Pennsylvania
Department of Environmental Protection

September 25, 2025

James Kerrigan
Gatz Auto, Inc.
2899 Holme Ave
Philadelphia, PA 19152

Via e-mail at: kerriganautomotive@comcast.net

Re: Site Characterization Report & Remedial Action Plan Approval
Storage Tank System Release: August 7, 2023
Storage Facility ID No. 51-30277
Incident No. 59172
Gatz Auto
2899 Holme Ave
City of Philadelphia

Dear Mr. Kerrigan:

The Department of Environmental Protection (DEP) has reviewed the documents titled Site Characterization Report Under the Statewide Health Standard, dated June 13, 2025, and Remedial Action Plan, dated July 28, 2025, for the release referenced above. The documents were prepared by Synergy Environmental, Inc. and submitted as a Site Characterization Report (SCR) and Remedial Action Plan (RAP) as required by 25 Pa. Code Sections 245.310 and 245.311, respectively. You selected the nonresidential Statewide health standard as the remediation standard for soil and groundwater.

DEP approves the SCR and RAP in accordance with 25 Pa. Code Section 245.311(b)(1).

25 Pa. Code Section 245.312(a) specifies that remedial action shall be implemented upon approval of the RAP according to the schedule contained in the RAP. Remedial action should, therefore, commence immediately upon receipt of this letter and proceed in accordance with the schedule in the RAP until the selected remediation standard is attained.

Remedial Action Progress Reports (RAPRs) must be submitted to DEP in accordance with Section 245.312(b-d) by the 30th day of the month following the end of each quarter (April 30, July 30, October 30, and January 30). The final RAPR is submitted as part of the Remedial Action Completion Report (RACR). Your first RAPR should be submitted no later than January 30, 2026.

Please submit the RAPRs and RACR electronically through DEP's **public upload form** accessed at: https://greenport.pa.gov/ePermitPublicAccess/PublicSubmission/Home. When uploading these documents, please select "ENV CLEANUP & BROWNFIELDS ECB" as the **Filter Submission Types by Program**; select "STORAGE TANK REMEDIAL ACTION PROGRESS REPORT" or "STORAGE TANK REMEDIAL ACTION COMPLETION

REPORT" for the **Submission Type**, as appropriate; enter the **Permit** #51-30277; and enter the **Project Address** information.

Failure to implement remedial action or submit complete progress reports in accordance with the schedule outlined above may result in enforcement action by DEP. If you wish to modify any part of this RAP or select a new remediation standard, you must prepare and submit a new or modified RAP to DEP in accordance with 25 Pa. Code Section 245.312(e).

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800.654.5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at www.ehb.pa.gov or by contacting the Secretary to the Board at 717.787.3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717.787.3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

If you have any questions, please contact Leanne Hillegas by email at lhillegas@pa.gov or by telephone at 484.250.5747.

Sincerely,

C. David Brown, P.G. Digitally signed by C. David Brown, P.G.
Date: 2025.09.25 15:01:27 -04'00'

C. David Brown, P.G.
Regional Manager
Environmental Cleanup and Brownfields

cc: City of Philadelphia Department of Public Health
Philadelphia L&I
USTIF
ICF, Inc.
Ryan Houck, Synergy Environmental, Inc.
Mr. Staron, P.G.
Ms. Hillegas
Ms. Henderson
OnBase: Storage Tanks/907/Correspondence/Decision Letters

Remedial Action Plan

Gatz Auto
2899 Holme Avenue, Philadelphia
Philadelphia County, Pennsylvania
Facility ID # 51-30277

PREPARED FOR:

Gatz Automotive, Inc.
2899 Holme Ave.
Philadelphia, PA

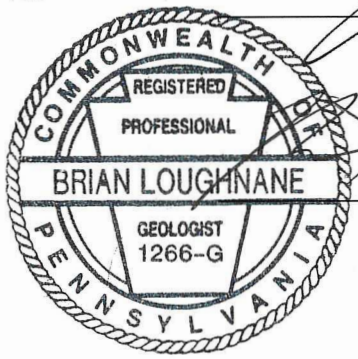
SUBMITTED TO:

PADEP – Southeast Regional Office
Environmental Cleanup and Brownfields
2 East Main Street
Norristown, PA 19401

PREPARED BY:

Ryan Houck
Project Manager

REVIEWED BY:



Brian K. Loughnane, P.G.
Director of Geosciences

Synergy Project No. 24-01483
July 2025

Synergy Environmental Inc.
Environmental Consultants

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1.0 Summary

This *Remedial Action Plan* (RAP) is submitted to the Pennsylvania Department of Environmental Protection (PADEP) in accordance with 25 PA Code Chapter 245 (Administration of the Storage Tank and Spill Prevention Program). The Site is located at 2899 Holme Avenue in Philadelphia, Philadelphia County, Pennsylvania. The objective of the remedial action plan is to select an effective remedial technology suitable for the reduction of dissolved phase compounds associated with unleaded gasoline.

On August 7, 2023, a static test of UST 003 was conducted in response to a Veeder Root leak alarm and PADEP was verbally notified of a release on August 15, 2023. Three USTs onsite were removed and a release was confirmed when a circumferential crack was identified in UST 003 on January 27, 2024. Impacted soils were identified beneath the cracked tank with petroleum parameters above the Non-Residential Statewide Health Standard (NRSHS). A written Notification of Reportable Release (NORR) was submitted to PADEP on January 27, 2024 regarding this release. The NORR is attached as **Appendix A**.

According to 25 PA Code § 250.1, a "Site" is defined as "the extent of contamination originating within the property boundaries and all areas in close proximity to the contamination necessary for the implementation of remediation activities to be conducted under the act". Throughout this report, the term "Site" will be used strictly under this definition. Unless otherwise specified, all soil and groundwater analytical results are compared to Non-Residential Statewide Health Standards (NRSHS) as presented in 25 PA Code Chapter 250, Appendix A.

2.0 Site Description

2.1 General

The Site consists of an approximately 0.41-acre parcel located at 2899 Holme Ave., Philadelphia, Philadelphia County, Pennsylvania. The Site is currently used as an automotive repair shop. A Detailed Site Map is included as **Figure 1**.

The Site operates as an active auto repair shop. Relevant features at the Site include the automotive repair garage and remaining canopy over the removed fuel dispensers. The UST system has been completely removed in January 2024 and no UST components remain at the Site.

2.2 Geographic Setting

According to the United States Geological Survey (USGS) 7.5-minute map (Frankford, Pennsylvania quadrangle), the Site is situated at an approximate elevation of 113 feet above mean sea level (msl). Site topography is generally flat, but appears to slope gently to the west. The nearest surface water body is Pennypack Creek, located approximately 2,050 feet west of the Site and discharges into the Delaware River, located approximately 2.25 miles south of the Site. **Figure 2** provides a topographic map of the area.

Based on information from the ongoing groundwater investigation at the Site, groundwater underlying the Site is expected to flow, under static conditions, towards the west. Based on site characterization activities performed at the Site, the unconsolidated deposits beneath the Site are composed primarily of feldspathic sands. The Site appears to be underlain with gray schist. Depth to water during the groundwater investigations has been measured between from approximately 36 feet below ground surface (bgs) and 40 feet bgs. **Figure 3** provides a geologic map of the area.

2.3 Background Site Environmental History

The following sub-sections describe historical environmental activities performed at the Site.

2.3.1 UST Removal Activities

The UST system at the Site at the time of the release consisted of three 8,000-gallon gasoline USTs. All three 8,000-gallon gasoline USTs were located in a shared tank pit located to the south of the gasoline dispensers and canopy. Reportedly, the 8,000-gallon gasoline USTs were installed during March 1982. This UST system was removed in January 2024 as the Site ceased retail sales of petroleum products. A total of 14 soil samples were collected during closure activities including samples beneath the USTs, dispensers, and piping, and a sample of the material used as backfill. Concentrations of benzene, ethylbenzene, and toluene were identified above SHS in a sample collected beneath UST 003.

2.3.2 Monitoring Well Installation

An environmental assessment was conducted at the Site on behalf of Sunoco for divestment purposes beginning in May 1997. The subsequent environmental investigation included the installation of monitoring wells at the Site due to identified groundwater impact.

The initial environmental assessment included the installation of four groundwater wells (OW-1 through OW-4). These wells were gauged and sampled to assess the presence and extent of groundwater impact.

On October 12, 2000, two additional monitoring wells (OW-5 and OW-6) were installed to gain better characterization of groundwater contamination at the Site.

On March 19, 2009, two additional monitoring wells (OW-7 and OW-8) were installed near the western property boundary to serve as downgradient point of compliance wells. These eight onsite wells were abandoned at the conclusion of the environmental investigation in November 2019.

The current monitoring well network and groundwater sampling is further discussed in **Section 3.0**.

2.3.3 Aquifer Testing

A Remedial Feasibility Study was conducted and submitted to PADEP on August 11, 2000, which included an eight hour pump test conducted on OW-1. The water measurements collected during the pump test were evaluated using the Cooper & Jacob time-drawdown Method, Neuman's Method, and the Thesis Method and generated calculations for transmissivity and hydraulic conductivity. The fate and transport of impacted groundwater as well as site modeling will be further discussed in **Section 3.5**.

2.3.4 Soil Boring Investigation

Eight soil samples were collected at the Site using systematic random sampling during March 2009 to identify and soil impacts at the Site. In these samples, one sample contained concentrations of benzene above SHS, however the samples as a collective attained SHS through the 75%/10x rule.

As a result of the August 2023 release, Synergy conducted a limited soil investigation at the Site to assess the potential presence of soil impacts. The current soil investigation is further discussed in **Section 3.0**.

