



September 3, 2010

- *Engineering*
- *Remediation*
- *Consulting*

Mr. James Richmond
Maryland Department of the Environment
Oil Control Program
1800 Washington Boulevard
Baltimore, Maryland 21230

Re: **Carroll County Storm Water Comments**
Sheetz Store #177
3281 Main Street
Manchester, Maryland
MDE Case # 06-0056CL
MDE Facility ID No. 6297

Dear Mr. Richmond:

Environmental Alliance, Inc. (Alliance) on behalf of Sheetz, Inc. submitted a CAP Addendum (CAPA) Modification dated July 2, 2010. Alliance understands that the Carroll County Storm Water Engineer has reviewed the information related to the infiltration gallery that has been designed to handle double the discharge rate from the proposed groundwater remediation system. The following letter outlines the comments from Carroll County (outlined in an e-mail from Hugh Murphy to Jim Richmond dated July 28, 2010) and subsequent responses.

1. The details on page II-5 are incomplete. The information galleries should have one foot of C-33 sand on the bottom to prevent clogging as long as possible. In addition, a non-woven geotextile is necessary between the stone reservoir and the surrounding ground to keep soil from clogging the voids. Please see detail on Page 64 of the Supplement.

Response: The design has been updated to include the one foot of C-33 sand on the bottom of the gallery and the non-woven geotextile fabric. The revised drawings are included in Attachment I, see Figure II-5 for these revisions.

2. A piezometer and a float switch are shown on II-5. Detail II-3 shows manual gate valves. What is the float switch to control? There is no control circuit shown.

Response: The float switch located in a piezometers will control the flow of water into the infiltration gallery. If the water level gets too high, the float switch will shut off the remediation

system so that no more water is pumped to the infiltration gallery. The manual gate valves located in the remediation shed (part of Figure II-3) manually control which infiltration gallery (A or B) is receiving water from the remediation system. The control circuit for all alarms is a complete remediation system shut down with electronic notification to our office of an alarm condition. With a complete system shut down the transfer pumps are shut down so that no water is transferred from the air stripper through the carbon vessels, nor is water transferred from the holding tank to the stripper and the blower to the air stripper is also shut down. The air compressor is also shut down so that no water will be transferred from the groundwater pumps located in the recovery wells. With the float switch initiating a complete system shut down with notification, Alliance will be able to visit the site within short notice and assess the condition which caused the shut down and evaluate the appropriate response and start up of the system, if warranted by site conditions.

3. The infiltration galleries are each adequate to pass the design flow provided that the very marginal infiltration rate is not further reduced. It is normal practice to use the galleries one at a time to allow the infiltration capacity to recover. This needs to occur via a control circuit.

Response: At this time, the water transferred from the remediation shed to the infiltration galleries will be controlled manually. The galleries will only be used one at a time. As per MDE guidance, the system will be monitored daily for the first week, weekly for the first month and then bi-weekly (every other week) during the regular operation and maintenance (O&M) program. If during the initial phase of monitoring or at any time thereafter it is discovered that the system is shutting down due to high water in the infiltration gallery, then a modification may be made. Based on the 100% overdesign, we are not currently anticipating this problem, but are prepared to make modifications, if necessary. The system can be stopped with the float switch in the infiltration galleries and with various pressure gauges in line with the system which prevent the threat of water backing up somewhere in the system and overflowing like a storm water event, therefore the need for a control circuit is not deemed necessary at this time.

4. What is the “emergency floor sump” and where is it located?

Response: The emergency floor sump is in the floor of the remediation shed, slightly below grade, and will shut down the remediation system if water is detected on the floor of the shed as a fail safe switch due to an unlikely tank overflow or rupture.

5. If the galleries become full will the control circuit shut the system down or will it overflow on the ground? If so where?

Response: As described above, if the galleries are full, the entire system will shut down. No overflow will occur to the ground or anywhere else.

6. We normally assume a 4:1 phreatic line when designing underground infiltration systems. Is 20 feet between seven-foot high galleries enough to provide independent operation? I suspect that they need to be further apart.

Response: The design has been revised as indicated in the attached drawings (Attachment I, Figure II-1). In order to meet the 4:1 ratio for gallery separation, based on the property dimensions, the galleries were resized to meet the Carroll County requirements. The new infiltration galleries will be 20 feet wide by 115 feet long and are still seven feet deep. The galleries will be set a minimum of 30 feet apart.

If you have any questions regarding this request or further information is required, please contact Bill Smith at (302) 234-4400 or myself at (410) 729-9000. Thank you for your time.

Sincerely,
ENVIRONMENTAL ALLIANCE, INC.

