EnviroSureInc
Quality. Integrity. Reliability.

1 North Bacton Hill Road
Suite 208
Malvern, PA 19355
Phone 610•696•8980
www.envirosureinc.com

December 20, 2024 *No. SO2638*

Ms. Lindley Cambell, Case Manager, Remediation Division, Oil Control Program
Maryland Department of the Environment's Oil Control Program
1800 Washington Boulevard
Baltimore, Maryland 21230

RE: RESPONSE TO SYSTEM EVALUATION AND REPORTING REQUIREMENTS
Case No. 1992-2616-CE
Notice of Violation NV-2004-038-Addendum
Calvert Citgo (Former Alger Country Store)
2815 North East Road, North East
Cecil County, Maryland
Facility I.D. No. 5678

Dear Ms. Campbell,

EnviroSure, Inc. (EnviroSure) was retained in late 2023 to continue to direct the Calvert Citgo located at 2815 North East Road, North East, Cecil County, Maryland (the Site) through the Maryland Department of the Environment (MDE) Oil Control Program (OCP) on behalf of Calvert Country Store, LC (the Client) and Alger Oil, Inc.

In a letter dated October 24, 2024, the MDE OCP recently completed a review of the case file for the above-referenced commercial property (the "Site"). The MDE OCP requested an investigation be conducted of the current dual phase extraction (DPE) system and a comprehensive report be submitted to the MDE OCP by December 23, 2024, that includes the results of the investigation and plans for improving the DPE system effectiveness, modifications, etc., or a Corrective Action Plan Addendum (CAPA) proposing alternative remedial technologies. The MDE OCP also requested a technical meeting to include all parties to take place in January 2025.

EnviroSure Inc. ("EnviroSure") retained Remediation Equipment and Services, Inc. ("RES") of Royesford, Pennsylvania, to assist in the DPE system investigation as RES provided the existing DPE system at the Site. The following are the results of our investigation of the existing DPE system at the Site.

Background

RES provided the existing DPE system to React Environmental Professional Services Group, Inc. (REPSG) of Philadelphia, Pennsylvania, for the Site to use as a short-term (1 to 2-year) pilot test system on April 24, 2017, with one groundwater monitoring well connected. RES and RESPG conducted a standard weeklong pilot test to determine the type of equipment for long-term operations in 2013. MDE approved the DPE system with one groundwater monitoring well. The system was originally a rental; however, as the length of time of the rental increased, it became financially beneficial for the responsible parties to purchase the DPE system. The DPE system was used previously on other sites and had been refurbished before installation. The DPE system currently consists of a network of monitoring wells that have been converted to extraction wells (MW-001R, MW-003, and MW-005) piped to the central remediation system. The DPE system utilizes vapor and groundwater extraction to mass remove petroleum-related regulated compounds in the unsaturated zone from the subsurface.

Status of the DPE System

Mr. Robert Lloyd, P.G., Hydrogeologist with EnviroSure, Mr. Joshua Ostrow, Staff Geologist with EnviroSure, and Mr. Gary Sheridan of RES visited the Site on November 14, 2024, to evaluate the Site and the current DPE System. The DPE system operated upon arrival and departure.

The group met with the Site owner, Mr. Prag Patel, and advised him of the intent of the site visit. A walkaround of the DPE system was completed, along with a walkout along the remediation trenching to the three (3) active recovery wells (MW-001R, MW-003, and MW-005) and the endpoint well box. The DPE system discharge pipe runs to the swale along North East Road.

The DPE system currently shows over 55,000 hours of run time. There have been multiple major component replacements in the system, including Liquid Ring Pump (LRP) Motor(s), Moisture Separator Tank, Moisture Separator Transfer pump components, PLC, HMI Screen, and Liquid Carbon vessels. The number of hours shown is indicative of a need for a significant pump service in the near future in order to maintain the vacuum. Currently, the vacuum was at about 17-18 inHg. It should be operating at 20+ inHg. The oil level was good; however, it was cloudy, which indicates it is time for servicing. The Reservoir gauge is in the yellow and getting close to red, indicating a need for service.

