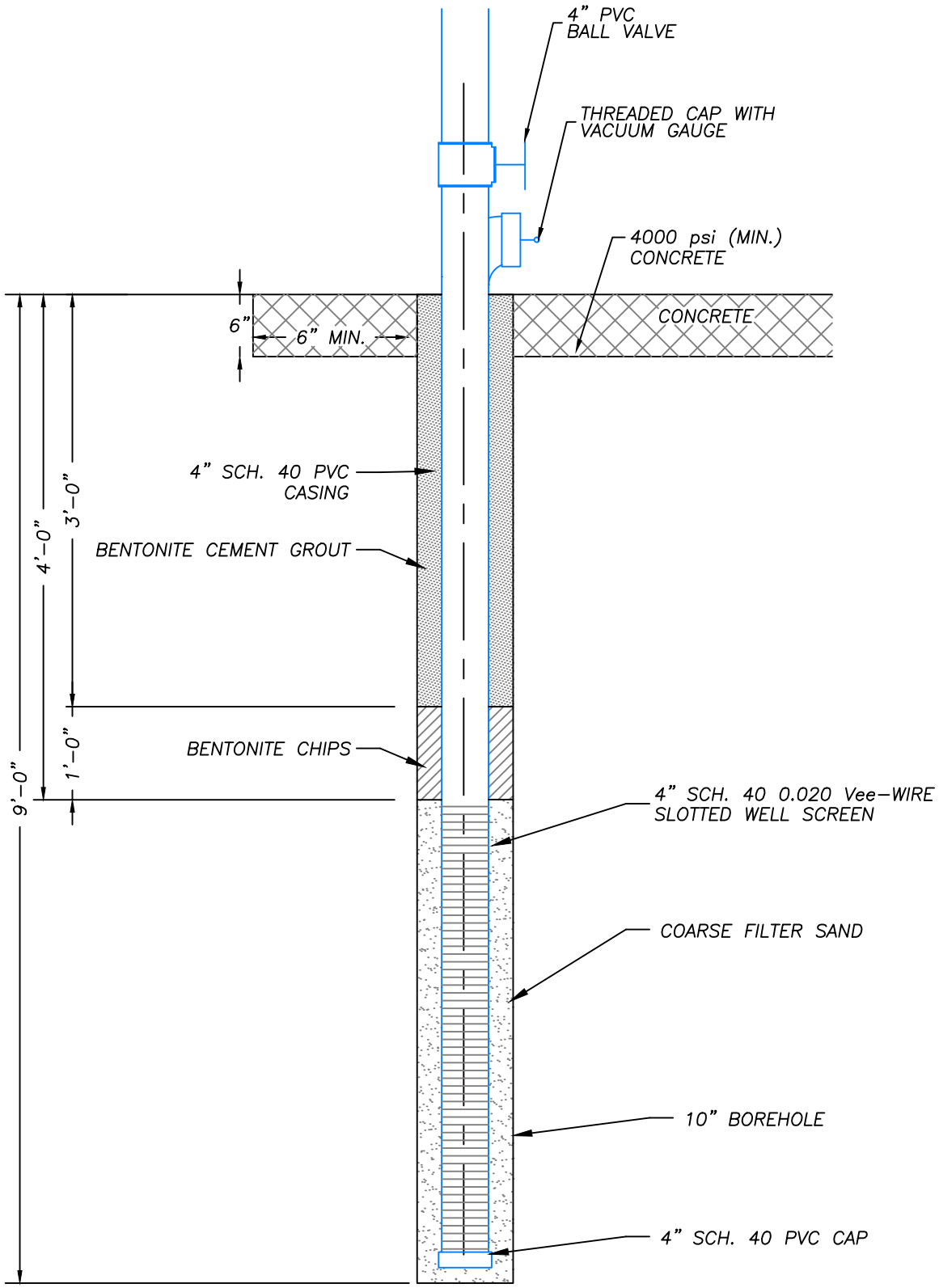
Date:	2/13/18
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6165-1440

SVE EXTERIOR WELLHEAD CONNECTION DIAGRAM

Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure 2

Project 6165



No.	Date	Revision	Approved

ENVIRO forensics
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EnviroForensics.com

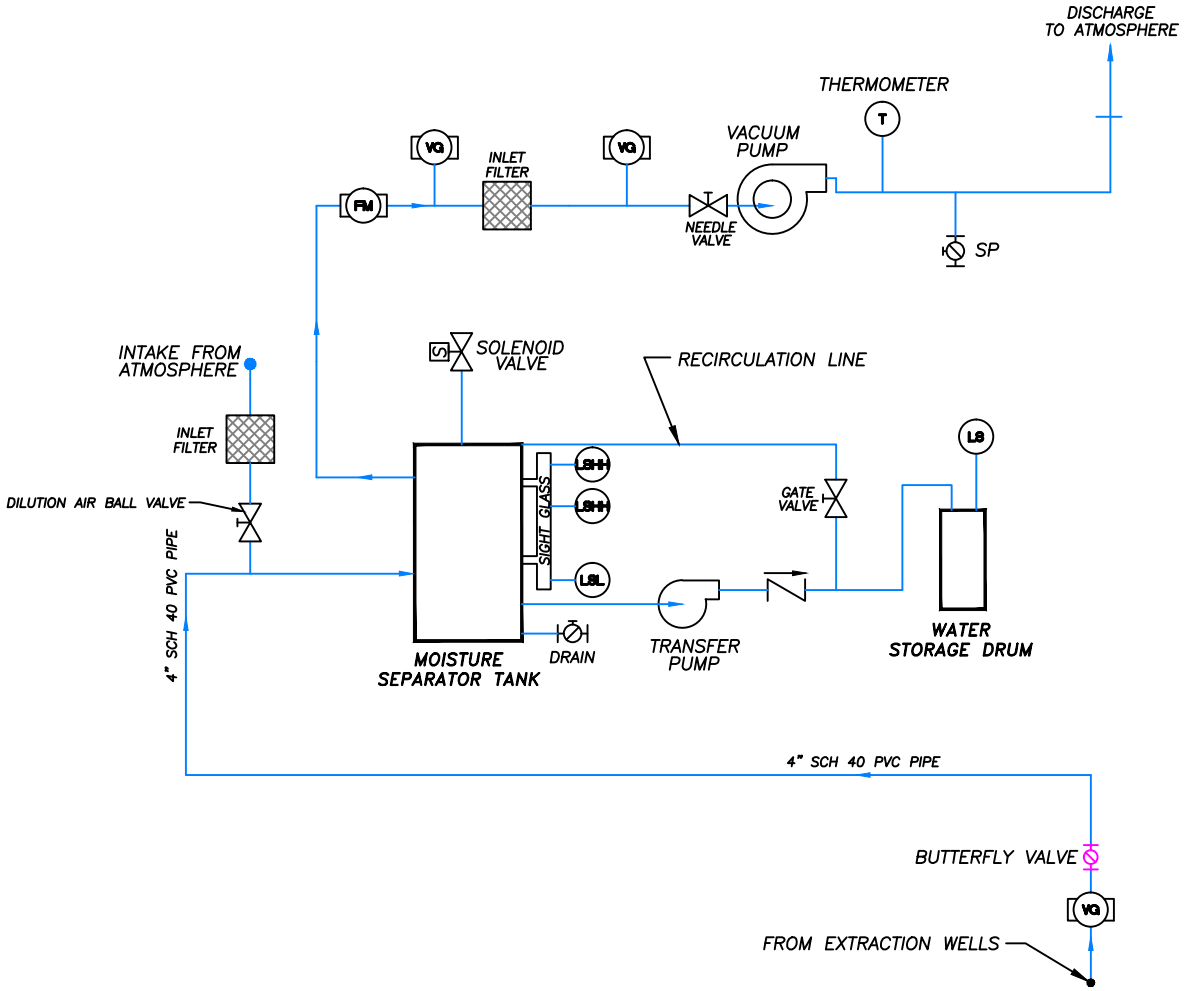
Date:	2/13/18
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6165-1440