Carianne A. Finch
Professional Engineer

William Smith, P.G.
Principal Hydrogeologist

Attachments

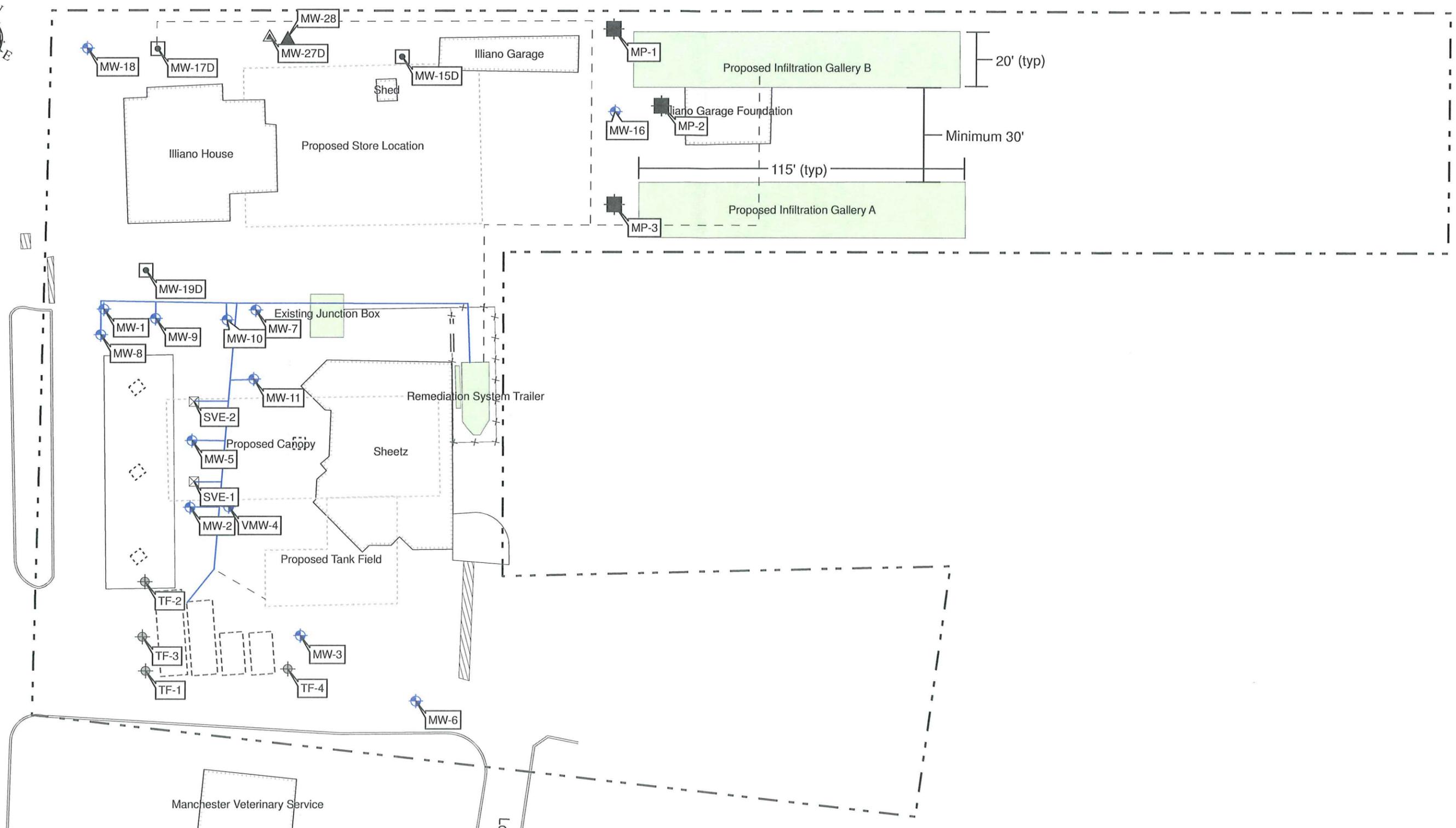
- Attachment I:** Modified Design Drawings
Figure II-1: Remediation System Layout
Figure II-2: Process & Instrumentation Diagram Legend
Figure II-3: Process & Instrumentation Diagram (Groundwater Recovery/Treatment System)
Figure II-4: Process & Instrumentation Diagram (SVE Treatment System)
Figure II-5: Infiltration Gallery Cross Section and Monitoring Point Details

- c: Mr. David Dodson, Sheetz, Inc. (one copy plus CD)
Ms. Susan Bull, MDE – Oil Control (one copy plus CD)
Mr. Chris Ralston, MDE – Oil Control (one copy)
Mr. Edwin Singer, Carroll County Health Department (CD only)
Mr. Steve Miller, Town of Manchester (CD only)
Mr. Warren Fox, XL Insurance (one copy plus CD)
Mr. Hugh Murphy, Carroll County (CD only)
Mr. John Grace, MDE Water Supply (CD only)
Mr. Peter Garey, Garey Business Center (CD only)

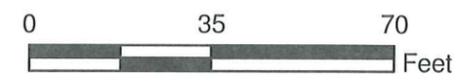
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ATTACHMENT I

Wednesday, April 28, 2010 10:22:10 AM • G:\EAI Projects\PCG Projects\Sheetz\2486-Manchester\2486-Maps\2486-remediation system layout 2-10.mxd



Legend			
	Proposed Monitoring Well		Shallow Well
	Proposed Cluster Monitoring Well		Tank Field Well
	Infiltration Gallery Monitoring Point (Figure II-5)		Potable Well
	Deep Well		Soil Vapor Point
	Gate		Existing Piping
	Building		Proposed Piping
	Canopy		Curbing
	Proposed Features		Dispenser
	Remediation System		UST
	Concrete		Storm Drain
	Riprap		Site Boundary
	Stone Pathway		
	Fence		