2.3.5 Remedial Actions

During the environmental assessment initiated in 1997, groundwater impacts were identified at the Site. Approximately 1,146 gallons of petroleum impacted groundwater was extracted through high volume extraction (HVE) from the observation wells. In December 2002, 10 injection wells were installed for the purposes of an ozone injection system to remediate groundwater impacts at the Site. The system was installed and began operating in April 2003 until June 2006. Quarterly

groundwater monitoring occurred at the Site until the submission of a Remedial Action Completion Report (RACR) in November 2019.

3.0 Site Characterization

Synergy was retained by Gatz Automotive, Inc. (Gatz) to complete the site characterization activities for the Site after a release of a petroleum product that was first reported in August 2023. Synergy acquired the responsibility for the environmental investigation at the Site on March 25, 2024. Site characterization tasks conducted to date include the advancement of twelve soil borings resulting in the collection of seventeen soil samples to characterize and delineate soil impacts. Additionally, eight monitoring wells have been installed at the Site to assess groundwater conditions and delineate petroleum impacted groundwater.

3.1 Soil Evaluation

The following sections detail the investigation into soil contamination during the Site Characterization period.

3.1.1 August 2024 Soil Investigation

Synergy mobilized to the Site during August 16, 2024 to conduct an initial soil boring investigation to delineate and assess soil conditions at the Site. Proposed soil boring locations were selected based upon the initial release at the north end of UST 003. Prior to the advancement of the soil borings, an air knife and vacuum were utilized to pre-clear boring locations to verify the absence or presence of underground utilities within the first 5 feet of each boring location prior to the advancement of the borings. Soil was collected using a direct push truck-mounted geoprobe. A total of 6 soil borings (24-SB-1 through 24-SB-6) were advanced during the investigation. Each boring was advanced until equipment refusal or to a depth of 20 feet bgs if no evidence of impact is observed. For each boring, the recovered soils were screened with a photoionization detector (PID), inspected for visual or olfactory indications of petroleum contamination, and classified by Synergy field personnel. Samples were selected for laboratory analysis based upon PID screening results, field observations, or the soil's location relative to the initial impact.

A total of 6 samples were collected and submitted to ALS Global Laboratories of Middletown, Pennsylvania for analysis of PADEP unleaded gasoline new list parameters including: benzene, toluene, ethylbenzene, total xylenes, methyl tert-butyl ether, naphthalene, isopropylbenzene (cumene), 1,2,4 – trimethylbenzene (TMB), and 1,3,5 – TMB via EPA Method 8260C. The samples were placed in laboratory provided bottleware, labeled, and placed in a cooler packed with ice and maintained at a temperature of approximately 4˚ Celsius. Soil analytical results from the August 2024 soil investigation are summarized in **Table 1**. Soil sample locations are depicted on **Figure 4**.

3.1.2 November 2024 Soil Boring Investigation

During November 4-5, 2024, Synergy returned to the Site and advanced 6 additional soil borings (24-SB-7 through 24-SB-12). The locations of the soil borings were selected based upon the analytical results from the previous soil boring event conducted during August 2024. Prior to the advancement of the soil borings, an air knife and vacuum were utilized to pre-clear boring locations to verify the absence or presence of underground utilities within the first 5 feet of each

boring location. Soil was collected using a direct push truck-mounted geoprobe. Each boring was advanced until equipment refusal or to a depth of 20 feet bgs if no evidence of impact is observed. For each boring, the recovered soils were screened with a photoionization detector (PID), inspected for visual or olfactory indications of petroleum contamination, and classified by Synergy field personnel. Samples were selected for laboratory analysis based upon PID screening results, field observations, or the soil's location relative to the previously identified impact.

A total of 11 samples were collected and submitted to ALS Global Laboratories of Middletown, Pennsylvania for analysis of PADEP unleaded gasoline new list parameters for this round of soil sampling. The samples were placed in laboratory provided bottleware, labeled, and placed in a cooler packed with ice and maintained at a temperature of approximately 4˚ Celsius. Soil analytical results from the November 2024 soil investigation are summarized in **Table 1**. Soil sample locations are depicted on **Figure 4**.

3.1.3 Soil Analytical Results

Soil analytical results from the August 2024 soil boring investigation indicated that one of the six samples collected during the event reported at least one parameter in exceedance of a respective NRSHS. Analytical results indicated exceedances of benzene, toluene, and ethylbenzene in 24-SB-1. Benzene was detected exceeding the NRSHS (0.5 mg/kg) with a concentration of 5.56 mg/kg. Toluene was detected exceeding the NRSHS (100 mg/kg) with a concentration of 183 mg/kg. Ethylbenzene was detected exceeding the NRSHS (70 mg/kg) with a concentration of 70.5 mg/kg. The locations and analytical results of the August 2024 soil boring investigation are shown on **Figure 4**. Analytical results for the soil samples collected during the soil boring investigation are summarized on **Table 1**.

Soil analytical results from the November 2024 soil boring investigation indicated that none of the six borings identified any target parameters in exceedance of NRSHS. The locations and analytical results of the November 2024 soil boring investigation were selected to delineate impacts from the August 2024 soil sampling event and are shown on **Figure 4**. Analytical results for the soil samples collected during the soil boring investigation are summarized on **Table 1**.

3.2 Groundwater Evaluation

The following sections detail the investigation into groundwater contamination during the Site Characterization period.

3.2.1 Groundwater Sampling

Five rounds of groundwater samples have been conducted at the Site since Site characterization was initiated. Synergy conducted groundwater sampling activities during November 22, 2024, December 13, 2024, and January 17, 2025 for the original monitoring well network of MW-1 through MW-4. Synergy also conducted groundwater sampling activities during March 13, 2025 and April 9, 2025 for the complete monitoring well network of MW-1 through MW-8. Groundwater samples collected at the Site have been analyzed for Pennsylvania unleaded

gasoline (new list) (PAUG) short list target parameters including: benzene, toluene, ethylbenzene, total xylenes, MTBE, isopropylbenzene (cumene), naphthalene, 1,2,4-TMB, and 1,3,5-TMB

During groundwater sampling events, the monitoring wells were gauged and the depth to water and total depth of each well were measure with an oil/water interface probe capable of measuring water and/or LNAPL to within 0.01 feet. The interface probe was decontaminated between each well using Alconox and distilled water to avoid potential cross-contamination. Following gauging, volumetric measurements were calculated and the wells were purged through granular activated carbon units.

Following purging, samples were collected using a dedicated polyethylene bailer and string. The bailer was slowly lowered into the well for sample collection to avoid the potential for sample volatilization. The groundwater collected within the bailer was then transferred to laboratory provided bottleware. The sample bottleware contained hydrochloric acid (HCl) as a preservative. Samples were labeled and immediately placed in an ice packed cooler maintained at approximately 4˚ Celsius. The samples were dropped off at an associated ALS service center. The samples were handled under typical chain-of-custody procedures from the time of sample through analysis at the laboratory. The two most recent groundwater sampling events of the full monitoring well network are described below.

3.2.1.1 March 13, 2025 Sampling Event

Monitoring wells MW-1 through MW-8 were gauged, purged and sampled as part of this sampling event. Depth to groundwater measurements ranged from 35.94 (MW-8) feet to 38.13 (MW-6) feet from top of casing. Groundwater elevations ranged from 72.99 (MW-6) to 73.23 (MW-1). LNAPL was not detected in any of the monitoring wells. Groundwater flow was determined to be towards the west-southwest with a gradient of 0.0025 ft/ft based upon gauging data. Groundwater analytical results are discussed in **Section 3.2.3**.

Figure 5 shows the groundwater contours and flow direction for the sampling event. **Figure 6** depicts the groundwater analytical data for this sampling event. Groundwater gauging and analytical data are summarized on **Table 2**.

3.2.1.2 April 9, 2025 Sampling Event

Monitoring wells MW-1 through MW-8 were gauged, purged and sampled as part of this sampling event. Depth to groundwater measurements ranged from 36.22 (MW-8) feet to 38.34 (MW-6) feet from top of casing. Groundwater elevations ranged from 72.78 (MW-6) to 73.02 (MW-1). LNAPL was not detected in any of the monitoring wells. Groundwater flow was determined to be towards the west with a gradient of 0.0025 ft/ft based upon gauging data. Groundwater analytical results are discussed in **Section 3.2.3**.

Figure 7 shows the groundwater contours and flow direction for the sampling event. **Figure 8** depicts the groundwater analytical data for this sampling event. Groundwater gauging and analytical data are summarized on **Table 2**.

3.3 Vapor Intrusion Evaluation

The following sections detail the investigation into groundwater contamination during the Site Characterization period:

3.3.1 Vapor Intrusion – Soil

Soil analytical data collected to date has indicated benzene, toluene, and ethylbenzene present in Site soil above their respective SHS Vapor Intrusion Soil Screening Values. The guidance states that the vertical proximity distance is five feet and the horizontal distance is 30 feet for adsorbed phase contamination. The nearest exceedance to the occupied auto garage is 24-SB-1, which is located 17.5 feet below ground surface and 50 horizontal feet from the garage. Therefore, the soil exceedances above the Vapor Intrusion Soil Screening Values would not represent a potential source of vapors to the onsite building. Evaluation of analytical data collected to date and the use of the proximity distances presented within the guidance indicated Site soil does not present a vapor intrusion risk at this time. Since the exceedances observed in Site soil are either at depths greater than 5 feet (with acceptable soil material above) and/or greater than 30 feet from the Site building, there is adequate distance for biodegradation to occur to reduce concentrations to acceptable levels.

3.3.2 Vapor Intrusion – Groundwater

From the groundwater analytical data collected to date, only benzene has historically been detected at concentrations in exceedance of its respective Groundwater SHS Vapor Intrusion Screening Value in MW-1 and MW-3. The guidance states that the vertical proximity distance for petroleum-impacted groundwater is 5 feet. The shallowest depth to groundwater measurement collected during gauging was 35.02 feet below top of casing. This measurement was the shallowest any groundwater was identified within a Site well. Therefore, due to the vertical distance to the petroleum impacted groundwater, the vertical proximity distance would indicate there is adequate distance for biodegradation to occur to reduce concentrations to acceptable levels. Additionally, no exceedances of groundwater screening values or LNAPL have been noted to date within 30 feet of the Site building. Therefore, based on the analytical data collected to date, Site groundwater does not present a vapor intrusion risk at this time.