SVE INTERIOR WELLHEAD CONNECTION DIAGRAM

Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure 3

Project 6165



No.	Date	Revision	Approved

ENVIRO forensics
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EnviroForensics.com

Date:	2/16/18
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6165-1440

PROCESS AND INSTRUMENTATION DIAGRAM FOR REMEDIATION SYSTEM
Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure 4

Project 6165

VALVE AND PIPING SYMBOLS

- GATE VALVE
- SOLENOID VALVE
- CHECK VALVE
- BALL VALVE
- SAMPLING PORT
- EXHAUST TO ATMOSPHERE (INSIDE)
- EXHAUST TO ATMOSPHERE (OUTSIDE)
- PRESSURE RELIEF VALVE
- VACUUM GAUGE

ABBREVIATIONS

DP	DIFFERENTIAL PRESSURE
DO	DISSOLVED OXYGEN
FC	FAIL CLOSED
FI	FAIL INDETERMINATE
FL	FAIL LOCKED
FO	FAIL OPEN
FQ	FAIL QUANTIFIER
HOA	HAND–OFF–AUTOMATIC
HS	HAND SWITCH
IL	INDICATOR LIGHT
I/I	CURRENT–TO–CURRENT
I/P	CURRENT–TO–PNEUMATIC
KC	PROGRAM CONTROLLER
LC	LEVEL CONTROLLER
LEL	LOWER EXPLOSIVE LIMIT
LR	LOCAL–REMOTE
LS	LEVEL SENSOR
LSHH, LSL, LSH	LIQUID SWITCH HIGH / LOW
M	MOTOR
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
P	PRESSURE
PI	PRESSURE INDICATOR
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
PRV	PRESSURE RELIEF VALVE
PSH	PRESSURE SWITCH – HIGH
SG	SIGHT GLASS
SP	SAMPLING PORT
UA	UNIVERSAL ALARM
FMT	FLOW METER TOTALIZER
AFM	AIR FLOW METER

EQUIPMENT SYMBOLS

- PUMP
- BLOWER

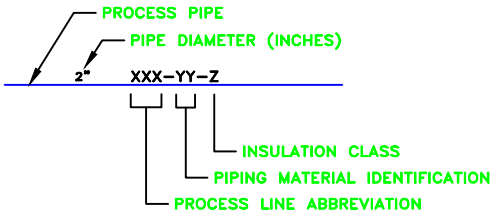
LINE SYMBOLS

- PROCESS PIPES OR CHANNELS
- ELECTRIC SIGNAL
- COMPRESSED AIR LINE

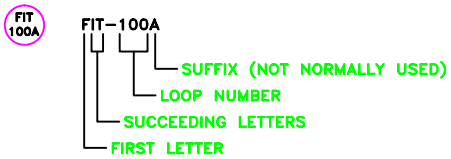
GENERAL INSTRUMENT SYMBOLS

- LOCALLY MOUNTED
- PANEL MOUNTED
- REAR–OF–PANEL MOUNTED
- INTERLOCK (I)
- PURGE (P)

PROCESS PIPING IDENTIFICATION



INSTRUMENT IDENTIFICATION



No.	Date	Revision	Approved

ENVIRO forensics
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EnviroForensics.com

Date:	2/16/18
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6165-1440

PROCESS AND INSTRUMENTATION LEGEND
Martino's Cleaners
7513 41st Avenue
Kenosha, Wisconsin

Figure 5

Project 6165

APPENDIX A

SVE System Operation and Maintenance Log

6165 SVE SYSTEM OPERATION

One Hour Martinizing - 7513 41st Street Kenosha

Logged By: _____

Date: _____ System Status: _____ Why: _____

SVE SYSTEM STATUS

AMBIENT TEMP. AND WEATHER:

	Time	System Runtime (Hr) {D016}	Intake Vac (in. Hg)	VFD Setting (Hz) {F001}	Influent Flow (FPM)	Effluent Air Temp (F)	Drum Volume (est. gallons)	Dilution (0-100 %)
In								

SYSTEM MONITORING POINTS (in. H_20)

Check if not taken _____

MW-1		MW-6		MP-1s			
MW-2		MW-7		MP-1d			
MW-3				MP-2s			
MW-4				MP-2d			

SVE SYSTEM INSPECTION

Pre-Filter Vac (in. Hg)	Post-Filter Vac (in. Hg)	Blower Grease C-Checked, R-Replaced	Blower Gear Oil C-Checked, R-Replaced	Inlet Air Filter C-Checked, R-Replaced	Dilution Air Filter C-Checked, R-Replaced	System Enclosure Secure?	System Enclosure Clean?