Source: Google Earth, 2009

Environmental Alliance, Inc.
 1035 Benfield Blvd., Suite H, Millersville, MD 21108
 Phone: (410) 729-9000 - Fax: (410) 729-9001

Sheetz Store #177 3281 Main Street Manchester, Maryland Remediation System Layout			
DESIGNED BY: CAF	DRAWN BY: SKJ	UPDATED BY: ---	FIGURE NO.:
APPROVED BY: <i>CAF</i>	PROJECT NO.: 2486	DATE: 04/28/2010	II-1

CONTROL VALVE BODIES

- BALL VALVE
- GATE VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- SWING CHECK VALVE
- DIAPHRAGM VALVE
- BALL CHECK VALVE
- NEEDLE VALVE
- 3 WAY VALVE
- 4 WAY VALVE
- FOOT VALVE
- SAMPLE VALVE
- SAMPLE PORT

ACTUATORS/REGULATORS

- GEAR ACTUATOR
- PRESSURE RELIEF
- DIAPHRAGM ACTUATOR
- HYDRAULIC ACTUATOR
- SOLENOID ACTUATOR
- MOTOR ACTUATOR
- DIGITAL ACTUATOR
- WATER ACTUATOR
- REGULATOR
- FLOW INDICATOR
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE

MEASURING DEVICE SYMBOLS:

- SINGLE PORT PITOT TUBE
- AVERAGING PITOT TUBE
- POSITIVE DISPLACEMENT FLOW INDICATOR
- VORTEX SENSOR
- SONIC FLOW METER
- ROTAMETER FLOW INDICATOR
- TARGET TYPE SENSOR
- WEIR
- VENTURI TYPE FLOW ELEMENT
- FLOW NOZZLE
- ORIFICE PLATE FLOW ELEMENT

FITTINGS & PIPING

- VIRTUAL CONNECTOR
- FLANGED CONNECTION
- SCREWED CONNECTION
- UNION
- COUPLING
- RUPTURE DISK
- REDUCER
- STRAINER
- FLOW RESTRICTOR
- FLEX HOSE
- CAM LOCK
- REMOVABLE CLEAR PIPE
- EXPANSION JOINT/SLEEVE
- HOSE CONNECTION
- PNEUMATIC QUICK CONNECT
- PLUG
- PIPE CAP
- SLIP UPDRAFT VENT CAP
- ELBOW - TURNED UP
- ELBOW - TURNED DOWN
- ELBOW - 90°
- ELBOW - 45°
- ELBOW - LONG RADIUS
- REDUCING ELBOW
- TEE REDUCING
- TEE (OUTLET UP)
- TEE (OUTLET DOWN)
- TEE

LINE DESIGNATION:

2 - VR - 01 - PV
SIZE IN INCHES PROCESS LINE NUMBER MATERIAL SPECIFICATION

SYMBOL & LEGEND SHEET EQUIPMENT

- LEVEL SWITCH FLOATS
- BAG FILTER
- LIQUID RING PUMP
- CENTRIFUGAL PUMP
- ROTARY VANE COMPRESSOR
- DISPLACEMENT PUMP
- PRODUCT DRUM
- AIR FILTER
- POSITIVE DISPLACEMENT BLOWER
- BLOWER
- PROPORTIONING PUMP
- CENTRIFUGAL BLOWER PUMP
- HEAT EXCHANGER/CONDENSER
- HEATER
- OIL WATER SEPARATOR
- PACKED COLUMN AIR STRIPPING TOWER
- PISTON COMPRESSOR
- WELL WITH PUMP
- SKIMMER PUMP
- DIAPHRAGM PUMP
- SILENCER
- VAPOR PHASE CARBON VESSEL
- LIQUID PHASE CARBON VESSEL (STEEL)
- MOISTURE SEPARATOR
- LOW PROFILE AIR STRIPPER
- LIQUID RING PUMP HOLDING TANK

INSTRUMENTATION:

INSTRUMENT TYPE → **PI** ← SYSTEM POSITION NUMBER
 SYSTEM DESIGNATION → **VE1** ←

- REFERENCE POINT FOR DESIGN ONLY NOT ACTUAL INSTALLED INSTRUMENT. OPTIONAL FIELD MOUNTED INSTRUMENT TO BE INSTALLED AT THIS LOCATION IF CHOSEN.
- LOCAL MOUNTED INSTRUMENT
- INSTRUMENTS WITH INPUTS OR OUTPUTS AT THE SITE CONTROL PANEL
- PILOT LIGHT OR ALARM INDICATOR

INSTRUMENT TYPE/DESIGNATION:

- PI PRESSURE INDICATOR
- PS PRESSURE SWITCH
- PSH PRESSURE SWITCH HIGH
- PSL PRESSURE SWITCH LOW
- DPS DIFFERENTIAL PRESSURE SWITCH
- DPI DIFFERENTIAL PRESSURE INDICATOR
- PC PRESSURE CONTROL
- PAH PRESSURE ALARM HIGH
- PAL PRESSURE ALARM LOW
- FI FLOW INDICATOR
- FM FLOW METER
- FQI FLOW METER (TOTALIZING)
- FS FLOW SWITCH
- TI TEMPERATURE INDICATOR
- TSH TEMPERATURE SWITCH HIGH
- TSL TEMPERATURE SWITCH LOW
- TT TEMPERATURE TRANSDUCER
- TAH TEMPERATURE ALARM HIGH
- TAL TEMPERATURE ALARM LOW
- LSLL LEVEL SWITCH LOW LOW
- LSL LEVEL SWITCH LOW
- LSM LEVEL SWITCH MIDRANGE
- LSH LEVEL SWITCH HIGH
- LSHH LEVEL SWITCH HIGH HIGH
- LAL LEVEL ALARM LOW
- LAH LEVEL ALARM HIGH
- CP CAPACITIVE SENSOR/PROBE
- S SAMPLE PORT

SYSTEM DESIGNATION:

- ASW AIR SPARGE WELL & MANIFOLD
- VEW VAPOR EXTRACTION WELL & MANIFOLD
- DPW DUAL PHASE WELL & MANIFOLD
- ERW ELECTRIC RECOVERY WELL & PUMP
- PRW PNEUMATIC RECOVERY WELL & PUMP
- VER VAPOR EXTRACTION REGENERATIVE BLOWER
- VEP VAPOR EXTRACTION POSITIVE DISPLACEMENT
- ASV AIR SPARGE ROTARY VANE COMPRESSOR
- ASB AIR SPARGE POSITIVE DISPLACEMENT BLOWER
- DPO DUAL PHASE SEALED LIQUID RING PUMP
- DPL DUAL PHASE LIQUID RING PUMP
- DPB DUAL PHASE POSITIVE DISPLACEMENT BLOWER
- OWS OIL-WATER SEPARATOR SYSTEM
- STL AIR STRIPPER LOW PROFILE
- VGAC VAPOR PHASE GRANULAR ACTIVATED CARBON
- LGAC LIQUID PHASE GRANULAR ACTIVATED CARBON
- ET EQUALIZATION TANK
- BF BAG FILTER

VALVE ABBREVIATIONS

- NC - NORMALLY CLOSED
- NO - NORMALLY OPEN
- MAN - MANUAL

MATERIAL SPECIFICATION:

- PVC - POLYVINYL CHLORIDE
- GM - GALVANIZED
- RC - RIGID COPPER
- IR - IRON
- ABS - ACRYLONITRILE BUTADIENE STYRENE
- FL - FLEX

PROCESS LINE INDICATORS

- FLOW DIRECTION
- MAJOR PROCESS
- MINOR PROCESS
- WATER/AIR PIPING
- AIR PIPING
- INSTRUMENTATION CONTROLS
- PNEUMATIC LINE
- CONNECTING LINE
- CROSSOVER LINE

PROCESS LINE ABBREVIATIONS

- ES - ELECTRIC SUPPLY
- GS - GAS SUPPLY
- HS - HYDRAULIC SUPPLY
- NS - NITROGEN SUPPLY
- SS - STEAM SUPPLY
- W - WATER SUPPLY
- V - VACUUM
- VR - VAPOR REMOVAL
- TF - TOTAL FLUIDS
- AP - ACCESS PIPE / CONDUIT
- SA - SPARGE AIR
- PN - PNEUMATIC SUPPLY