3.4 Results of Site Characterization Study

The following sections detail the results of the site characterization activities performed at the Site:

3.4.1 Separate-Phase Hydrocarbons – Not Observed

Separate phase hydrocarbons (SPH) were not observed during any groundwater sampling activities.

3.4.2 Soil Quality

The two soil boring investigations conducted at the Site to date have indicated that soil impact was identified at one location in 24-SB-1. The impact in 24-SB-1 was noted at 17.5 to 18 feet

bgs. Refusal was encountered at 18 feet bgs, so a deeper soil sample could not be obtained in that soil boring. Benzene, toluene and ethylbenzene have all been detected in exceedance of their respective NRSHS. The identified soil impact at 24-SB-1 is located in the vadose zone with the first water table encountered around 35 feet bgs. A number of soil borings were advanced around 24-SB-1 in order to delineate the identified impact, but all samples returned all gasoline parameters below NRSHS. **Table 1** provides the analytical result summaries from each soil sampling event. **Figure 4** depicts a comprehensive view of sampling locations and soil sampling analytical results for samples collected to date.

3.4.3 Groundwater Quality – Exceedances of the NRSHS

Five groundwater sampling events have been conducted at the Site since characterization activities were initiated. The initial sampling event was conducted during November 22, 2024. The following exceedances were reported for this sampling event:

- MW-1: benzene (203 µg/L)
- MW-2: benzene (20.2 µg/L) and MTBE (22.1 µg/L)

In the four groundwater sampling events that have occurred since this initial event, benzene has been identified above NRSHS in MW-3 and there has been one detection of benzene above NRSHS in MW-4, which has not been replicated. No LNAPL has been identified at the Site in any of the groundwater sampling events conducted to date.

After three groundwater sampling events of MW-1 through MW-4, an additional four wells (MW-5 through MW-8) were installed at the Site to address groundwater impact delineation. There have not yet been detections of PAUG parameters above NRSHS in these additional wells. **Figures 5** through **8** depict the groundwater analytical summary for the most recent two sampling events at the Site. Groundwater gauging and analytical data are summarized on **Table 2**.

3.4.4 Vapor Intrusion Conclusion – Not A Concern

Based upon the soil and groundwater analytical data collected to date and review of the PADEP Vapor Intrusion Guidance Manual, conditions do not currently exist at the Site that would warrant a vapor intrusion investigation. These conditions along with evaluation of offsite vapor receptors will continue to be evaluated as the investigation at the Site progresses.

3.5 Contaminant Fate and Transport

Synergy prepared the Quick Domenico (QD) model in the Site Characterization Report (SCR), submitted June 13, 2025, to predict the migration of dissolved phase contaminates in Site groundwater.

3.5.1 Model Description

Quick Domenico (QD) was used to calculate the distance and concentrations of dissolved organic constituents over a 30-year period to estimate the extent of contaminant transport for contaminants in groundwater. The QD model assumes steady-state flow conditions in a

homogeneous, unconsolidated aquifer. The model considers first-order decay, retardation and three-dimensional dispersion. In the QD model, concentrations are calculated for a single species and reactions between constituents are not considered. The QD model provides a conservative estimate of compound migration based on the assumption that contaminants are continuously introduced into the aquifer at the specified input concentration and over the entire specified time period being modeled.

3.5.2 Model Input Parameters

Source Concentrations: **Starting Concentrations and Date:**

5 year and 30-Year Prediction

Benzene MW-1: 0.666 mg/l (max. over SC period)

Dispersivity Values: Dispersivity values were calculated following the basic principles below utilizing time intervals specific to the term of the model prediction.

A_x = X/10; where X = groundwater velocity ($V_{seepage}$) * Time
Ay = Ax/10
Az = 0.0001 (QD default value)
$V_{seepage}$ = (hydraulic conductivity * hydraulic gradient) / (effective porosity)

Attenuation Lambda (reference values from 25 PACode §250):

Benzene 0.000958

KOC (reference values from 25 PACode §250):

Benzene 58

Source Width: 30 feet (approximate width of former UST field)

Source Thickness: 3 feet (~smear zone thickness)

Hydraulic Conductivity ($K_{GeoMean}$): 0.39 feet/day (Calculated from pump test by previous consultant, Mulry and Cresswell Environmental, Inc. (2000), **Appendix B**)

Hydraulic Gradient ($\Delta h/lA_{verage}$): 0.0025 feet/feet (April 9, 2025 data)

Effective Porosity (n_e): 0.3 (book value based on rock type)

Soil Bulk Density: 1.8 g/cm^3

Fraction of Organic Carbon: 0.005

Term (predication): 30 year (10,950 days)

3.5.3 Fate and Transport Modeling Results

Benzene is the primary constituent of concern to exceed the NRSHS at the Site resulting from the August 2023 release. MTBE is also identified above NRSHS, but it is only present in the source well above NRSHS levels. Benzene has not been identified in MW-5, which is downgradient of the source and along the property boundary, and is only anticipated to travel 14 feet during a 30-year period based on a starting concentration of 666 ug/L (maximum value during the Site Characterization period). No point of compliance exceedances are anticipated. The Domenico spreadsheets are included in **Appendix C**.

4.0 Remedial Action Plan

4.1 Evaluation of Remedial Alternatives

The following section provides a description of remedial response alternatives that could be implemented to remediate the dissolved phase contaminants at the Site.

4.1.1 No Further Action

The No Further Action alternative would rely on natural attenuation or biodegradation of contaminants to remediate the Site. Natural attenuation as defined by the United States Environmental Protection Agency (USEPA, 1999) refers to all of the physical, chemical, or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of chemicals in soil or groundwater.

Due to the extent of contamination, it does not appear likely that this strategy would result in attainment of SHS and is therefore not feasible.

4.1.2 Soil Remediation by Excavation and Disposal

Remediation by excavation and offsite disposal is generally feasible when most or all of the soils may be physically removed. Impact to the soils at the Site do appear to be above the saturated zone, however the impact does not begin until approximately 18 feet bgs. This would require a significant amount of soil removal for one location of impact that was identified. Excavating soils at the Site to remove the identified impact is not a feasible remedial alternative due to the amount of soil required to be removed to get to the area of impacted soil.

4.1.3 Groundwater Remediation by Pump and Treatment

Groundwater remediation by pump and treatment utilizes recovery wells to pump contaminated water from affected aquifer, which is treated at the surface and discharged to a surface water body, infiltration gallery, or under permit to a publicly operated treatment works (POTW). This alternative achieves two primary goals; 1) contaminated groundwater is extracted from the saturated zone, and 2) contaminated water within the recovery well's radius of influence is prevented from migrating offsite.

The pump and treat alternative could be effective in treating the contaminated groundwater and preventing further migration from the Site but it was determined that this alternative was not the most effective remedial strategy for the Site at this time. The current Fate and Transport modeling indicates that contamination is unlikely to migrate offsite and the cost of installation and maintenance of a mechanical system is significantly higher than believed necessary at this time.

4.1.4 Groundwater Remediation by Ozone Injection

Ozone is much more chemically reactive than ordinary oxygen. It is used to purify water, sterilize air, and bleach and disinfect certain foods. Ozone decomposes spontaneously in water.

The solubility of ozone depends on water temperature, the ozone concentration in the vapor phase, and the efficiency of the mass transfer device used.

Ozone is an unstable, free radical form of oxygen used to oxidize compounds of concern at many remediation sites. Because ozone is unstable, only existing in its free radical state for a short time, it is generated at the point of use. It is produced for industrial use when voltage is applied to electrodes, and the electrons flow across a gap and provide energy for the disassociation of oxygen molecules, which leads to the formation of ozone. If oxidizable chemicals are present in water, larger amounts of ozone will dissolve to satisfy the demand. Ozone injected into groundwater reacts directly with hydrocarbon compounds, destroying them on contact. It also increases aerobic conditions in the groundwater for bioremediation.

An ozone injection system operated previously at this Site from 2003 to 2006 to address petroleum impact. Similarly to the Pump and Treat option, the localized impact from this release renders this remediation alternative excessive for the Site's needs considering the cost of installing and maintaining such a physical remediation system.

4.1.5 Chemical Injection – Regenesis RegenOx® compound

Per the manufacturer, RegenOx is a two-part chemical oxidant (a liquid and a solid) that destroys contaminants by means of robust chemical reactions. The injection material will create a significant, short-term oxygen footprint to quickly establish follow-on aerobic degradation conditions. The product maximizes in-situ chemical oxidation performance through the use of a two-part product system; a sodium percarbonate oxidizer complex activated by a patented surface catalyst system. The technology degrades pollutants through direct oxidation, as well as through the generation of a suite of free radical compounds which in turn oxidize recalcitrant contaminants. Per the manufacturer, RegenOx is especially effective in destroying target contaminants present in high concentration source areas within the saturated and vadose zones. It should also be noted that RegenOx is safe to use in direct contact with underground utilities since it is non-corrosive to most materials.

This method would require the installation of remediation wells used to inject the chemical compound into the ground. The installation of remediation wells would enable the re-application of the injection materials if progress appears to occur towards remediation, but additional material is required.

4.2 Selected Remedial Alternative

Several remedial alternatives have been evaluated to determine their feasibility to remediate the Site. Synergy recommends remediating the Site through the use of chemical injections with the Regenesis RegenOx® compound. As stated earlier, the fate and transport model shows that the impact is unlikely to migrate offsite under current conditions, so a mechanical remediation system would be excessive for the needs of the remediation. Chemical injections allow for the targeting of impacted areas and the use of dedicated remediation wells allows for relatively inexpensive re-application, if necessary.