One of the Liquid Granular Activated Carbon (LGAC) vessels was damaged by freezing in the past winter, is beyond repair, and needs to be replaced. The Vapor Phase Granular Activated Carbon (VGAC) should be checked for concentrations and possibly due for an exchange.

The DPE system controls are a programmable logic controller (PLC)-based and capable of being upgraded to allow for remote telemetry; however, that was never added as the system was put in to be a pilot system, and it was deemed not to be a cost that should be added—instead, a Remote Cellular Alarm (CM-18) which sends a daily report and system shutdown reports. The data logging portion of this system is unknown at this time without further evaluation and should be upgraded if the system is deemed to remain.

The system piping on the LRP is all leaking, and the oil seals appear to have worn. They are showing signs of possible future failure. The influent manifold piping has been modified multiple times to keep the system operational and is showing signs of wear. Gauges on the piping are either clouded, inoperable, or just out of life.

For the system to remain operational, it will require a major overhaul, including pump rebuild, PLC/HMI (human-machine interface)/Telemetry upgrades, LGAC replacement, VGAC changeout, additional winterization additions for the water lines, and site work for the remediation well boxes, including vault resetting and connection to additional wells.

Recommendations

DPE system remedies often operate for long periods, as in this case, which has significantly contributed to the use of energy and environmental footprint resources to operate the Pump and Treat remedy. This type of pump and treat system is highly effective in remediating highly contaminated waters within an understood radius of vacuum influence in a relatively short time. However, once this high contamination is removed, alternate technologies that are more effective at low contaminant concentrations should be evaluated. As stated in EnviroSure's quarterly monitoring reports, it is our opinion that the DPE system has not been effective over the last seven (7) years since connecting two (2) additional groundwater monitoring wells at reducing concentrations of constituents of concern (COCs) and reducing the size of the groundwater plume.

EnviroSure proposes to develop a Corrective Action Plan Addendum (CAPA) to submit to the MDE proposing alternative remedial technologies. EnviroSure has begun evaluating the following three (3) alternative remedial options for the Site to discuss further with MDE during their requested technical meeting (including all parties) in January 2025.

Ozone Injection System - An ozone injection system could be pilot-tested using the existing wells to determine the radius of influence effectiveness and the operating cost for the Site based on current conditions/plume concentrations.

A major consideration for this technology is that it is a "Green" technology and generates no waste from the site. RES would anticipate, based upon their experience installing and operating these systems, the need for a 6-8 pound per day system in an enclosed trailer consisting of a Rotary Screw Air Compressor, Oxygen Concentrator, and Ozone Generator. A discharge manifold with 8 to 10 points would be in the trailer.

Ozone is made from the air, and oxygen is sent through the electrical process of the Ozone generator and sent to each well at a low rate of usually 10 to 15 Liters per minute with the minimum air pressure to achieve a breakthrough in the well.

RES has a used system in stock that could be used for the pilot test at the Site. The Radius of Influence and systematic readings would be recorded to evaluate the system's effectiveness.

If the results of the Pilot test are good, this system can be implemented. Some additional work would be required to modify the existing piping to install sweeps in place of pressure 90's elbows, and the additional wells would still need work.

Chemical Injections by Regenesis - EnviroSure has provided Regenesis with the Site data and iso-concentration contour maps of the Site groundwater constituents of concern (attached). Regenesis's proposed treatment is in situ injections of their RegenOx and Oxygen Release Compound (ORC) Advanced chemical products in the vicinity between the existing tank field and well MW-001R. RegenOx is an in situ chemical oxidizer that promotes rapid oxidation of VOCs, and ORC Advanced is a calcium peroxide-based material that releases oxygen into groundwater over an extended period of time, speeding up the natural degradation of VOCs. Both chemical injection materials are targeted at treating gasoline constituents in groundwater,

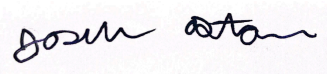
including benzene, methyl tert butyl ether (MTBE), and 1,2-dichloroethane (1,2-DCA), which are COC on-site.

Stabilized Hydrogen Peroxide Injections by Redox Tech - EnviroSure has provided Redox Tech with the Site data and iso-concentration contour maps of the Site groundwater constituents of concern (attached). Redox Tech's proposed treatment is Stabilized Hydrogen Peroxide Injections in order to speed up the oxidization of VOCs over an extended period of time. Redox Tech's proposed treatment will target two locations: "Onsite" at MW-001R and MW-005 on the west side of North East Road and "Offsite" at MW-010 on the east side of North East Road.