Extraction Points (in. Hg)

Check if not taken _____

SVE-1	
SVE-2	

Sample Collection

Check if not taken _____

Sample Location: _____

System Runtime at time of Sample: _____

Canister ID: _____ Flow Controller ID: _____

Pressure: Initial: _____ Time: Initial: _____

Final: _____ Final: _____

SVE SYSTEM STATUS

AMBIENT TEMP. AND WEATHER:

	Time	System Runtime (Hr) {D016}	Intake Vac (in. Hg)	VFD Setting (Hz) {F001}	Influent Flow (FPM)	Effluent Air Temp (F)	Drum Volume (est. gallons)	Dilution (0-100 %)
Out								

Notes

APPENDIX C

SVE System Commissioning Laboratory Report

EnvisionAir
1441 Sadlier Circle West Drive
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Fax: 317-351-0882
www.envision-air.com

Mr. Brian Kappen
Enviroforensics
N16 W. 23390 Stone Ridge Dr
Suite G
Waukesha, WI 53188

May 4, 2018

EnvisionAir Project Number: 2018-287
Client Project Name: 6165 / Martino's 41st

Dear Mr. Kappen,

Please find the attached analytical report for the samples received May 4, 2018. All test methods performed were fully compliant with local, state, and federal EPA methods unless otherwise noted. The project was analyzed as requested on the enclosed chain of custody record. Please review the comments section for additional information about your results or Quality Control data.

Feel free to contact me if you have any questions or comments regarding your analytical report or service.

Thank you for your business. EnvisionAir looks forward to working with you on your next project.

Yours Sincerely,

Stanley A Hunnicutt

Project Manager
EnvisionAir, LLC

EnvisionAir
1441 Sadlier Circle West Drive
Indianapolis, IN 46239
Ph: 317-351-0885
Fax: 317-351-0882
www.envision-air.com

Client Name: ENVIROFORENSICS

Project ID: 6165 / MARTINO'S 41ST

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2018-287

Sample Summary

Canister Pressure / Vacuum

Laboratory Sample Number:	Sample Description:	Matrix:	START Date Collected:	START Time Collected:	End Date Collected:	End Time Collected:	Date Received:	Time Received	Initial Field (in. Hg)	Final Field (in. Hg)	Lab Received (in. Hg)
18-1218	6165-SVE-OA-N	A	5/2/18	11:50	5/3/18	11:50	5/4/18	12:00	-29	-5	-5
18-1219	6165-SVE-OA-S	A	5/2/18	11:55	5/3/18	11:55	5/4/18	12:00	-29	-6	-6
18-1220	6165-SVE-EX	A	5/1/18	16:23			5/4/18	12:00	-23	-1	-1
18-1221	6165-SVE-EX	A	5/3/18	14:00			5/4/18	12:00	-28	-2	-2

EnvisionAir
1441 Sadlier Circle West Drive
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Fax: 317-351-0882
www.envision-air.com

Client Name: ENVIROFORENSICS

Project ID: 6165 / MARTINO'S 41ST

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2018-287

Analytical Method: TO-15
Analytical Batch: 050918AIR

Client Sample ID: 6165-SVE-OA-N

EnvisionAir Sample Number: 18-1218
Sample Matrix: AIR

Sample Collection START Date/Time: 5/2/18 11:50
Sample Collection END Date/Time: 5/3/18 11:50
Sample Received Date/Time: 5/4/18 12:00

Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
4-Ethyltoluene	< 492	492	
4-Methyl-2-pentanone (MIBK)	< 2050	2050	
1,1,1-Trichloroethane	< 546	546	
1,1,2,2-Tetrachloroethane	< 0.34	0.34	1
1,1,2-Trichloroethane	< 0.21	0.21	1
1,1-Dichloroethane	< 4.05	4.05	
1,1-Dichloroethene	< 198	198	
1,2,4-Trichlorobenzene	< 0.74	0.74	
1,2,4-Trimethylbenzene	< 4.92	4.92	
1,2-dibromoethane (EDB)	< 0.03	0.03	1
1,2-Dichlorobenzene	< 60.1	60.1	
1,2-Dichloroethane	< 0.40	0.40	
1,2-Dichloropropane	< 0.46	0.46	
1,3,5-Trimethylbenzene	< 4.92	4.92	
1,3-Butadiene	< 0.22	0.22	
1,3-Dichlorobenzene	< 60.1	60.1	
1,4-Dichlorobenzene	< 0.60	0.60	
1,4-Dioxane	< 1.80	1.80	
2-Butanone (MEK)	< 2950	2950	
2-Hexanone	< 20.5	20.5	
Acetone	< 2380	2380	
Benzene	< 1.60	1.60	
Benzyl Chloride	< 0.41	0.41	1
Bromodichloromethane	< 0.54	0.54	1
Bromoform	< 10.3	10.3	
Bromomethane	< 3.88	3.88	
Carbon Disulfide	< 311	311	
Carbon Tetrachloride	< 0.63	0.63	
Chlorobenzene	< 23.0	23.0	
Chloroethane	< 13.2	13.2	

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Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
Chloroform	< 0.83	0.83	
Chloromethane	< 20.6	20.6	
cis-1,2-Dichloroethene	< 19.8	19.8	
cis-1,3-Dichloropropene	< 4.54	4.54	
Cyclohexane	< 5510	5510	
Dibromochloromethane	< 0.85	0.85	
Dichlorodifluoromethane	< 49.5	49.5	
Ethyl Acetate	< 1800	1800	
Ethylbenzene	< 8.68	8.68	
Hexachloro-1,3-butadiene	< 1.07	1.07	
Isooctane	< 467	467	
m,p-Xylene	< 43.4	43.4	
Methylene Chloride	< 41.7	41.7	
Methyl-tert-butyl ether	< 36.1	36.1	
N-Heptane	< 410	410	
N-Hexane	< 176	176	
o-Xylene	< 43.4	43.4	
Propylene	< 172	172	
Styrene	< 426	426	
Tetrachloroethene	< 3.19	3.19	
Tetrahydrofuran	< 295	295	
Toluene	< 3770	3770	
trans-1,2-Dichloroethene	< 39.6	39.6	
trans-1,3-Dichloropropene	< 4.54	4.54	
Trichloroethene	< 1.07	1.07	
Trichlorofluoromethane	< 562	562	
Vinyl Acetate	< 176	176	
Vinyl Bromide	< 0.44	0.44	
Vinyl Chloride	< 1.28	1.28	
4-bromofluorobenzene (surrogate)	94%		
Analysis Date/Time:	5-9-18/10:15		
Analyst Initials	tjg		