Source: P&ID legend obtained from GES

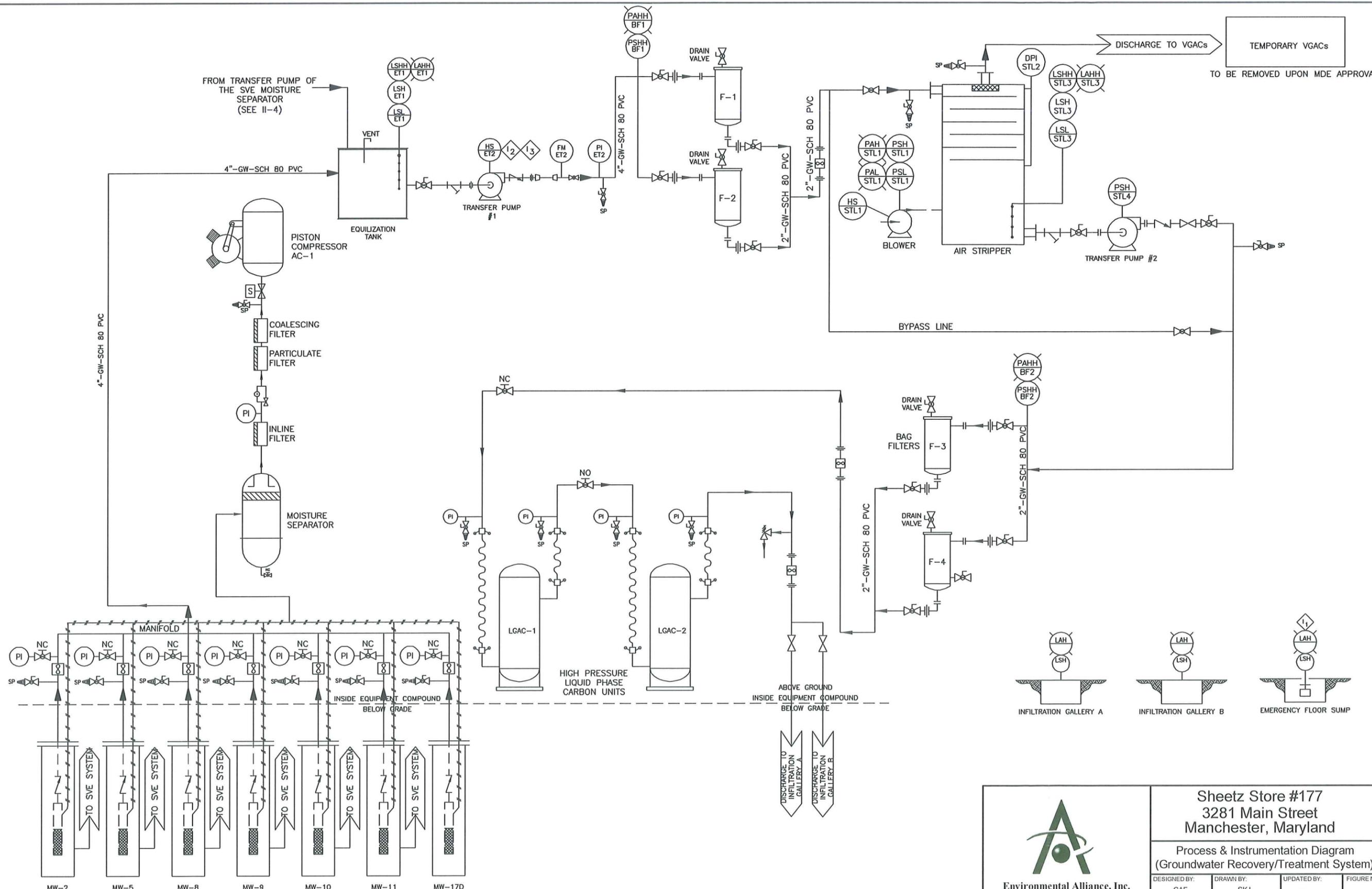


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Sheetz Store #177
 3281 Main Street
 Manchester, Maryland

Process & Instrumentation Diagram Legend

DESIGNED BY: CAF	DRAWN BY: SKJ	UPDATED BY: ---	FIGURE NO. 11-2
APPROVED BY: <i>[Signature]</i>	PROJECT NO. 2486	DATE: 4/28/2010	