At this time, we have yet to receive Regenesis's or ReDox Tech's final assessments, recommendations, or approximate costs for implementation for the responsible parties to review and evaluate. We plan to have this information by the middle of January 2025 to discuss during the January 2025 requested MDE OCP technical meeting. Please let us know if the MDE OCP has any comments regarding the evaluation of the above three (3) alternative remedial options for the Site and tentative dates and times in late January 2025 to set up the technical meeting.

Should you have questions regarding this letter, please contact me at 610.696.8980 or via email at bbeegle@envirosureinc.com.

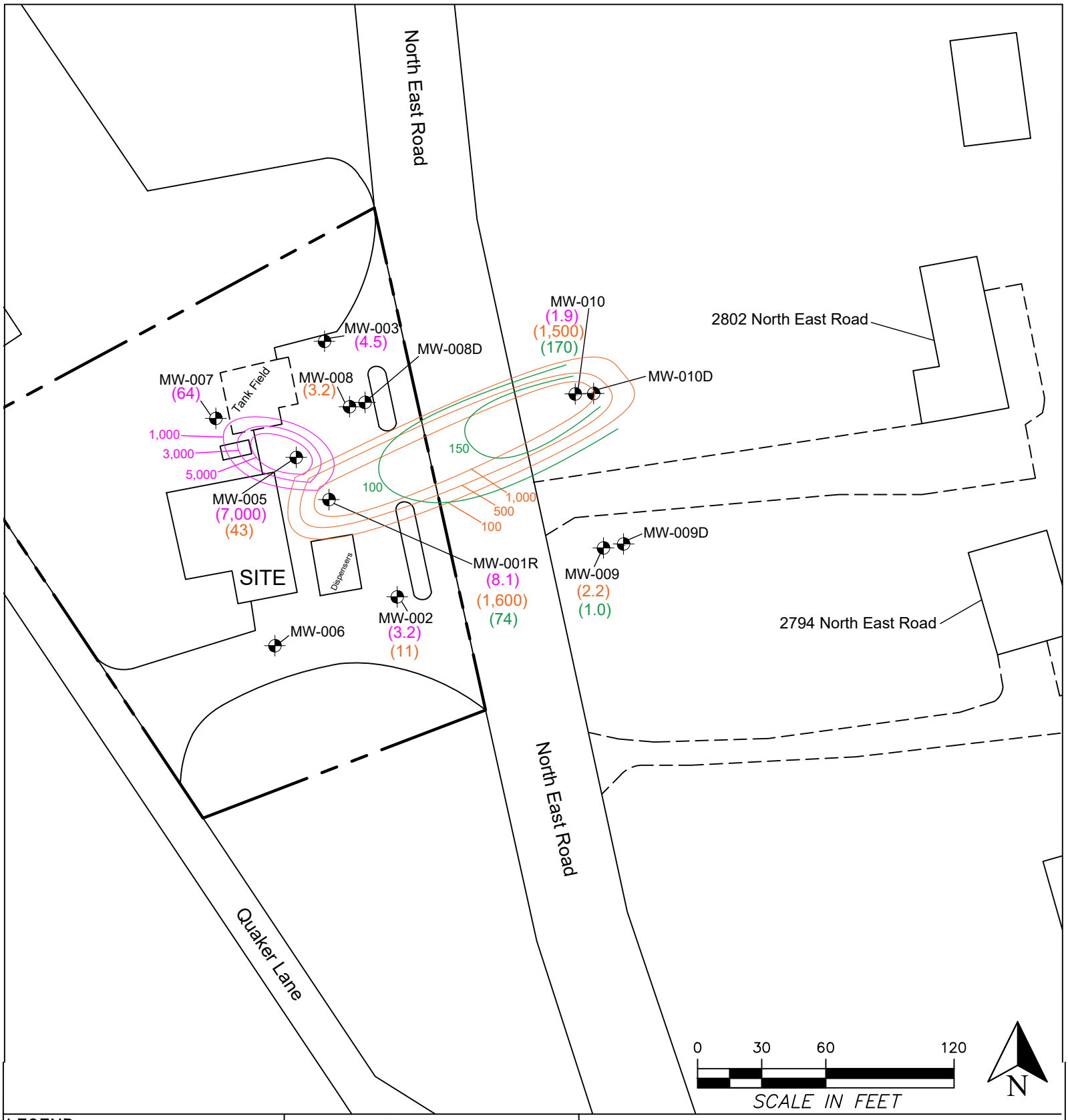
Sincerely,
ENVIROSURE, INC.