EnvisionAir
1441 Sadlier Circle West Drive
Indianapolis, IN 46239
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Fax: 317-351-0882
www.envision-air.com

Client Name: ENVIROFORENSICS

Project ID: 6165 / MARTINO'S 41ST

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2018-287

Analytical Method: TO-15
Analytical Batch: 050918AIR

Client Sample ID: 6165-SVE-OA-S

EnvisionAir Sample Number: 18-1219
Sample Matrix: AIR

Sample Collection START Date/Time: 5/2/18 11:55
Sample Collection END Date/Time: 5/3/18 11:55
Sample Received Date/Time: 5/4/18 12:00

Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
4-Ethyltoluene	< 492	492	
4-Methyl-2-pentanone (MIBK)	< 2050	2050	
1,1,1-Trichloroethane	< 546	546	
1,1,2,2-Tetrachloroethane	< 0.34	0.34	1
1,1,2-Trichloroethane	< 0.21	0.21	1
1,1-Dichloroethane	< 4.05	4.05	
1,1-Dichloroethene	< 198	198	
1,2,4-Trichlorobenzene	< 0.74	0.74	
1,2,4-Trimethylbenzene	< 4.92	4.92	
1,2-dibromoethane (EDB)	< 0.03	0.03	1
1,2-Dichlorobenzene	< 60.1	60.1	
1,2-Dichloroethane	< 0.40	0.40	
1,2-Dichloropropane	< 0.46	0.46	
1,3,5-Trimethylbenzene	< 4.92	4.92	
1,3-Butadiene	< 0.22	0.22	
1,3-Dichlorobenzene	< 60.1	60.1	
1,4-Dichlorobenzene	< 0.60	0.60	
1,4-Dioxane	< 1.80	1.80	
2-Butanone (MEK)	< 2950	2950	
2-Hexanone	< 20.5	20.5	
Acetone	< 2380	2380	
Benzene	< 1.60	1.60	
Benzyl Chloride	< 0.41	0.41	1
Bromodichloromethane	< 0.54	0.54	1
Bromoform	< 10.3	10.3	
Bromomethane	< 3.88	3.88	
Carbon Disulfide	< 311	311	
Carbon Tetrachloride	< 0.63	0.63	
Chlorobenzene	< 23.0	23.0	
Chloroethane	< 13.2	13.2	

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Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
Chloroform	< 0.83	0.83	
Chloromethane	< 20.6	20.6	
cis-1,2-Dichloroethene	< 19.8	19.8	
cis-1,3-Dichloropropene	< 4.54	4.54	
Cyclohexane	< 5510	5510	
Dibromochloromethane	< 0.85	0.85	
Dichlorodifluoromethane	< 49.5	49.5	
Ethyl Acetate	< 1800	1800	
Ethylbenzene	< 8.68	8.68	
Hexachloro-1,3-butadiene	< 1.07	1.07	
Isooctane	< 467	467	
m,p-Xylene	< 43.4	43.4	
Methylene Chloride	< 41.7	41.7	
Methyl-tert-butyl ether	< 36.1	36.1	
N-Heptane	< 410	410	
N-Hexane	< 176	176	
o-Xylene	< 43.4	43.4	
Propylene	< 172	172	
Styrene	< 426	426	
Tetrachloroethene	< 3.19	3.19	
Tetrahydrofuran	< 295	295	
Toluene	< 3770	3770	
trans-1,2-Dichloroethene	< 39.6	39.6	
trans-1,3-Dichloropropene	< 4.54	4.54	
Trichloroethene	< 1.07	1.07	
Trichlorofluoromethane	< 562	562	
Vinyl Acetate	< 176	176	
Vinyl Bromide	< 0.44	0.44	
Vinyl Chloride	< 1.28	1.28	
4-bromofluorobenzene (surrogate)	84%		
Analysis Date/Time:	5-9-18/10:51		
Analyst Initials	tjg		

EnvisionAir
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www.envision-air.com

Client Name: ENVIROFORENSICS

Project ID: 6165 / MARTINO'S 41ST

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2018-287

Analytical Method: TO-15
Analytical Batch: 052118CAIR

Client Sample ID: 6165-SVE-EX
Sample Collection START Date/Time: 5/1/18 16:23
Sample Collection END Date/Time:
EnvisionAir Sample Number: 18-1220
Sample Received Date/Time: 5/4/18 12:00
Sample Matrix: AIR

Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
4-Ethyltoluene	< 4920	4920	
4-Methyl-2-pentanone (MIBK)	< 20500	20500	
1,1,1-Trichloroethane	< 5460	5460	
1,1,2,2-Tetrachloroethane	< 3.36	3.36	1
1,1,2-Trichloroethane	< 2.10	2.10	1
1,1-Dichloroethane	< 40.5	40.5	
1,1-Dichloroethene	< 1980	1980	
1,2,4-Trichlorobenzene	< 7.42	7.42	
1,2,4-Trimethylbenzene	< 49.2	49.2	
1,2-dibromoethane (EDB)	< 0.32	0.32	1
1,2-Dichlorobenzene	< 601	601	
1,2-Dichloroethane	< 4.05	4.05	
1,2-Dichloropropane	< 4.62	4.62	
1,3,5-Trimethylbenzene	< 49.2	49.2	
1,3-Butadiene	< 2.21	2.21	
1,3-Dichlorobenzene	< 601	601	
1,4-Dichlorobenzene	< 6.01	6.01	
1,4-Dioxane	< 18.0	18.0	
2-Butanone (MEK)	< 29500	29500	
2-Hexanone	< 205	205	
Acetone	< 23800	23800	
Benzene	**24.9**	16.0	
Benzyl Chloride	< 4.14	4.14	1
Bromodichloromethane	< 5.36	5.36	1
Bromoform	< 103	103	
Bromomethane	< 38.8	38.8	
Carbon Disulfide	< 3110	3110	
Carbon Tetrachloride	< 6.29	6.29	
Chlorobenzene	< 230	230	
Chloroethane	< 132	132	