4.3 Proposed Actions: Remedial Injections

The proposed chemical injections would attempt to target both the soil and groundwater impact identified at the Site.

Prior to the initiation of the remedial injections, Synergy will mobilize to the site to install 4-inch remediation wells where the chemical compound will be injected. The wells will be installed at different intervals to remediate different areas. A “shallow” remediation well will be installed in the area of the identified soil impact to a depth of 16’ to directly attack the soil impact. Three “deep” remediation wells are to be installed to inject the chemical compound into the water table. Two wells in the vicinity of the source well, MW-1, would address the source impact and one well upgradient to address impacts identified in MW-3.

Prior to the injections, a hydraulic test will be conducted at the site as recommended by the product manufacturer. The purpose of the test is to evaluate the hydraulic conductivity / volumetric limitations of the proposed injection area. During the hydraulic test, a known volume of water will be inserted into the UST pit injection piping. Following the test, it will be determined specifically what volume of material will be used during the remedial injections. It should be noted the consistency of the injection material does differ from water and therefore the rate at which the injection material is accepted by the subsurface may vary.

Synergy intends to inject approximately 480 pounds of RegenOX part A and 240 pounds of RegenOx part B in solution with approximately 950 gallons of water. Synergy is initially proposing conducting a series of injection events approximately one month apart. Following the first two injection events, Synergy will monitor the analytical results collected during the following quarterly sampling events to assess the effectiveness of the injections. If the injections appear to be effective at reducing concentrations of target parameters within site groundwater additional injection events may be proposed. Based on the results, it is possible the ratio / amount of material injected may be varied. Literature provided by the manufacturer is provided in **Appendix D**.

4.4 Additional Actions

Quarterly groundwater monitoring events will continue at the Site until PADEP NRSHS for a used aquifer is met.

TABLES

Table 1
Soil Analytical Data Summary
Gatz Auto
2899 Holme Ave., Philadelphia, PA
Synergy Project No. 24-01483

Sample ID	Date	Approximate Sample Depth (feet bgs)	PID (ppm/v)	Benzene (mg/kg)	Q	Toluene (mg/kg)	Q	Ethylbenzene (mg/kg)	Q	MTBE (mg/kg)	Q	Isopropyl benzene (mg/kg)	Q	Naphthalene (mg/kg)	Q	1,2,4-TMB (mg/kg)	Q	1,3,5-TMB (mg/kg)	Q	Total Xylenes (mg/kg)	Q
Statewide Health Standards - Soil to Groundwater [3]				0.5		100		70		2		2,500		25		300		93		1,000	
Statewide Health Standards - Vapor Intrusion Screening Values [3]				0.13		44		46		1.4		2,500		25		300		93		990	
Subsurface Soil Standards (2 to 15') [3]				330		10,000		1,000		9,800		10,000		77		5,400		5,400		9,100	
24-SB-1	8/16/2024	17.5-18	1327	**5.56**		**183**		**70.5**		ND (0.283)		9.76		7.93		214		57.7		535	
24-SB-2	8/16/2024	19.5-20	35.3	0.444		0.836		0.164		ND (0.0613)		ND (0.0613)		ND (0.123)		0.307		0.0791		0.969	
24-SB-3	8/16/2024	15-15.5	0.3	ND (0.0588)		ND (0.0588)		ND (0.0588)		ND (0.0588)		ND (0.0588)		ND (0.118)		0.267		0.106		ND (0.176)	
24-SB-4	8/16/2024	14.5-15	1.1	ND (0.0634)		ND (0.0634)		ND (0.0634)		ND (0.0634)		ND (0.0634)		ND (0.127)		0.966		ND (0.0634)		ND (0.190)	
24-SB-5	8/16/2024	15.5-16	0.0	ND (0.0758)		0.0891		ND (0.0758)		ND (0.0758)		ND (0.0758)		ND (0.152)		ND (0.0758)		ND (0.0758)		ND (0.227)	
24-SB-6	8/16/2024	15.5-16	0.0	ND (0.0471)		ND (0.0471)		ND (0.0471)		ND (0.0471)		ND (0.0471)		ND (0.0943)		ND (0.0471)		ND (0.0471)		ND (0.141)	
24-SB-7	11/5/2024	17.5-18	0.0	ND (0.0628)		ND (0.0628)		ND (0.0628)		ND (0.0628)		ND (0.0628)		ND (0.126)		ND (0.0628)		ND (0.0628)		ND (0.188)	
24-SB-8	11/5/2024	17.5-18	0.0	ND (0.0607)		ND (0.0607)		ND (0.0607)		ND (0.0607)		ND (0.0607)		ND (0.121)		ND (0.0607)		ND (0.0607)		ND (0.182)	
24-SB-9	11/5/2024	13.5-14	0.0	ND (0.0739)		ND (0.0739)		ND (0.0739)		ND (0.0739)		ND (0.0739)		ND (0.148)		ND (0.0739)		ND (0.0739)		ND (0.222)	
24-SB-10	11/5/2024	17.5-18	0.0	ND (0.0681)		ND (0.0681)		ND (0.0681)		ND (0.0681)		ND (0.0681)		ND (0.136)		ND (0.0681)		ND (0.0681)		ND (0.204)	
24-SB-10D	11/5/2024	19.5-20	397.1	ND (0.0539)		0.0599		0.903		ND (0.0539)		0.353		9.24		24.1		6.79		6.56	
24-SB-10DD	11/5/2024	22.5-23	671.5	0.0808		5.84		16.7		ND (0.0584)		4.24		21.4		152		46.5		111	
24-SB-11	11/5/2024	17.5-18	0.0	ND (0.0621)		ND (0.0621)		ND (0.0621)		ND (0.0621)		ND (0.0621)		ND (0.124)		ND (0.0621)		ND (0.0621)		ND (0.186)	
24-SB-11D	11/5/2024	19.5-20	0.0	ND (0.0624)		ND (0.0624)		ND (0.0624)		ND (0.0624)		ND (0.0624)		ND (0.125)		ND (0.0624)		ND (0.0624)		ND (0.187)	
24-SB-12	11/5/2024	17.5-18	0.0	ND (0.0636)		ND (0.0636)		ND (0.0636)		ND (0.0636)		ND (0.0636)		ND (0.127)		ND (0.0636)		ND (0.0636)		ND (0.191)	
24-SB-12D	11/5/2024	19.5-20	0.0	ND (0.0608)		ND (0.0608)		ND (0.0608)		ND (0.0608)		ND (0.0608)		ND (0.122)		ND (0.0608)		ND (0.0608)		ND (0.182)	
24-SB-12DD	11/5/2024	21.5-22	0.0	ND (0.0633)		ND (0.0633)		ND (0.0633)		ND (0.0633)		ND (0.0633)		ND (0.127)		ND (0.0633)		ND (0.0633)		ND (0.190)	

Total Number of Samples				17		17		17		17		17		17		17		17		17	
Total Number of Detections				3		5		4		0		3		3		6		5		4	
Total Number of Exceedances - STG				1		1		1		0		0		0		0		0		0	
Total Number of Exceedances - Vapor Intrusion				2		1		1		0		0		0		0		0		0	
Total Number of Exceedances - DC				0		0		0		0		0		0		0		0		0	

1. mg/Kg - Milligrams per Kilogram
   bgs - Below Ground Surface
   N/A - Not applicable
   ND - Not detected at RL in ( )
   RL - Reporting Limit
   Q - Qualifier
   STG - Soil to Groundwater
   VI - Vapor Intrusion
   DC - Direct Contact
2. See laboratory report for additional information.
3. PADEP Act 2 Non-Residential Statewide Health Standards (Soil) and Guidance Values (Vapor Intrusion). Exceedances are indicated as follows:

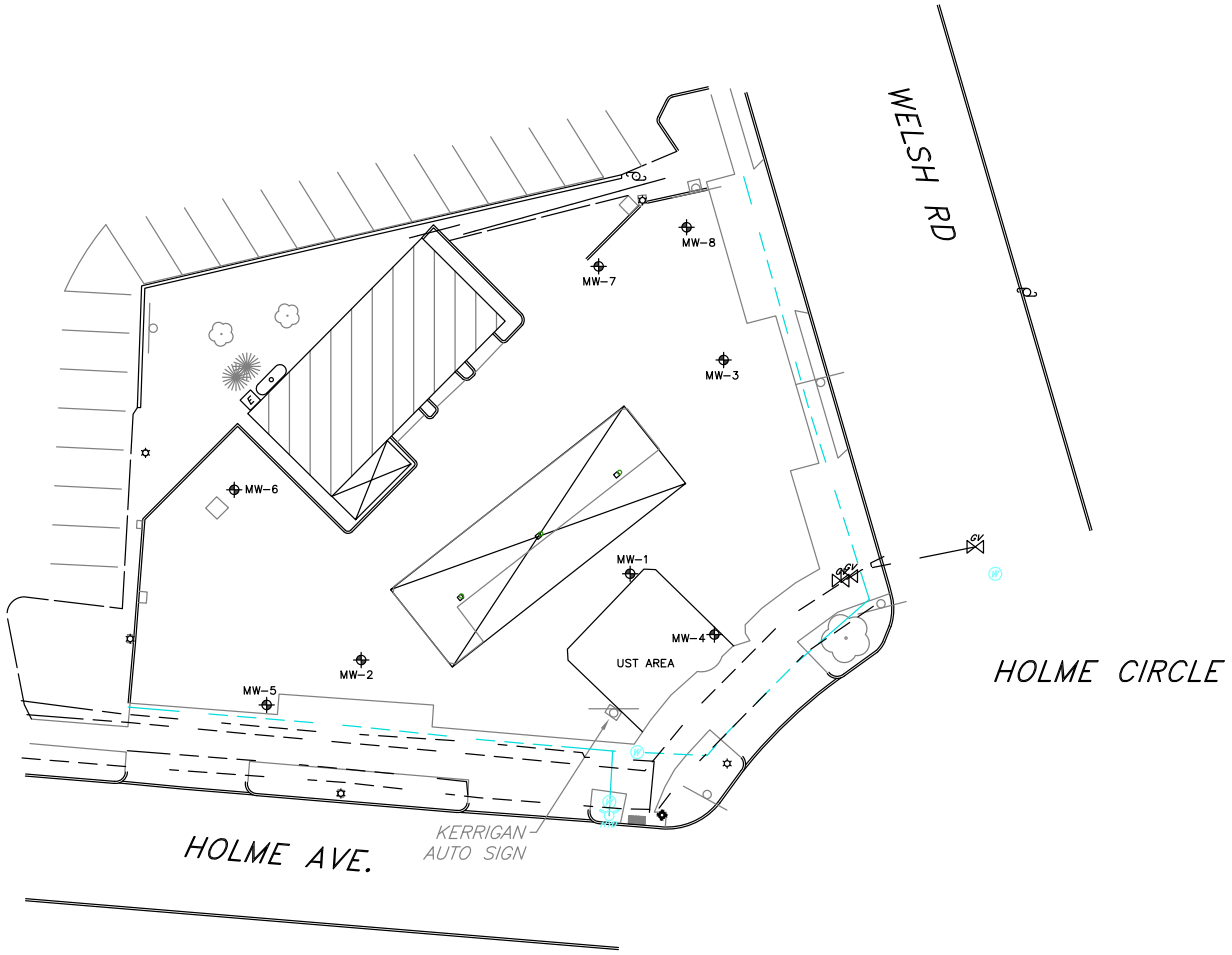
STG
VI
DC

Table 2 Historic Groundwater Sampling Data Summary
Gatz Auto - 2899 Holme Avenue Philadelphia, PA
Facility ID No. 51-30277
Synergy Project No. 24-01483

Well ID	Date	Top of Casing (ft.)	Depth To Bottom	Depth To Water	Depth to Product	Product Thickness	Ground Water Elevation	Benzene	Q	Toluene	Q	Ethyl benzene	Q	MTBE	Q	Naphthalene	Q	Cumene	Q	1,2,4 TMB	Q	1,3,5 TMB	Q	Total Xylenes	Q
			(feet)	(feet)	(feet)	(feet)	(feet)	(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)	
PADEP Act 2 Statewide Health- Non-Residential Used Aquifer								5		1,000		700		20		100		3,500		530		530		10,000	
PADEP Groundwater Non-Residential Vapor Intrusion Screening Values								350		430,000		860		96,000		1,300		24,000		6,400		4,500		12,000	
MW-1	11/22/2024	111.11	50.32	36.47	NP	0.00	74.64	**203**		839		75.3		ND (1.0)		0.35	*J*	3.5		33.6		10.0		485	
	12/13/2024	111.11	50.32	36.87	NP	0.00	74.24	***622***		**1970**		161		ND (10.0)		ND (20.0)		ND (10.0)		39.9		11.9		774	
	1/17/2025	111.11	50.32	37.27	NP	0.00	73.84	**330**		541		65.5		ND (10.0)		9.0	*J*	6.5	*J*	78.8		21.1		327	
	3/13/2025	111.11	50.32	37.88	NP	0.00	73.23	**136**		211		45.4		ND (10.0)		ND (20.0)		ND (10.0)		ND (10.0)		ND (10.0)		109	
	4/9/2025	111.11	50.32	38.09	NP	0.00	73.02	**98.6**		196		29.4		0.66	*J*	ND (2.0)		2.3		11.6		4.5		165	
MW-2	11/22/2024	110.85	50.31	36.23	NP	0.00	74.62	**20.2**		28.5		7.5		**22.1**		24.8		4.1		21.2		11.7		31.6	
	12/13/2024	110.85	50.31	36.72	NP	0.00	74.13	**24.4**		28.3		8.7		16.6		44.5		8.3		24.3		14.0		32.6	
	1/17/2025	110.85	50.31	37.13	NP	0.00	73.72	**34**		1.4		7.6		**31**		43.5		6.3		29.5		19.8		29.7	
	3/13/2025	110.85	50.31	37.77	NP	0.00	73.08	**54**		1.4		10.2		**23.7**		45.7		11.3		30.8		28.6		35.4	
	4/9/2025	110.85	50.31	37.99	NP	0.00	72.86	**48.5**		1.4		8.0		**26.6**		29.6		8.0		23.3		22.3		28.5	
MW-3	11/22/2024	109.61	50.25	35.02	NP	0.00	74.59	1.5		0	*J*	ND (1.0)		7.9		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		1.0	
	12/13/2024	109.61	50.25	35.44	NP	0.00	74.17	**85**		ND (1.0)		ND (1.0)		6.5		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		6.8	
	1/17/2025	109.61	50.25	35.76	NP	0.00	73.85	**163**		ND (1.0)		ND (1.0)		5.2		1	*J*	0.93	*J*	0.32	*J*	ND (1.0)		11.1	
	3/13/2025	109.61	50.25	36.41	NP	0.00	73.20	***421***		ND (1.0)		ND (1.0)		4.5		ND (2.0)		3.0		ND (1.0)		ND (1.0)		21.2	
	4/9/2025	109.61	50.25	36.66	NP	0.00	72.95	***416***		ND (5.0)		ND (5.0)		5.0	*J*	ND (10.0)		3.4	*J*	ND (5.0)		ND (5.0)		21.8	
MW-4	11/22/2024	110.66	50.18	36.05	NP	0.00	74.61	0.24	*J*	0.2	*J*	ND (1.0)		ND (1.0)		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
	12/13/2024	110.66	50.18	36.46	NP	0.00	74.20	**7.9**		67.8		5.6		ND (1.0)		ND (2.0)		ND (1.0)		1.7		ND (1.0)		31.1	
	1/17/2025	110.66	50.18	36.85	NP	0.00	73.81	0.68	*J*	ND (1.0)		ND (1.0)		0.58	*J*	ND (2.0)		ND (1.0)		0.72	*J*	0.24	*J*	1.4	*J*
	3/13/2025	110.66	50.18	37.49	NP	0.00	73.17	ND (1.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
	4/9/2025	110.66	50.18	37.72	NP	0.00	72.94	ND (1.0)		ND (1.0)		ND (1.0)		0.84	*J*	ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
MW-5	3/13/2025	110.21	50.01	37.17	NP	0.00	73.04	ND (1.0)		ND (1.0)		7.0		4.0		34.2		12.3		198		54.7		43.1	
	4/9/2025	110.21	50.01	37.37	NP	0.00	72.84	ND (5.0)		1.4	*J*	5.5		2.0	*J*	22.0		13.4		166		49.8		23.5	
MW-6	3/13/2025	111.12	49.85	38.13	NP	0.00	72.99	ND (1.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
	4/9/2025	111.12	49.85	38.34	NP	0.00	72.78	1.3		12.7		1.1		ND (1.0)		ND (2.0)		0.76	*J*	0.77	*J*	0.28	*J*	13.2	
MW-7	3/13/2025	110.29	47.84	37.10	NP	0.00	73.19	ND (1.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
	4/9/2025	110.29	47.84	37.34	NP	0.00	72.95	ND (1.0)		ND (1.0)		ND (1.0)		0.42	*J*	ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
MW-8	3/13/2025	109.14	38.85	35.94	NP	0.00	73.20	ND (1.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
	4/9/2025	109.14	38.85	36.22	NP	0.00	72.92	ND (1.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (2.0)		ND (1.0)		ND (1.0)		ND (1.0)		ND (3.0)	
			Total Number of Samples					28		28		28		28		28		28		28		28		28	
			Number of Detections					19		15		14		16		10		14		15		13		20	
			Number of Excedances Residential Statewide Health Standard					15		1		0		4		0		0		0		0		0	

Notes:
- = Not gauged, not calculated, not sampled, or not analyzed
BOLD = exceedence of the PADEP Act 2 Non-Residential Used Aquifer Statewide Health Standard,.
ITALIC - exceeds PADEP Groundwater Non-Residential Vapor Intrusion Screening Values
NP = Product not present
ND ( ) = Parameter not detected above laboratory reporting limit.
ND ()*= Parameter not detected above laboratory reporting limit above RSHS
MTBE = methyl tert butyl ether.
Q = Qualifier
J = Estimated value
* = Well plug not secure. Casing was flooded
Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
All samples analyzed by EPA Method 8260C.

FIGURES



LEGEND

Monitoring Well Location

Notes: – Site features and well locations obtained from survey performed by Bursich Associates, dated December 2024 and revised April 2025.