Joshua Ostrow
Staff Geologist

Bernard B. Beegle CPG
Senior Project Geologist

Cc: Ms.Ellen Jackson, Eastern Region Supervisor, MDE OCP
Mr. Mr. Pragnesh Patel (Current Owner/Operator)
Mr. Victor Jackson - Representing Current Owner/Operator
Mr. Chris Haab Country Stores - Owner of Alger Oil
Mr. Thomas V. McCarron - Representing Alger Oil



LEGEND:

MDE GW Cleanup-Up Standards:
Benzene: 5 ug/l
Methyl tert-butyl ether: 20 ug/l
1,2-Dichloroethane: 5 ug/l

Concentration Contour:
Benzene
Methyl tert-butyle ether
1,2-Dichloroethane

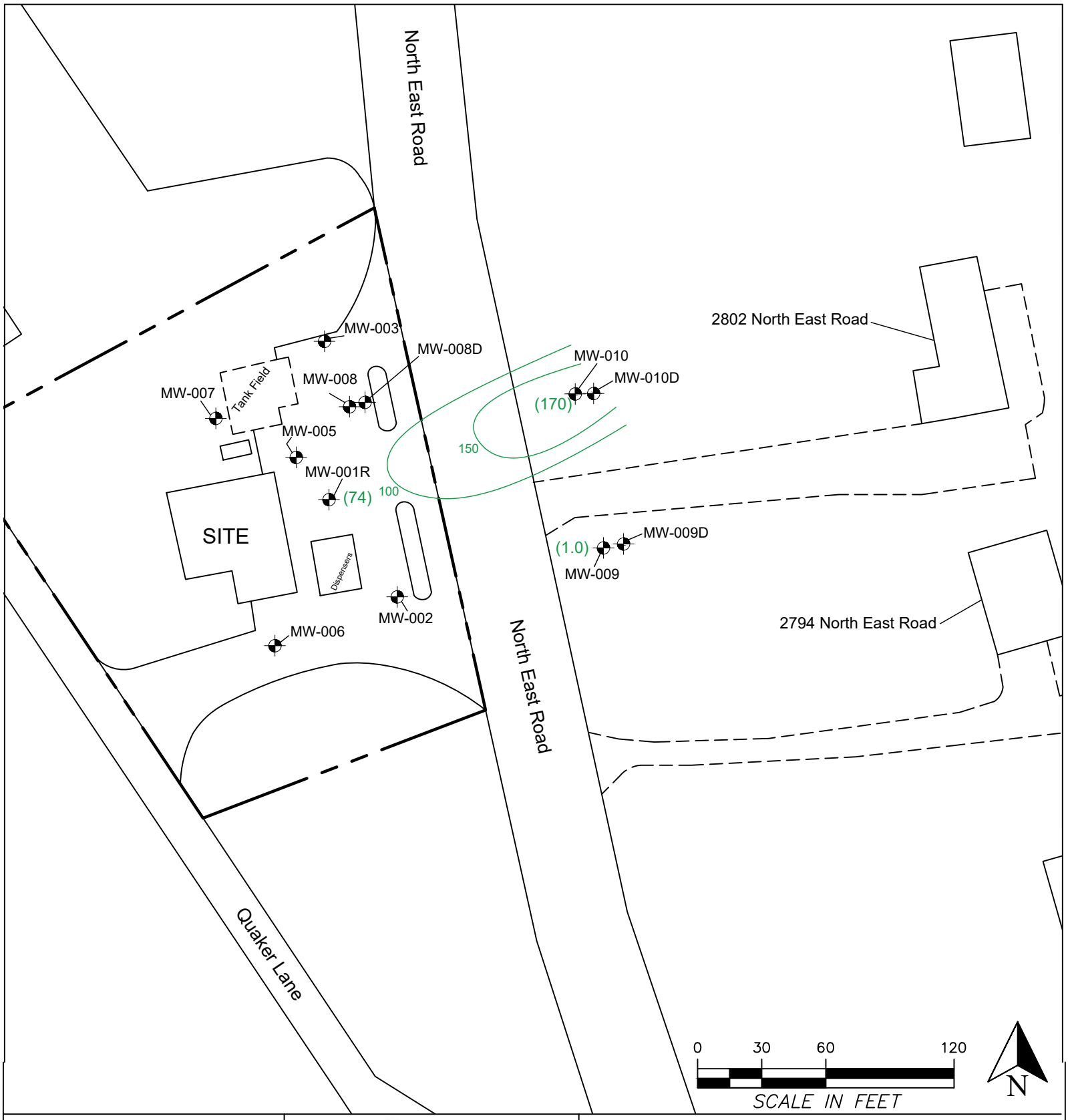
Lab Result:

Benzene	(0.0)
Methyl tert-butyle ether	(0.0)
1,2-Dichloroethane	(0.0)

EnviroSure Inc
Quality. Integrity. Reliability.
1 North Bacton Hill Road, Suite 208
Malvern, PA 19355

FIGURE X
ISOCONCENTRATION MAP-SHALLOW WELLS
SEPTEMBER 25, 2024
2815 NORTH EAST ROAD
NORTH EAST
CECIL COUNTY, MARYLAND

APPROVED BY	B.BEEGLE				
DRAWN BY	K.ECKLEY				
PROJECT NO.	S02638	SCALE	GRAPHIC	DATE	12/3/2024	DRAWING NO.	S02638



LEGEND:

1,2-Dichloroethane
MDE GW Clean-Up Stadard: 5 ug/l

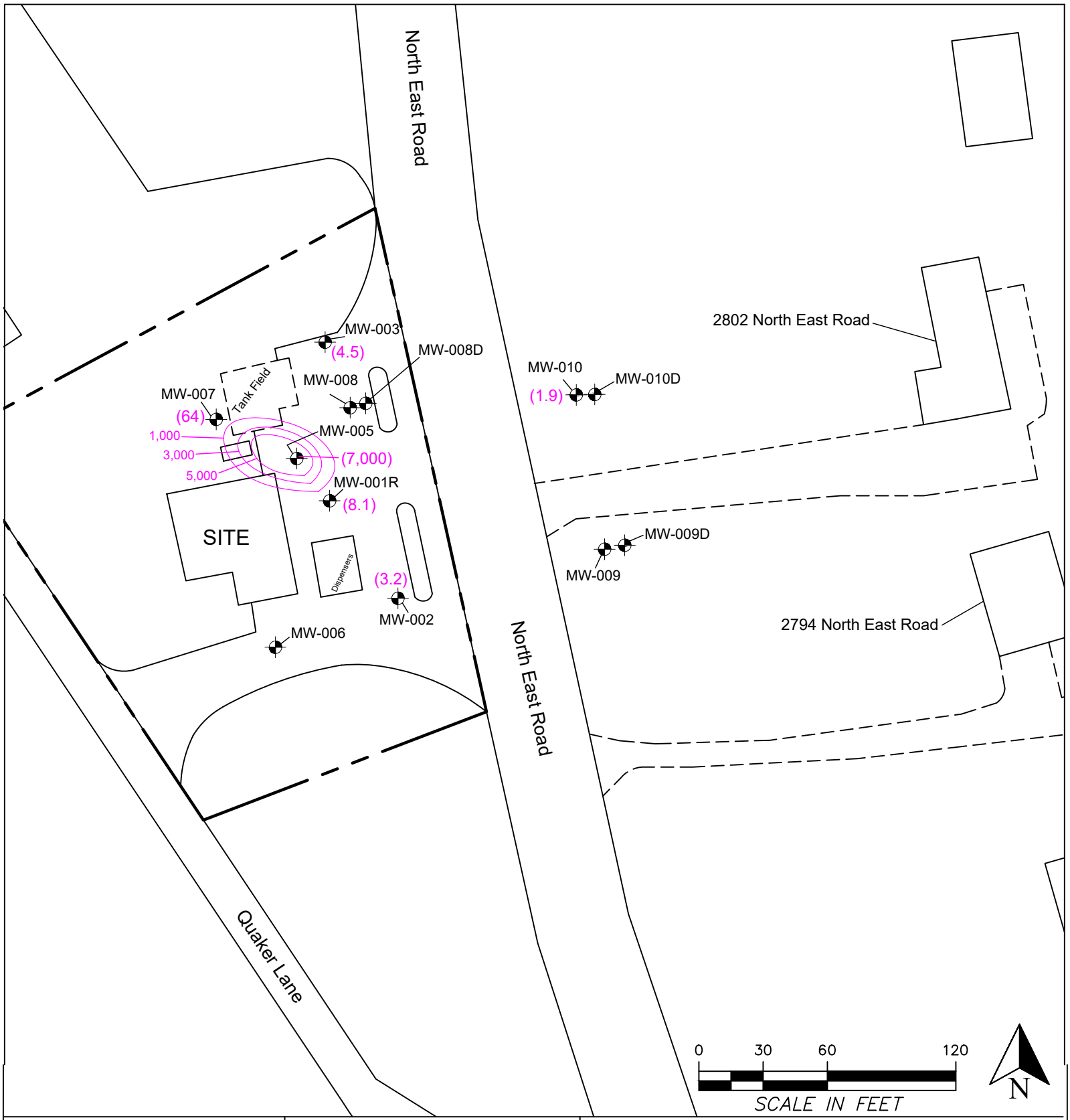
Concentration Contour
1,2-Dichloroethane Lab Result (0.0)