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Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
Chloroform	**273**	8.30	
Chloromethane	< 206	206	
cis-1,2-Dichloroethene	**3,450**	3960	3,5
cis-1,3-Dichloropropene	< 45.4	45.4	
Cyclohexane	< 55100	55100	
Dibromochloromethane	< 8.52	8.52	
Dichlorodifluoromethane	< 495	495	
Ethyl Acetate	< 18000	18000	
Ethylbenzene	< 86.8	86.8	
Hexachloro-1,3-butadiene	< 10.7	10.7	
Isooctane	< 4670	4670	
m,p-Xylene	< 434	434	
Methylene Chloride	< 417	417	
Methyl-tert-butyl ether	< 361	361	
N-Heptane	< 4100	4100	
N-Hexane	< 1760	1760	
o-Xylene	< 434	434	
Propylene	< 1720	1720	
Styrene	< 4260	4260	
Tetrachloroethene	**86,500**	2550	4
Tetrahydrofuran	< 2950	2950	
Toluene	< 37700	37700	
trans-1,2-Dichloroethene	**703**	1590	2,5
trans-1,3-Dichloropropene	< 45.4	45.4	
Trichloroethene	**3,830**	215	3
Trichlorofluoromethane	< 5620	5620	
Vinyl Acetate	< 1760	1760	
Vinyl Bromide	< 4.37	4.37	
Vinyl Chloride	**491**	12.8	
4-bromofluorobenzene (surrogate)	100%		
Analysis Date/Time:	5-22-18/03:57		
Analyst Initials	tjg		

EnvisionAir
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Client Name: ENVIROFORENSICS

Project ID: 6165 / MARTINO'S 41ST

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2018-287

Analytical Method: TO-15
Analytical Batch: 052118CAIR

Client Sample ID: 6165-SVE-EX
Sample Collection START Date/Time: 5/3/18 14:00
Sample Collection END Date/Time:
EnvisionAir Sample Number: 18-1221
Sample Received Date/Time: 5/4/18 12:00
Sample Matrix: AIR

Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
4-Ethyltoluene	< 4920	4920	
4-Methyl-2-pentanone (MIBK)	< 20500	20500	
1,1,1-Trichloroethane	< 5460	5460	
1,1,2,2-Tetrachloroethane	< 3.36	3.36	1
1,1,2-Trichloroethane	< 2.10	2.10	1
1,1-Dichloroethane	< 40.5	40.5	
1,1-Dichloroethene	< 1980	1980	
1,2,4-Trichlorobenzene	< 7.42	7.42	
1,2,4-Trimethylbenzene	< 49.2	49.2	
1,2-dibromoethane (EDB)	< 0.32	0.32	1
1,2-Dichlorobenzene	< 601	601	
1,2-Dichloroethane	< 4.05	4.05	
1,2-Dichloropropane	< 4.62	4.62	
1,3,5-Trimethylbenzene	< 49.2	49.2	
1,3-Butadiene	< 2.21	2.21	
1,3-Dichlorobenzene	< 601	601	
1,4-Dichlorobenzene	< 6.01	6.01	
1,4-Dioxane	< 18.0	18.0	
2-Butanone (MEK)	< 29500	29500	
2-Hexanone	< 205	205	
Acetone	< 23800	23800	
Benzene	< 16.0	16.0	
Benzyl Chloride	< 4.14	4.14	1
Bromodichloromethane	< 5.36	5.36	1
Bromoform	< 103	103	
Bromomethane	< 38.8	38.8	
Carbon Disulfide	< 3110	3110	
Carbon Tetrachloride	< 6.29	6.29	
Chlorobenzene	< 230	230	
Chloroethane	< 132	132	

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Compounds	Sample Results ug/m³	Reporting Limit ug/m³	Flag
Chloroform	**150**	8.30	
Chloromethane	< 206	206	
cis-1,2-Dichloroethene	**3,160**	3960	3,5
cis-1,3-Dichloropropene	< 45.4	45.4	
Cyclohexane	< 55100	55100	
Dibromochloromethane	< 8.52	8.52	
Dichlorodifluoromethane	< 495	495	
Ethyl Acetate	< 18000	18000	
Ethylbenzene	< 86.8	86.8	
Hexachloro-1,3-butadiene	< 10.7	10.7	
Isooctane	< 4670	4670	
m,p-Xylene	< 434	434	
Methylene Chloride	< 417	417	
Methyl-tert-butyl ether	< 361	361	
N-Heptane	< 4100	4100	
N-Hexane	< 1760	1760	
o-Xylene	< 434	434	
Propylene	< 1720	1720	
Styrene	< 4260	4260	
Tetrachloroethene	**63,500**	2550	4
Tetrahydrofuran	< 2950	2950	
Toluene	< 37700	37700	
trans-1,2-Dichloroethene	**1,060**	1590	2,5
trans-1,3-Dichloropropene	< 45.4	45.4	
Trichloroethene	**3,750**	43.0	2
Trichlorofluoromethane	< 5620	5620	
Vinyl Acetate	< 1760	1760	
Vinyl Bromide	< 4.37	4.37	
Vinyl Chloride	**78.7**	12.8	
4-bromofluorobenzene (surrogate)	96%		
Analysis Date/Time:	5-22-18/05:09		
Analyst Initials	tjg		