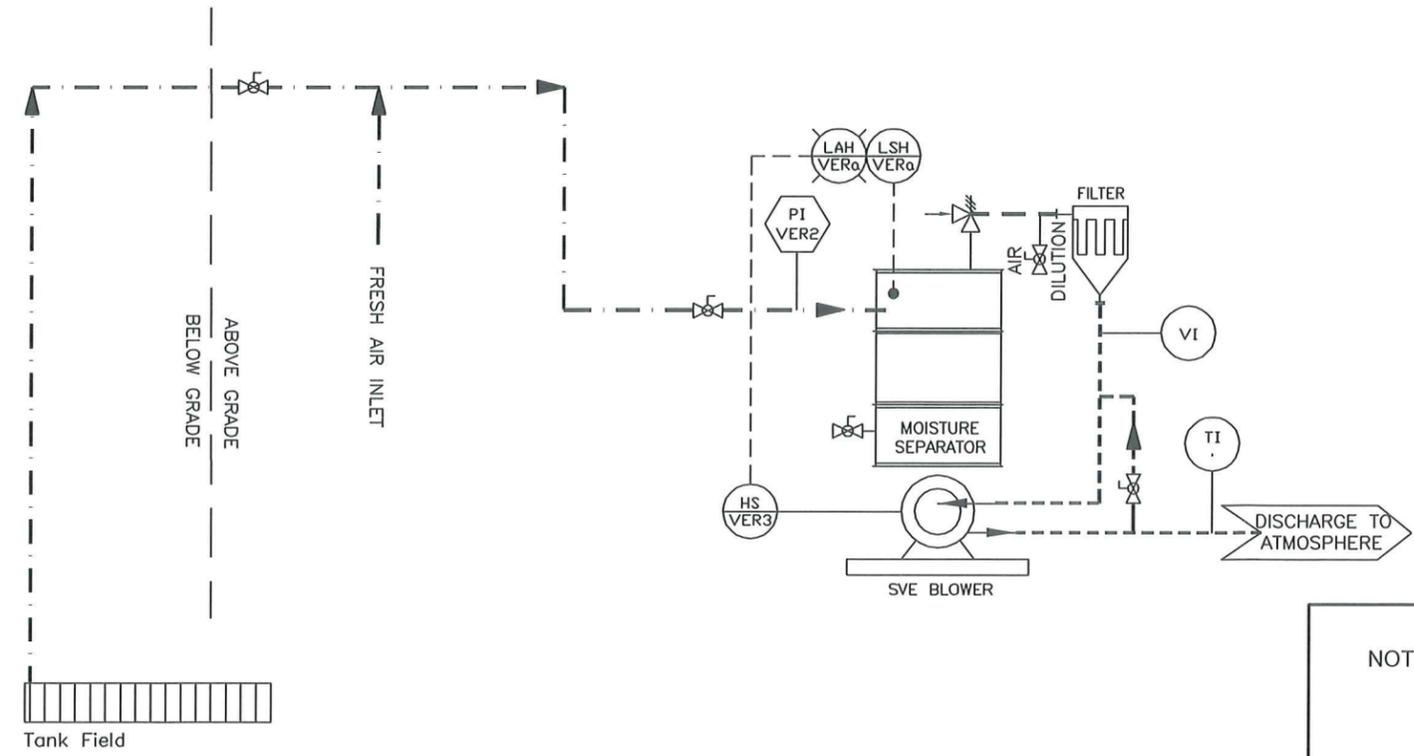
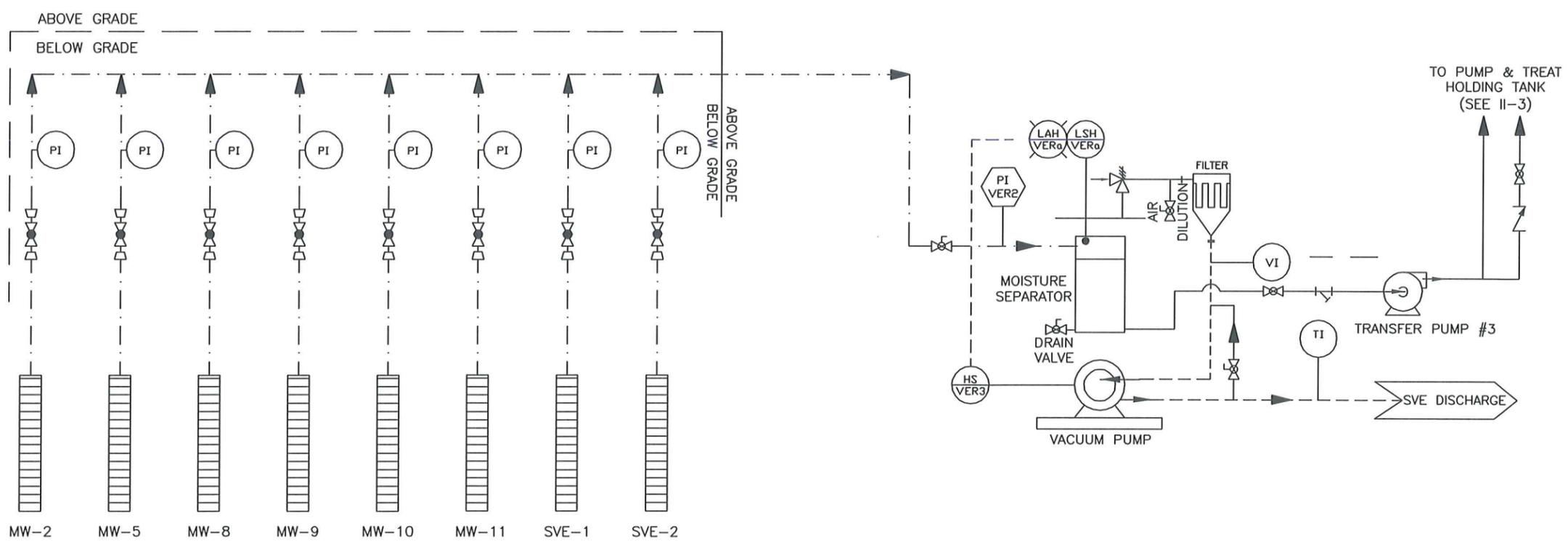


DISCHARGE TO VGACs
 TEMPORARY VGACs
 TO BE REMOVED UPON MDE APPROVAL



NOT TO SCALE

 Environmental Alliance, Inc. 1035 Benfield Blvd., Suite H, Millersville, MD 21108 Phone: (410) 729-9000 - Fax: (410) 729-9001	Sheetz Store #177 3281 Main Street Manchester, Maryland		FIGURE NO. II-3
	Process & Instrumentation Diagram (Groundwater Recovery/Treatment System)		
	DESIGNED BY: CAF	DRAWN BY: SKJ	
APPROVED BY: 	PROJECT NO: 2486	DATE: 4/28/2010	