0 15 30
MAP SCALE

Synergy Environmental Inc.
Environmental Consultants
155 Railroad Plaza
First Floor
Royersford, PA 19468
P: 484-369-5000
F: 484-369-2000
W: www.synergyenvinc.com

FIGURE 1
Detailed Site Map
2899 Holme Avenue
Philadelphia, Pennsylvania

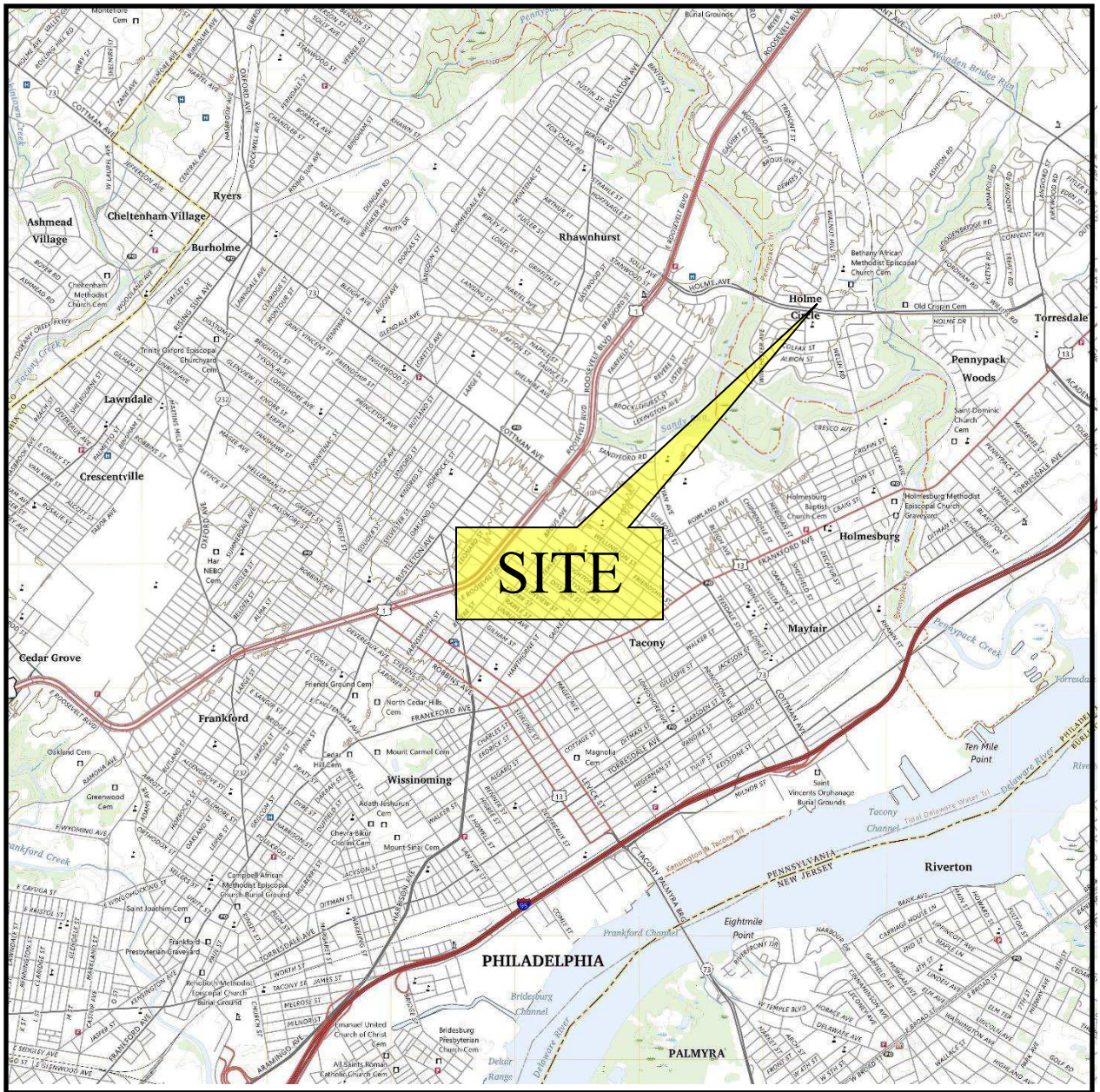
Drawn By:	Checked By:	Approved By:
EDF	RMH	RMH

Scale:	Dwg No:	Sheet:	Date:
1" = 30'	SE Gatz	Site	4–11–25

Synergy Project No.: 24–01483

Rev. Desc.:

File Path: G:\PDrive NonLG (A–J)\Gatz Auto\J – Drawings Figures\Gatz – Fig 1 – Site Map.pdf



Synergy Environmental Inc.
Environmental Consultants
155 Railroad Plaza, 1st Floor
Royersford, Pennsylvania 19468

Edited by:	Date:
R. Houck	July 2025
Project No.:	**Scale:**
24-01483	1:24,000

Figure 2 – Site Location Plan

Gatz Automotive, Inc.

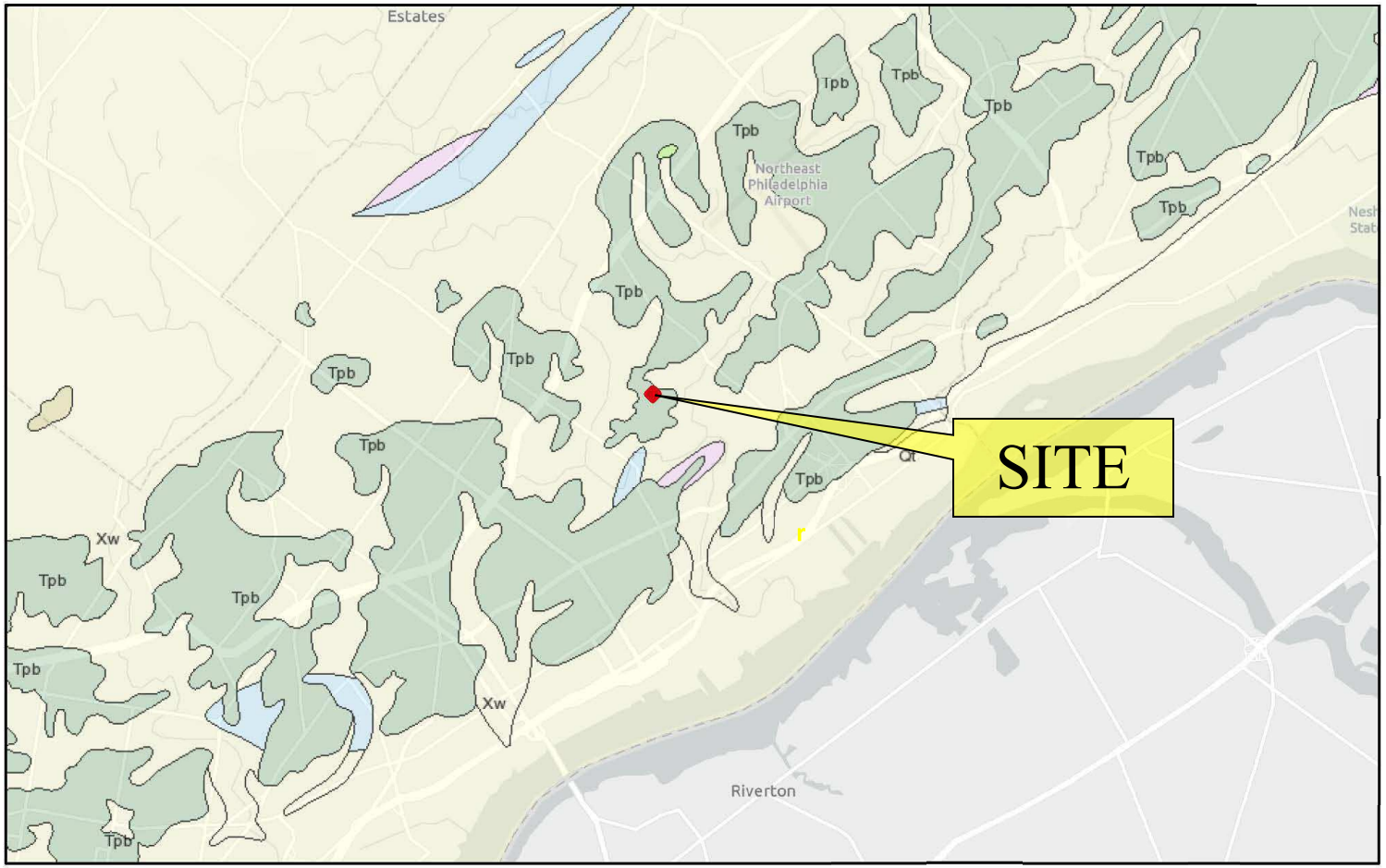
2899 Holme Ave.

Philadelphia, PA

N

USGS 7.5-minute Frankford, Pennsylvania Quadrangle Topographic Map, 2023.