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TO-15 Quality Control Data

EnvisionAir Batch Number: 050918AIR

Method Blank (MB):	MB Results (ppbv)	Reporting Limit (ppbv)	Flags
4-Ethyltoluene	< 100	100	
4-Methyl-2-pentanone (MIBK)	< 500	500	
1,1,1-Trichloroethane	< 100	100	
1,1,2,2-Tetrachloroethane	< 0.049	0.049	1
1,1,2-Trichloroethane	< 0.038	0.038	1
1,1-Dichloroethane	< 1	1	
1,1-Dichloroethene	< 50	50	
1,2,4-Trichlorobenzene	< 0.1	0.1	
1,2,4-Trimethylbenzene	< 1	1	
1,2-dibromoethane (EDB)	< 0.0041	0.0041	1
1,2-Dichlorobenzene	< 10	10	
1,2-Dichloroethane	< 0.1	0.1	
1,2-Dichloropropane	< 0.1	0.1	
1,3,5-Trimethylbenzene	< 1	1	
1,3-Butadiene	< 0.1	0.1	
1,3-Dichlorobenzene	< 10	10	
1,4-Dichlorobenzene	< 0.1	0.1	
1,4-Dioxane	< 0.5	0.5	
2-Butanone (MEK)	< 1000	1000	
2-Hexanone	< 5	5	
Acetone	< 1000	1000	
Benzene	< 0.5	0.5	
Benzyl Chloride	< 0.08	0.08	1
Bromodichloromethane	< 0.08	0.08	1
Bromoform	< 1	1	
Bromomethane	< 1	1	
Carbon Disulfide	< 100	100	
Carbon Tetrachloride	< 0.1	0.1	
Chlorobenzene	< 5	5	
Chloroethane	< 5	5	
Chloroform	< 0.17	0.17	
Chloromethane	< 10	10	
cis-1,2-Dichloroethene	< 5	5	
cis-1,3-Dichloropropene	< 1	1	
Cyclohexane	< 1600	1600	
Dibromochloromethane	< 0.1	0.1	
Dichlorodifluoromethane	< 10	10	
Ethyl Acetate	< 500	500	
Ethylbenzene	< 2	2	
Hexachloro-1,3-butadiene	< 0.1	0.1	
Isooctane	< 100	100	
m,p-Xylene	< 10	10	
Methylene Chloride	< 12	12	
Methyl-tert-butyl ether	< 10	10	
N-Heptane	< 100	100	
N-Hexane	< 50	50	
o-Xylene	< 10	10	
Propylene	< 100	100	
Styrene	< 100	100	
Tetrachloroethene	< 0.47	0.47	
Tetrahydrofuran	< 100	100	

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Method Blank (MB):	MB Results (ppbv)	Reporting Limit (ppbv)	Flags
Toluene	< 1000	1000	
trans-1,2-Dichloroethene	< 10	10	
trans-1,3-Dichloropropene	< 1	1	
Trichloroethene	< 0.2	0.2	
Trichlorofluoromethane	< 100	100	
Vinyl Acetate	< 50	50	
Vinyl Bromide	< 0.1	0.1	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	88%		
Analysis Date/Time:	5-9-18/10:20		
Analyst Initials	tjg		

LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	LCS/D Conc(ppbv)	LCS Rec.	LCSD Rec.	RPD	Flag
Propylene	10.9	8.91	10	109%	89%	20%	
Dichlorodifluoromethane	9.66	9.09	10	97%	91%	6.1%	
Chloromethane	9.67	9.61	10	97%	96%	0.6%	
Vinyl Chloride	9.08	8.96	10	91%	90%	1.3%	
1,3-Butadiene	10.5	9.49	10	105%	95%	10.1%	
Bromomethane	9.16	9.45	10	92%	95%	3.1%	
Chloroethane	10.1	9.37	10	101%	94%	7.5%	
Vinyl Bromide	9.82	8.76	10	98%	88%	11.4%	
Trichlorofluoromethane	11.1	10.1	10	111%	101%	9.4%	
Acetone	10.9	10.6	10	109%	106%	2.8%	
1,1-Dichloroethene	11	10.5	10	110%	105%	4.7%	
Methylene Chloride	9.7	9.84	10	97%	98%	1.4%	
Carbon Disulfide	10	9.94	10	100%	99%	0.6%	
trans-1,2-Dichloroethene	10	10	10	100%	100%	0.0%	
Methyl-tert-butyl ether	10.8	10.6	10	108%	106%	1.9%	
1,1-Dichloroethane	9.84	10.2	10	98%	102%	3.6%	
Vinyl Acetate	8.7	9.09	10	87%	91%	4.4%	
N-Hexane	8.76	8.95	10	88%	90%	2.1%	
2-Butanone (MEK)	9.09	9.59	10	91%	96%	5.4%	
cis-1,2-Dichloroethene	10.5	10.8	10	105%	108%	2.8%	
Ethyl Acetate	8.49	8.93	10	85%	89%	5.1%	
Chloroform	10.3	10.6	10	103%	106%	2.9%	
Tetrahydrofuran	10.7	10.8	10	107%	108%	0.9%	
1,2-Dichloroethane	11.1	11.1	10	111%	111%	0.0%	
1,1,1-Trichloroethane	10.7	10.6	10	107%	106%	0.9%	
Carbon Tetrachloride	10.5	10.5	10	105%	105%	0.0%	
Benzene	9.82	9.92	10	98%	99%	1.0%	
Cyclohexane	10.6	10.6	10	106%	106%	0.0%	
1,2-Dichloropropane	9.72	10.1	10	97%	101%	3.8%	
Trichloroethene	10	10.1	10	100%	101%	1.0%	
Bromodichloromethane	10.6	10.7	10	106%	107%	0.9%	
1,4-Dioxane	10.5	11.1	10	105%	111%	5.6%	
Isooctane	8.82	9.14	10	88%	91%	3.6%	
N-Heptane	9.42	9.49	10	94%	95%	0.7%	
cis-1,3-Dichloropropene	11.3	11.5	10	113%	115%	1.8%	
4-Methyl-2-pentanone (MIBK)	10.6	11.1	10	106%	111%	4.6%	
trans-1,3-Dichloropropene	11.6	11.7	10	116%	117%	0.9%	
1,1,2-Trichloroethane	11.2	11.7	10	112%	117%	4.4%	
Toluene	11.1	11.4	10	111%	114%	2.7%	
2-Hexanone	11.8	10.5	10	118%	105%	11.7%	
Dibromochloromethane	8.72	8.65	10	87%	87%	0.8%	
1,2-dibromoethane (EDB)	8.57	8.59	10	86%	86%	0.2%	
Tetrachloroethene	8.86	9	10	89%	90%	1.6%	
Chlorobenzene	8.66	8.63	10	87%	86%	0.3%	
Ethylbenzene	9.22	9.05	10	92%	91%	1.9%	
m,p-Xylene	19.7	19.3	20	99%	97%	2.1%	
Bromoform	9.7	9.64	10	97%	96%	0.6%	