NOT TO SCALE



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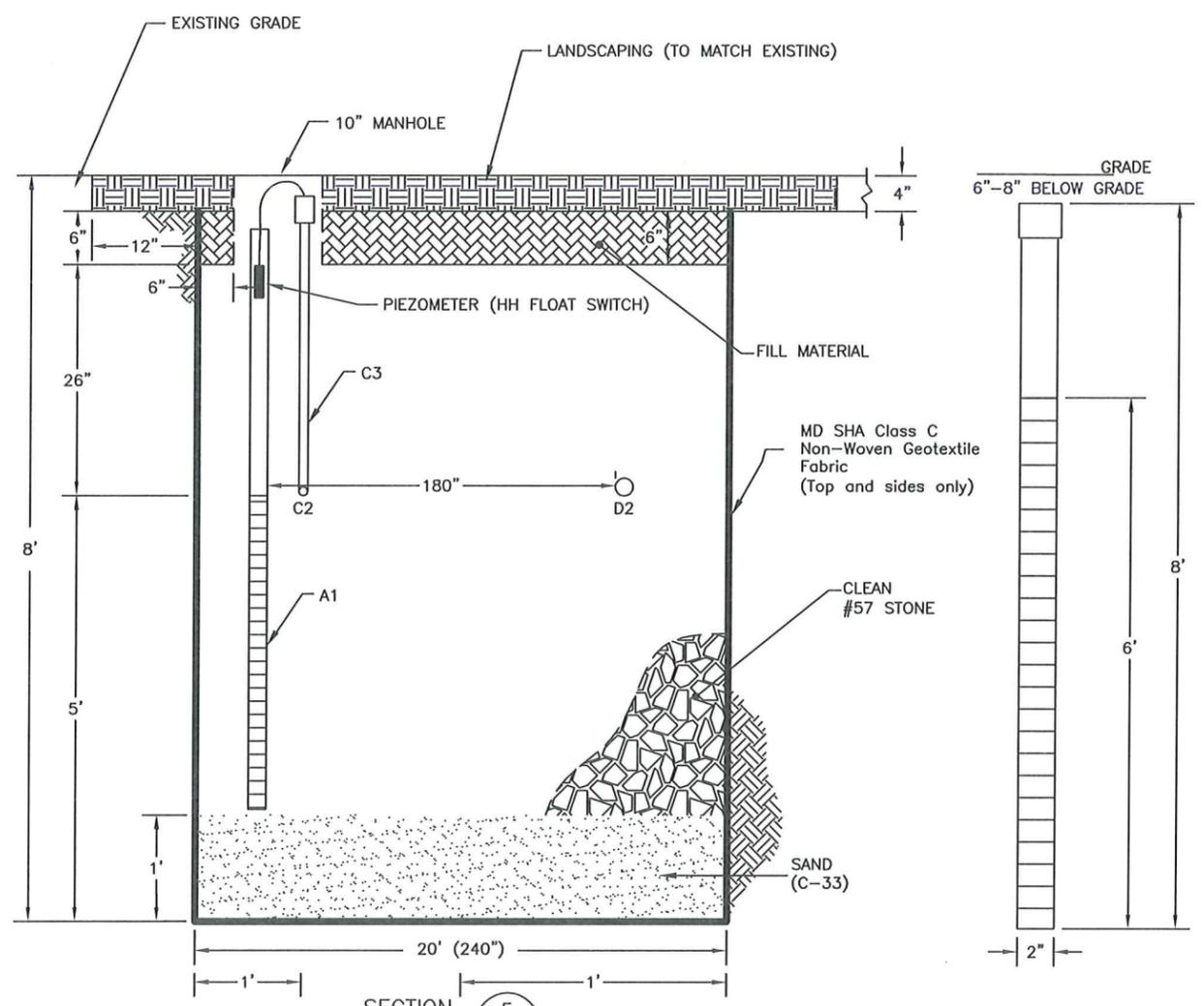
Sheetz Store #177
 3281 Main Street
 Manchester, Maryland

Process & Instrumentation Diagram
 (SVE Treatment System)

DESIGNED BY: CAF	DRAWN BY: SKJ	UPDATED BY: ---	FIGURE NO
APPROVED BY: <i>[Signature]</i>	PROJECT NO: 2486	DATE: 4/28/2010	II-4

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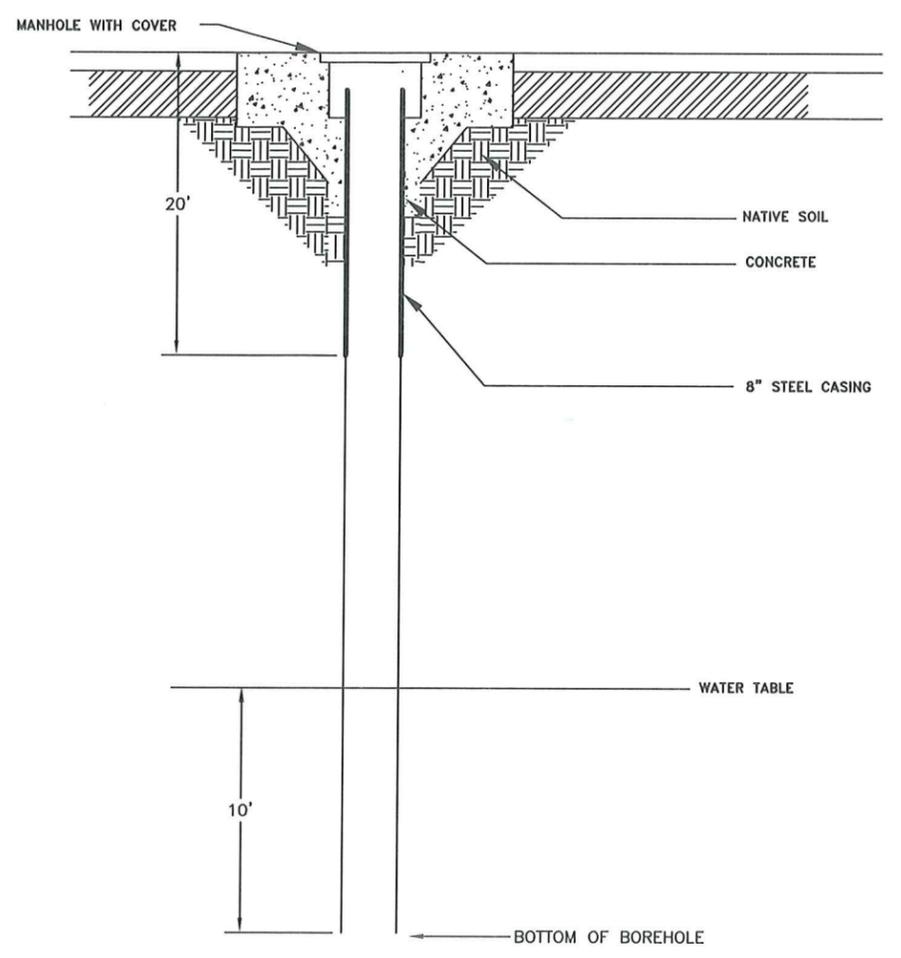
SECTION E
2 | 5
TYPICAL CHARACTERISTIC OF INFILTRATION GALLERY