Gatz Auto

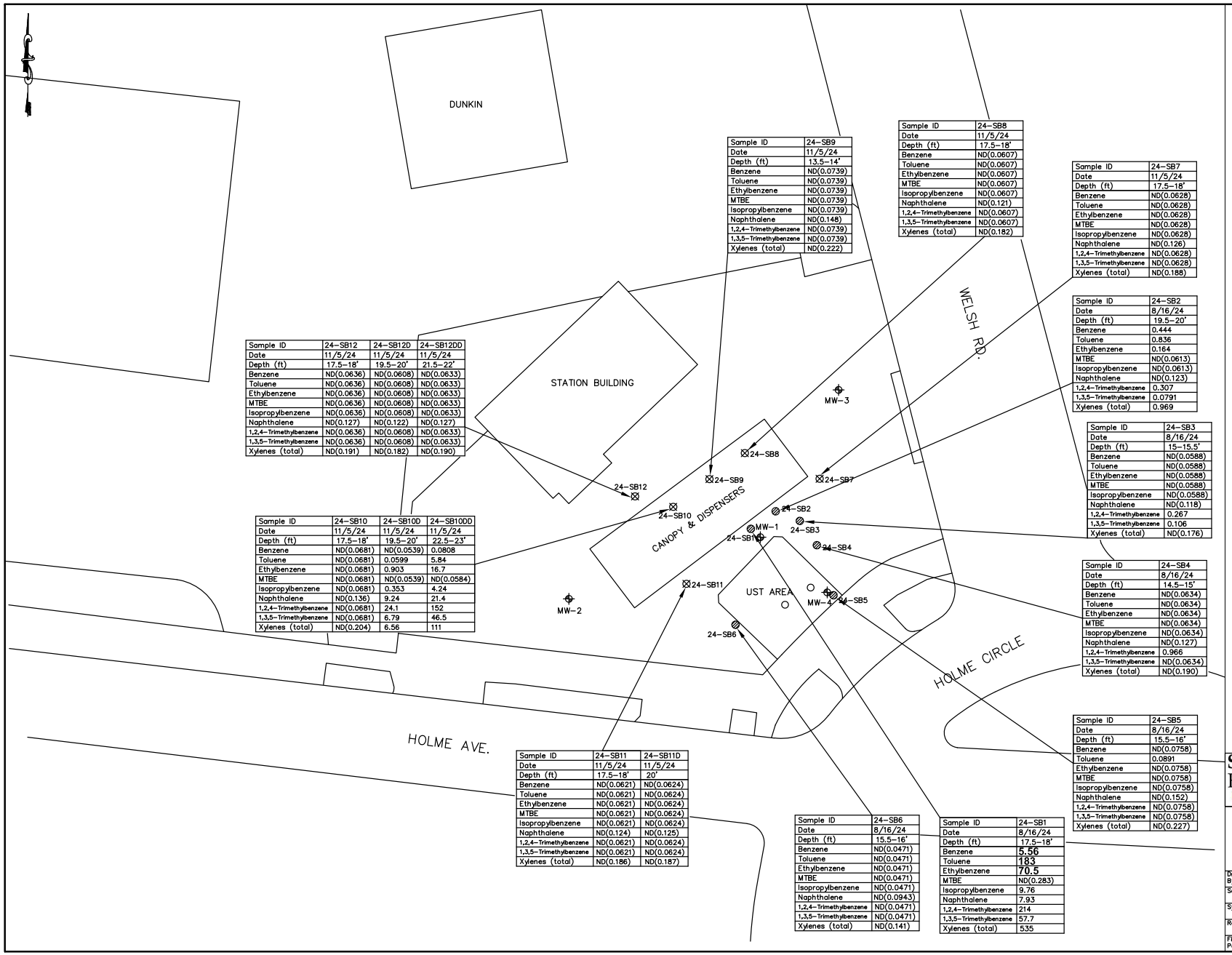


Synergy Environmental Inc.
Environmental Consultants
155 Railroad Plaza, 1st Floor
Royersford, Pennsylvania 19468

Project No.:	Scale:	Date:	Edited by:
24-01483	On Figure	May 2025	R. Houck

Figure 3 – Geologic Map

Gatz Auto
2899 Holme Avenue
Philadelphia, Philadelphia County, PA



Sample ID	24-SB12	24-SB12D	24-SB12DD
Date	11/5/24	11/5/24	11/5/24
Depth (ft)	17.5-18'	19.5-20'	21.5-22'
Benzene	ND(0.0636)	ND(0.0608)	ND(0.0633)
Toluene	ND(0.0636)	ND(0.0608)	ND(0.0633)
Ethylbenzene	ND(0.0636)	ND(0.0608)	ND(0.0633)
MTBE	ND(0.0636)	ND(0.0608)	ND(0.0633)
Isopropylbenzene	ND(0.0636)	ND(0.0608)	ND(0.0633)
Naphthalene	ND(0.127)	ND(0.122)	ND(0.127)
1,2,4-Trimethylbenzene	ND(0.0636)	ND(0.0608)	ND(0.0633)
1,3,5-Trimethylbenzene	ND(0.0636)	ND(0.0608)	ND(0.0633)
Xylenes (total)	ND(0.191)	ND(0.182)	ND(0.190)

Sample ID	24-SB10	24-SB10D	24-SB10DD
Date	11/5/24	11/5/24	11/5/24
Depth (ft)	17.5-18'	19.5-20'	22.5-23'
Benzene	ND(0.0681)	ND(0.0539)	0.0808
Toluene	ND(0.0681)	0.0599	5.84
Ethylbenzene	ND(0.0681)	0.903	16.7
MTBE	ND(0.0681)	ND(0.0539)	ND(0.0584)
Isopropylbenzene	ND(0.0681)	0.353	4.24
Naphthalene	ND(0.136)	9.24	21.4
1,2,4-Trimethylbenzene	ND(0.0681)	24.1	152
1,3,5-Trimethylbenzene	ND(0.0681)	6.79	46.5
Xylenes (total)	ND(0.204)	6.56	111

Sample ID	24-SB11	24-SB11D
Date	11/5/24	11/5/24
Depth (ft)	17.5-18'	20'
Benzene	ND(0.0621)	ND(0.0624)
Toluene	ND(0.0621)	ND(0.0624)
Ethylbenzene	ND(0.0621)	ND(0.0624)
MTBE	ND(0.0621)	ND(0.0624)
Isopropylbenzene	ND(0.0621)	ND(0.0624)
Naphthalene	ND(0.124)	ND(0.125)
1,2,4-Trimethylbenzene	ND(0.0621)	ND(0.0624)
1,3,5-Trimethylbenzene	ND(0.0621)	ND(0.0624)
Xylenes (total)	ND(0.186)	ND(0.187)

Sample ID	24-SB6
Date	8/16/24
Depth (ft)	15.5-16'
Benzene	ND(0.0471)
Toluene	ND(0.0471)
Ethylbenzene	ND(0.0471)
MTBE	ND(0.0471)
Isopropylbenzene	ND(0.0471)
Naphthalene	ND(0.0943)
1,2,4-Trimethylbenzene	ND(0.0471)
1,3,5-Trimethylbenzene	ND(0.0471)
Xylenes (total)	ND(0.141)

Sample ID	24-SB1
Date	8/16/24
Depth (ft)	17.5-18'
Benzene	5.56
Toluene	183
Ethylbenzene	70.5
MTBE	ND(0.283)
Isopropylbenzene	9.76
Naphthalene	7.93
1,2,4-Trimethylbenzene	214
1,3,5-Trimethylbenzene	57.7
Xylenes (total)	535

Sample ID	24-SB9
Date	11/5/24
Depth (ft)	13.5-14'
Benzene	ND(0.0739)
Toluene	ND(0.0739)
Ethylbenzene	ND(0.0739)
MTBE	ND(0.0739)
Isopropylbenzene	ND(0.0739)
Naphthalene	ND(0.148)
1,2,4-Trimethylbenzene	ND(0.0739)
1,3,5-Trimethylbenzene	ND(0.0739)
Xylenes (total)	ND(0.222)

Sample ID	24-SB8
Date	11/5/24
Depth (ft)	17.5-18'
Benzene	ND(0.0607)
Toluene	ND(0.0607)
Ethylbenzene	ND(0.0607)
MTBE	ND(0.0607)
Isopropylbenzene	ND(0.0607)
Naphthalene	ND(0.121)
1,2,4-Trimethylbenzene	ND(0.0607)
1,3,5-Trimethylbenzene	ND(0.0607)
Xylenes (total)	ND(0.182)

Sample ID	24-SB7
Date	11/5/24
Depth (ft)	17.5-18'
Benzene	ND(0.0628)
Toluene	ND(0.0628)
Ethylbenzene	ND(0.0628)
MTBE	ND(0.0628)
Isopropylbenzene	ND(0.0628)
Naphthalene	ND(0.126)
1,2,4-Trimethylbenzene	ND(0.0628)
1,3,5-Trimethylbenzene	ND(0.0628)
Xylenes (total)	ND(0.188)

Sample ID	24-SB2
Date	8/16/24
Depth (ft)	19.5-20'
Benzene	0.444
Toluene	0.836
Ethylbenzene	0.164
MTBE	ND(0.0613)
Isopropylbenzene	ND(0.0613)
Naphthalene	ND(0.123)
1,2,4-Trimethylbenzene	0.307
1,3,5-Trimethylbenzene	0.0791
Xylenes (total)	0.969

Sample ID	24-SB3
Date	8/16/24
Depth (ft)	15-15.5'
Benzene	ND(0.0588)
Toluene	ND(0.0588)
Ethylbenzene	ND(0.0588)
MTBE	ND(0.0588)
Isopropylbenzene	ND(0.0588)
Naphthalene	ND(0.118)
1,2,4-Trimethylbenzene	0.267
1,3,5-Trimethylbenzene	0.106
Xylenes (total)	ND(0.176)

Sample ID	24-SB4
Date	8/16/24
Depth (ft)	14.5-15'
Benzene	ND(0.0634)
Toluene	ND(0.0634)
Ethylbenzene	ND(0.0634)
MTBE	ND(0.0634)
Isopropylbenzene	ND(0.0634)
Naphthalene	ND(0.127)
1,2,4-Trimethylbenzene	0.966
1,3,5-Trimethylbenzene	ND(0.0634)
Xylenes (total)	ND(0.190)

Sample ID	24-SB5
Date	8/16/24
Depth (ft)	15.5-16'
Benzene	ND(0.0758)
Toluene	0.0891
Ethylbenzene	ND(0.0758)
MTBE	ND(0.0758)
Isopropylbenzene	ND(0.0758)
Naphthalene	ND(0.152)
1,2,4-Trimethylbenzene	ND(0.0758)
1,3,5-Trimethylbenzene	ND(0.0758)
Xylenes (total)	ND(0.227)

LEGEND

- Monitoring Well Location
- Soil Sample Location (8/16/24)
- Soil Sample Location (11/5/24)

PADEP ACT 2 NON-RESIDENTIAL STATEWIDE HEALTH STANDARD - DIRECT CONTACT (mg/kg)

Benzene	330
Toluene	10,000
Ethylbenzene	1,000
Xylenes (total)	9,100
MTBE	9,800
Isopropylbenzene	10,000
Naphthalene	77
1,2,4-Trimethylbenzene	5,400
1,3,5-Trimethylbenzene	5,400

PADEP ACT 2 NON-RESIDENTIAL STATEWIDE HEALTH STANDARD - SOIL TO GROUNDWATER - RESIDENTIAL USED AQUIFER (mg/kg)

Benzene	0.5
Toluene	100
Ethylbenzene	70
Xylenes (total)	1,000
MTBE	2
Isopropylbenzene	2,500
Naphthalene	25
1,2,4-Trimethylbenzene	300
1,3,5-Trimethylbenzene	93