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Analytical Report

LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	LCS/D Conc(ppbv)	LCS Rec.	LCSD Rec.	RPD	Flag
Styrene	10.6	10.4	10	106%	104%	1.9%	
1,1,2,2-Tetrachloroethane	9.05	8.97	10	91%	90%	0.9%	
o-Xylene	10.5	10.2	10	105%	102%	2.9%	
4-Ethyltoluene	11.2	10.9	10	112%	109%	2.7%	
1,3,5-Trimethylbenzene	9.94	9.91	10	99%	99%	0.3%	
1,2,4-Trimethylbenzene	11.2	11	10	112%	110%	1.8%	
1,3-Dichlorobenzene	11	11	10	110%	110%	0.0%	
Benzyl Chloride	11.1	11.6	10	111%	116%	4.4%	
1,4-Dichlorobenzene	11.6	11.4	10	116%	114%	1.7%	
1,2-Dichlorobenzene	10.8	10.5	10	108%	105%	2.8%	
1,2,4-Trichlorobenzene	10.4	11.2	10	104%	112%	7.4%	
Hexachloro-1,3-butadiene	11.1	10.8	10	111%	108%	2.7%	
4-bromofluorobenzene (surrogate)	97%	94%					
Analysis Date/Time:	5-9-18/09:05	5-9-18/09:45					
Analyst Initials	tjg	tjg					

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Analytical Report

TO-15 Quality Control Data

EnvisionAir Batch Number: 052118CAIR

Method Blank (MB):	MB Results (ppbv)	Reporting Limit (ppbv)	Flags
4-Ethyltoluene	< 100	100	
4-Methyl-2-pentanone (MIBK)	< 500	500	
1,1,1-Trichloroethane	< 100	100	
1,1,2,2-Tetrachloroethane	< 0.049	0.049	1
1,1,2-Trichloroethane	< 0.038	0.038	1
1,1-Dichloroethane	< 1	1	
1,1-Dichloroethene	< 50	50	
1,2,4-Trichlorobenzene	< 0.1	0.1	
1,2,4-Trimethylbenzene	< 1	1	
1,2-dibromoethane (EDB)	< 0.0041	0.0041	1
1,2-Dichlorobenzene	< 10	10	
1,2-Dichloroethane	< 0.1	0.1	
1,2-Dichloropropane	< 0.1	0.1	
1,3,5-Trimethylbenzene	< 1	1	
1,3-Butadiene	< 0.1	0.1	
1,3-Dichlorobenzene	< 10	10	
1,4-Dichlorobenzene	< 0.1	0.1	
1,4-Dioxane	< 0.5	0.5	
2-Butanone (MEK)	< 1000	1000	
2-Hexanone	< 5	5	
Acetone	< 1000	1000	
Benzene	< 0.5	0.5	
Benzyl Chloride	< 0.08	0.08	1
Bromodichloromethane	< 0.08	0.08	1
Bromoform	< 1	1	
Bromomethane	< 1	1	
Carbon Disulfide	< 100	100	
Carbon Tetrachloride	< 0.1	0.1	
Chlorobenzene	< 5	5	
Chloroethane	< 5	5	
Chloroform	< 0.17	0.17	
Chloromethane	< 10	10	
cis-1,2-Dichloroethene	< 5	5	
cis-1,3-Dichloropropene	< 1	1	
Cyclohexane	< 1600	1600	
Dibromochloromethane	< 0.1	0.1	
Dichlorodifluoromethane	< 10	10	
Ethyl Acetate	< 500	500	
Ethylbenzene	< 2	2	
Hexachloro-1,3-butadiene	< 0.1	0.1	
Isooctane	< 100	100	
m,p-Xylene	< 10	10	
Methylene Chloride	< 12	12	
Methyl-tert-butyl ether	< 10	10	
N-Heptane	< 100	100	
N-Hexane	< 50	50	
o-Xylene	< 10	10	
Propylene	< 100	100	
Styrene	< 100	100	
Tetrachloroethene	< 0.47	0.47	
Tetrahydrofuran	< 100	100	

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Method Blank (MB):	MB Results (ppbv)	Reporting Limit (ppbv)	Flags
Toluene	< 1000	1000	
trans-1,2-Dichloroethene	< 10	10	
trans-1,3-Dichloropropene	< 1	1	
Trichloroethene	< 0.2	0.2	
Trichlorofluoromethane	< 100	100	
Vinyl Acetate	< 50	50	
Vinyl Bromide	< 0.1	0.1	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	95%		
Analysis Date/Time:	5-22-18/00:52		
Analyst Initials	tjg		

LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	LCS/D Conc(ppbv)	LCS Rec.	LCSD Rec.	RPD	Flag
Propylene	9.7	10.1	10	97%	101%	4.0%	
Dichlorodifluoromethane	8.96	9.15	10	90%	92%	2.1%	
Chloromethane	9.32	9.91	10	93%	99%	6.1%	
Vinyl Chloride	8.81	10.2	10	88%	102%	14.6%	
1,3-Butadiene	9.31	10	10	93%	100%	7.1%	
Bromomethane	8.79	9.56	10	88%	96%	8.4%	
Chloroethane	9.72	10.2	10	97%	102%	4.8%	
Vinyl Bromide	9.18	9.7	10	92%	97%	5.5%	
Trichlorofluoromethane	9.62	10	10	96%	100%	3.9%	
Acetone	10.6	10.8	10	106%	108%	1.9%	
1,1-Dichloroethene	10.7	11.2	10	107%	112%	4.6%	
Methylene Chloride	10	11.1	10	100%	111%	10.4%	
Carbon Disulfide	10.9	11.6	10	109%	116%	6.2%	
trans-1,2-Dichloroethene	10.3	11	10	103%	110%	6.6%	
Methyl-tert-butyl ether	11.8	9.97	10	118%	100%	16.8%	
1,1-Dichloroethane	10.6	11.1	10	106%	111%	4.6%	
Vinyl Acetate	10.5	10.8	10	105%	108%	2.8%	
N-Hexane	9.9	10.7	10	99%	107%	7.8%	
2-Butanone (MEK)	11.1	11.3	10	111%	113%	1.8%	
cis-1,2-Dichloroethene	10.2	10.6	10	102%	106%	3.8%	
Ethyl Acetate	10.5	11.2	10	105%	112%	6.5%	
Chloroform	10.2	10.5	10	102%	105%	2.9%	
Tetrahydrofuran	10.6	11.7	10	106%	117%	9.9%	
1,2-Dichloroethane	10.2	11.6	10	102%	116%	12.8%	
1,1,1-Trichloroethane	9.8	11.1	10	98%	111%	12.4%	
Carbon Tetrachloride	9.58	11.1	10	96%	111%	14.7%	
Benzene	10.2	11.7	10	102%	117%	13.7%	
Cyclohexane	9.9	11.6	10	99%	116%	15.8%	
1,2-Dichloropropane	9.68	11.1	10	97%	111%	13.7%	
Trichloroethene	9.58	10.7	10	96%	107%	11.0%	
Bromodichloromethane	9.74	11.1	10	97%	111%	13.1%	
1,4-Dioxane	10.8	11.7	10	108%	117%	8.0%	
Isooctane	10.2	11.9	10	102%	119%	15.4%	
N-Heptane	9.75	11	10	98%	110%	12.0%	
cis-1,3-Dichloropropene	10	11.5	10	100%	115%	14.0%	
4-Methyl-2-pentanone (MIBK)	10.9	10.5	10	109%	105%	3.7%	
trans-1,3-Dichloropropene	9.96	11.2	10	100%	112%	11.7%	
1,1,2-Trichloroethane	9.6	10.6	10	96%	106%	9.9%	
Toluene	9.81	11.3	10	98%	113%	14.1%	
2-Hexanone	10.8	10.7	10	108%	107%	0.9%	
Dibromochloromethane	9.98	10.9	10	100%	109%	8.8%	
1,2-dibromoethane (EDB)	10	10.7	10	100%	107%	6.8%	
Tetrachloroethene	9.68	10.5	10	97%	105%	8.1%	
Chlorobenzene	9.81	10.7	10	98%	107%	8.7%	
Ethylbenzene	10	10.8	10	100%	108%	7.7%	
m,p-Xylene	19.6	21.4	20	98%	107%	8.8%	
Bromoform	9.98	10.9	10	100%	109%	8.8%	

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Analytical Report

LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	LCS/D Conc(ppbv)	LCS Rec.	LCSD Rec.	RPD	Flag
Styrene	10.3	11.2	10	103%	112%	8.4%	
1,1,2,2-Tetrachloroethane	9.5	10.1	10	95%	101%	6.1%	
o-Xylene	9.91	10.7	10	99%	107%	7.7%	
4-Ethyltoluene	9.61	10.3	10	96%	103%	6.9%	
1,3,5-Trimethylbenzene	9.19	9.83	10	92%	98%	6.7%	
1,2,4-Trimethylbenzene	9.3	10	10	93%	100%	7.3%	
1,3-Dichlorobenzene	9.79	10.6	10	98%	106%	7.9%	
Benzyl Chloride	11.6	10.7	10	116%	107%	8.1%	
1,4-Dichlorobenzene	10.1	11	10	101%	110%	8.5%	
1,2-Dichlorobenzene	9.58	10.3	10	96%	103%	7.2%	
1,2,4-Trichlorobenzene	10	11.1	10	100%	111%	10.4%	
Hexachloro-1,3-butadiene	8.86	9.41	10	89%	94%	6.0%	
4-bromofluorobenzene (surrogate)	107%	106%					
Analysis Date/Time:	5-21-18/23:37	5-22-18/00:18					
Analyst Initials	tjg	tjg					

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Flag Number	Comments
1	Reporting limit is supported by MDL. TJG
2	Reported value is from a 40x dilution. TJG 5/23/18
3	Reported value is from a 200x dilution. TJG 5/23/18
4	Reported value is from an 800x dilution. TJG 5/23/18
5	Reported value is below the reporting limit but above the MDL. TJG 5/23/18

EnvisionAir Proj#: 2018-287 Page 1 of 1

CHAIN OF CUSTODY RECORD

EnvisionAir | 1441 Sadlier Circle West Drive | Indianapolis, IN 46239 | Phone: (317) 351-0885 | Fax: (317) 351-0882

Client: EnviroForensics	P.O. Number: 2018-0654
Report Address: bkappen@enviroforensics.com	Project Name or Number: 6165 Martino's 41st
Report To: B. Kappen	Sampled by: KVH / BK
Phone: 262-290-4001	QA/QC Required: (circle if applicable) Level III (Level IV)
Invoice Address: accountspayable@enviroforensics.com	Reporting Units needed: (circle) (ug/m³) mg/m³ PPBV PPMV
Desired TAT: (Please Circle One) 1 day 2 days 3 days (Std (5 bus. days))	Media type: 1LC = 1 Liter Canister; 6LC = 6 Liter Canister; TB = Tedlar Bag; TD = Thermal Desorption Tube

REQUESTED PARAMETERS

TO-15 Full List | TO-15 Short List (Specify in notes) | Canister Pressure / Vacuum

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Sampling Type:
Soil-Gas: ☒
Sub-Slab: ☐
Indoor-Air: ☒

Air Sample ID	Media Type (see code above)	Coll. Date (Grab/Comp Start)	Coll. Time (Grab/Comp Start)	Coll. Date (Comp. End)	Coll. Time (Comp. End)	TO-15 Full List	TO-15 Short List (Specify in notes)	Canister Pressure / Vacuum		Canister Serial #	Flow Controller Serial #	Initial Field (in. Hg)	Final Field (in. Hg)	Lab Received (in. Hg)	EnvisionAir Sample Number
6165-SVE-OA-N	6LC	5/2/18	1150	5/3/18	1150	X				4685	07750	-29	-5	-5	18-1218
6165-SVE-OA-S	6LC	5/2/18	1155	5/3/18	1155	X				19622	08014	-29	-6	-6	18-1219
6165-SVE-EX	1LC	5/1/18	1623			X				2095	0047	-23	-1	-1	18-1220
6165-SVE-EX	1LC	5/3/18	1400			X				83818	0090	-28	-2	-2	18-1221

Comments: Level III QA/QC on 6LC only

Relinquished by:	Date	Time	Received by:	Date	Time
B. Kappen	5/4/18	1200	Fed Ex	5/4/18	1200