Number of Points - Three
Well Construction - Schedule 40 PVC
Well Head - 10" Manhole

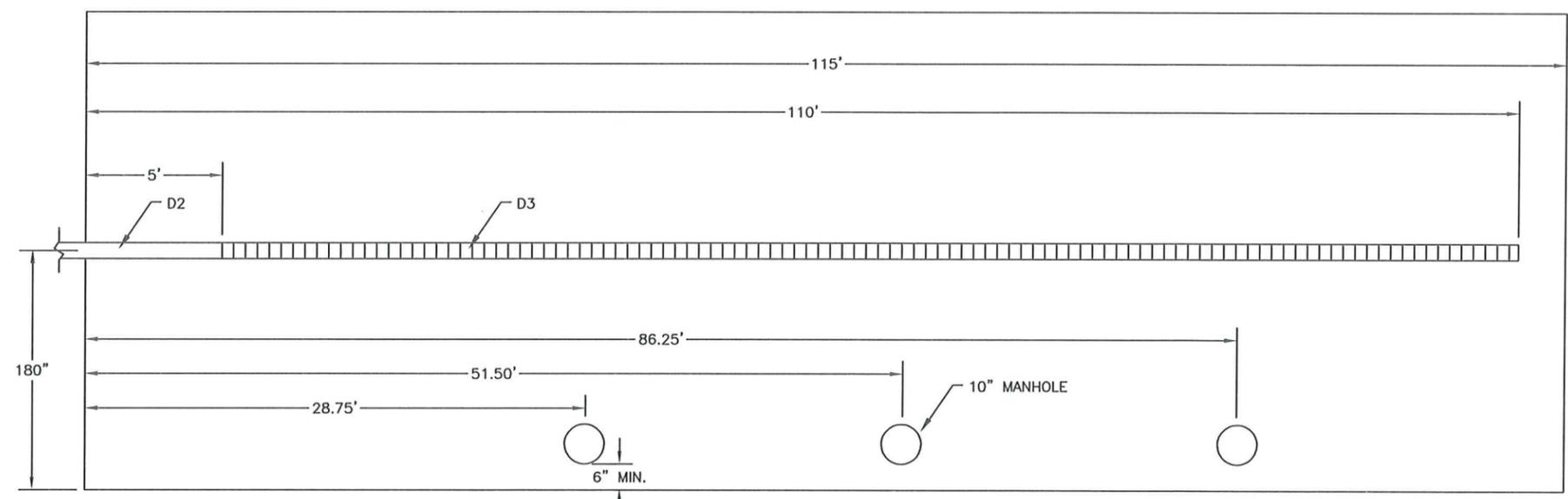
PIPE	DESCRIPTION
A1	2" SCH 40 PVC well, 3' of solid pipe, 5' of screen.
C2	1" Carlon Conduit from system to infiltration gallery.
C3	1" Carlon Conduit from C2 in the infiltration gallery to the well head electrical box.
D2	2" SCH 40 PVC discharge line from system to infiltration gallery.
D3	2" SCH 40 screened PVC within either infiltration gallery.

- NOTES:
- ONLY ONE PIEZOMETER IN EACH GALLERY WILL CONTAIN A HIGH-HIGH FLOAT SWITCH
 - NOT TO SCALE

PIEZOMETER CONSTRUCTION DETAILS



TOTAL DEPTH = 10' INTO SEASONAL GROUNDWATER TABLE
CASING INTERVAL = 0 - 20'
OPEN BOREHOLE = 20' TO TD
NUMBER OF POINTS = THREE
WELL HEAD - 12" MANHOLE
WELL DIAMETER = 8" OPEN BOREHOLE



TYPICAL INFILTRATION GALLERY CROSS SECTION

 Environmental Alliance, Inc. 1035 Benfield Blvd., Suite H, Millersville, MD 21108 Phone: (410) 729-9000 - Fax: (410) 729-9001	Sheetz Store #177 2381 Main Street Manchester, Maryland			DESIGNED BY: CAF DRAWN BY: SKJ UPDATED BY: -- APPROVED BY: [Signature] PROJECT NO. 2486 DATE: 9/3/2010	FIGURE NO: II-5
	Infiltration Gallery Cross Section and Monitoring Point Details				