EnviroSure Inc
Quality. Integrity. Reliability.
1 North Bacton Hill Road, Suite 208
Malvern, PA 19355

FIGURE X
ISOCONCENTRATION MAP - 1,2-DICHLOROETHANE
SEPTEMBER 25, 2024
2815 NORTH EAST ROAD
NORTH EAST
CECIL COUNTY, MARYLAND

APPROVED BY	B.BEEGLE
DRAWN BY	K.ECKLEY

PROJECT NO.	SCALE	DATE	DRAWING NO.
SO2638	GRAPHIC	12/3/2024	SO2638



LEGEND:

Benzene

MDE GW Clean-Up Stadard: 5 ug/l

Concentration Contour

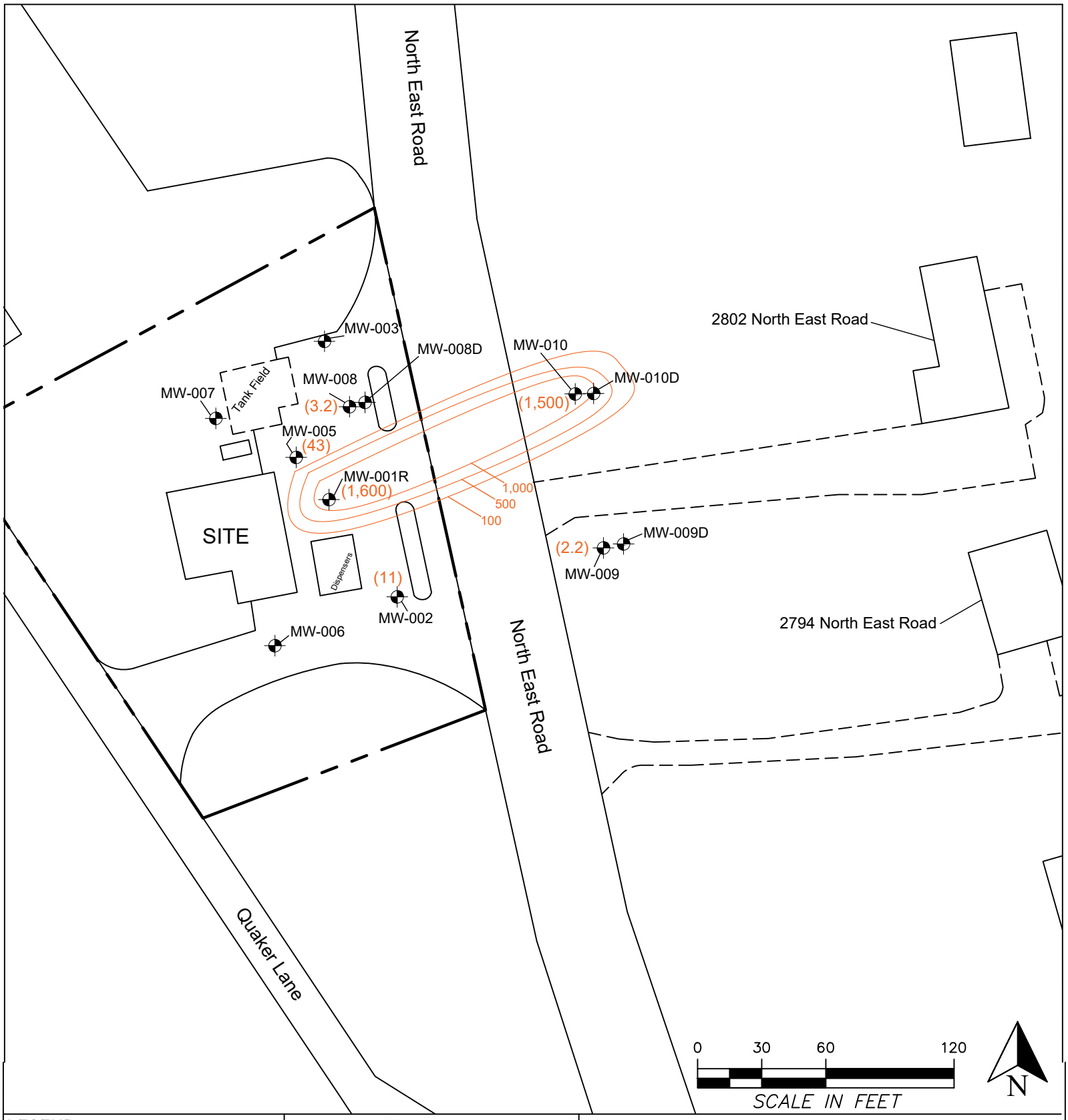
Benzene Lab Result (0.0)

EnviroSure Inc
Quality. Integrity. Reliability.
1 North Bacton Hill Road, Suite 208
Malvern, PA 19355

FIGURE X

ISOCONCENTRATION MAP - BENZENE
SEPTEMBER 25, 2024
2815 NORTH EAST ROAD
NORTH EAST
CECIL COUNTY, MARYLAND

APPROVED BY: B.BEEGLE			
DRAWN BY: K.ECKLEY			
PROJECT NO.: SO2638	SCALE: GRAPHIC	DATE: 12/3/2024	DRAWING NO.: SO2638



LEGEND:

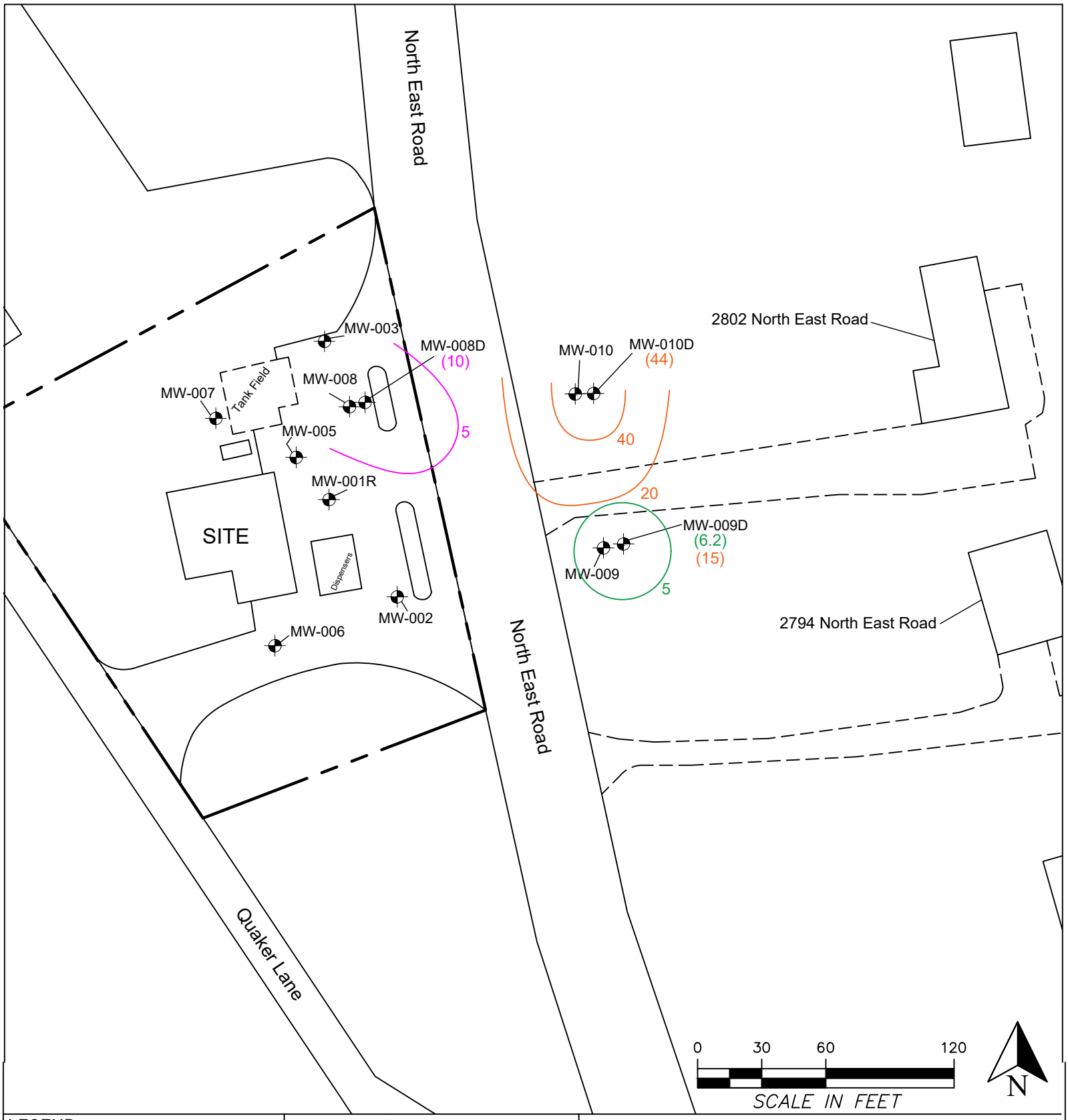
Methyl tert-butyl ether (MTBE)
MDE GW Clean-Up Stadard: 20 ug/l

Concentration Contour
MTBE Lab Result (0.0)

EnviroSure Inc
Quality. Integrity. Reliability.
1 North Bacton Hill Road, Suite 208
Malvern, PA 19355

FIGURE X
ISOCONCENTRATION MAP - MTBE
SEPTEMBER 25, 2024
2815 NORTH EAST ROAD
NORTH EAST
CECIL COUNTY, MARYLAND

APPROVED BY	B.BEEGLE
DRAWN BY	K.ECKLEY
PROJECT NO.	SO2638
SCALE	GRAPHIC
DATE	12/3/2024
DRAWING NO.	SO2638



LEGEND:

MDE GW Cleanup-UpStandards:
Benzene: 5 ug/l
Methyl tert-butyl ether: 20 ug/l
1,2-Dichloroethane: 5 ug/l

Concentration Contour:
Benzene
Methyl tert-butyle ether
1,2-Dichloroethane

Lab Result:
Benzene (0.0)
Methyl tert-butyle ether (0.0)
1,2-Dichloroethane (0.0)

EnviroSure Inc
Quality. Integrity. Reliability.
1 North Bacton Hill Road, Suite 208
Malvern, PA 19355

FIGURE X

ISOCONCENTRATION MAP - DEEP WELLS
SEPTEMBER 25, 2024
2815 NORTH EAST ROAD
NORTH EAST
CECIL COUNTY, MARYLAND

APPROVED BY	B.BEEGLE
DRAWN BY	K.ECKLEY
PROJECT NO.	SO2638
SCALE	GRAPHIC
DATE	12/3/2024
DRAWING NO.	SO2638