Notes: -Site features and well locations obtained from "Figure 3 Site Plan", prepared by AECOM, dated September 2022
-Excavation corresponds to location of April 2023 soil samples SD-4/B-4

0 15 30
MAP SCALE

Synergy Environmental Inc.
Environmental Consultants
155 Railroad Plaza
First Floor
Royersford, PA 19468
P: 484-369-5000
F: 484-369-2000
W: www.synergyenvinc.com

FIGURE 4
August and November 2024 Soil Sampling Locations and Results
2899 Holme Avenue
Philadelphia, Pennsylvania

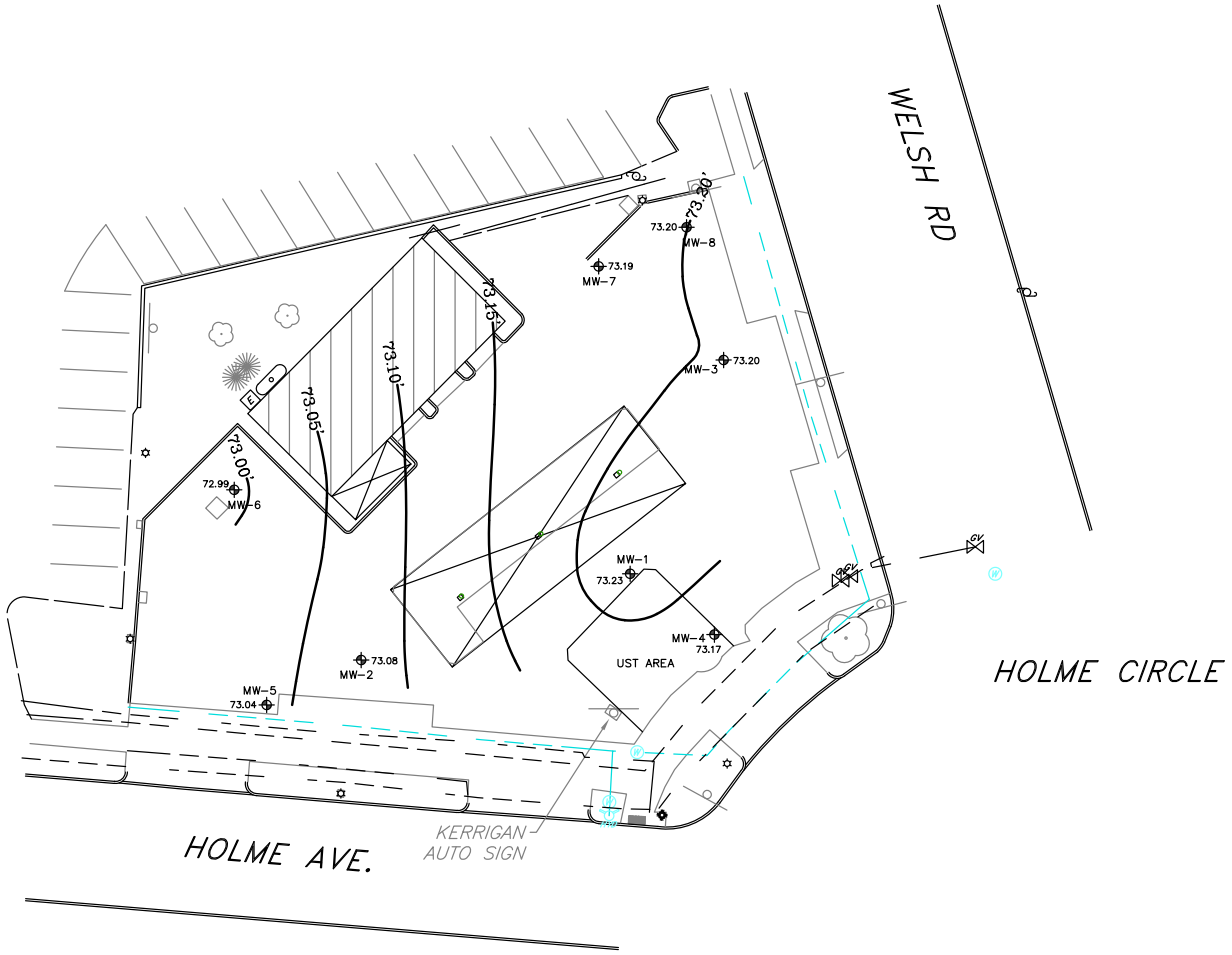
Drawn By:	Checked By:	Approved By:
EDF	RMH	RMH

Scale:	Dwg No:	Sheet:	Date:
1" = 30'	SE Gatz	Soil	5-29-25

Synergy Project No.: 24-01483

Rev. Desc.:

File Path: G:\PDrive NonLG (A-J)\Gatz Auto\J - Drawings Figures\Gatz - Fig 4 - Soil Results Aug-Nov 2024.pdf



LEGEND

⌖	MONITORING WELL
73.15'	GROUNDWATER CONTOUR LINE
73.08	GROUNDWATER ELEVATION (Based on NAVD 1988)
NS	NOT SAMPLED

Notes: – Site features and well locations obtained from survey performed by Bursich Associates, dated December 2024.

0 15 30
MAP SCALE

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Royersford, PA 19468
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W: www.synergyenvinc.com

FIGURE 5
Groundwater Contour Map: 3-13-25
2899 Holme Avenue
Philadelphia, Pennsylvania

Drawn By: EDF	Checked By: RMH	Approved By: RMH	
Scale: 1" = 30'	Dwg No: SE Gatz	Sheet: gwC 3-13-25	Date: 4-11-25
Synergy Project No.: 24-01483			
Rev. Desc.:			
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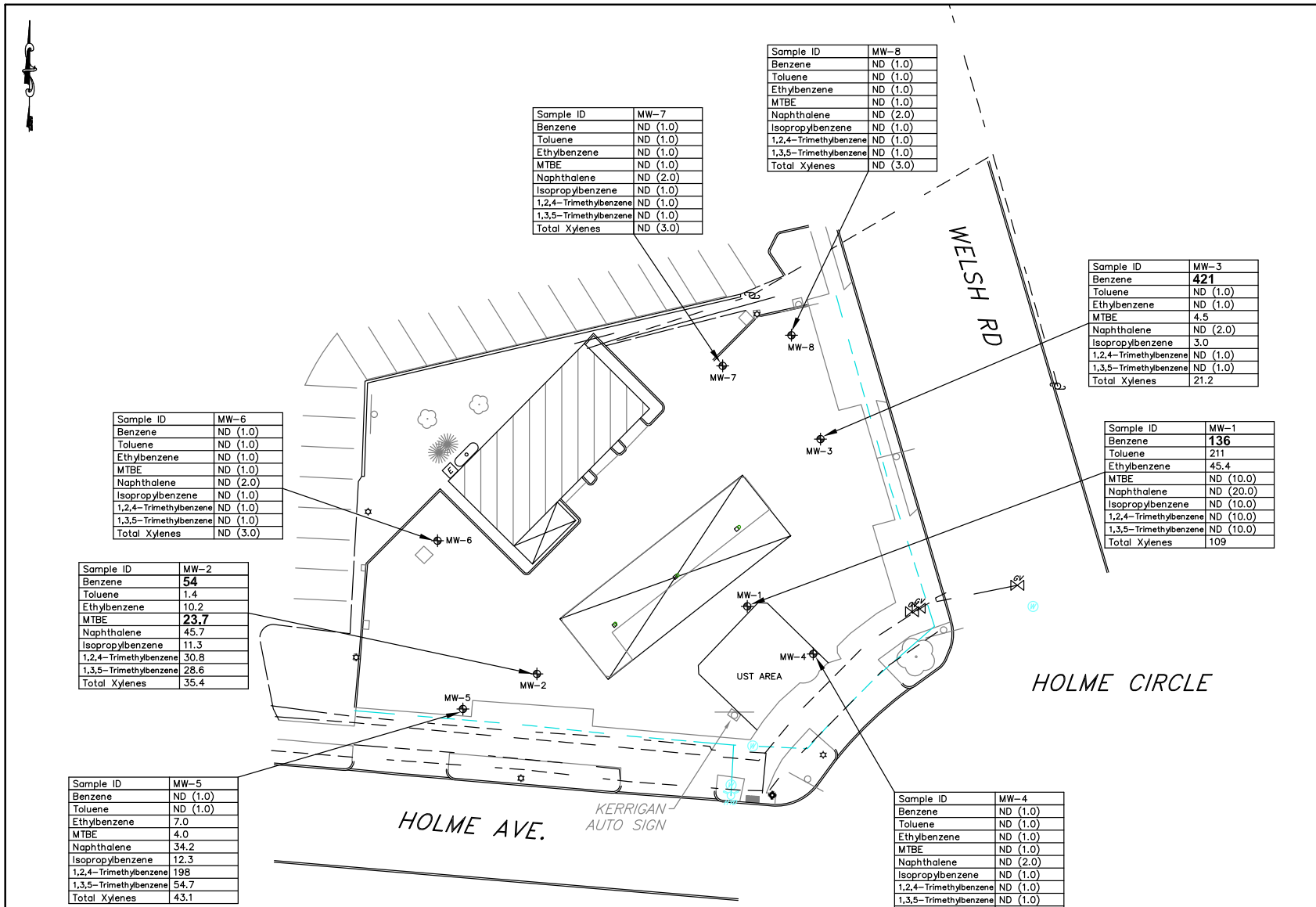

Sample ID	MW-8
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	ND (1.0)
Naphthalene	ND (2.0)
Isopropylbenzene	ND (1.0)
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	ND (3.0)

Sample ID	MW-7
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	ND (1.0)
Naphthalene	ND (2.0)
Isopropylbenzene	ND (1.0)
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	ND (3.0)

Sample ID	MW-3
Benzene	**421**
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	4.5
Naphthalene	ND (2.0)
Isopropylbenzene	3.0
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	21.2

Sample ID	MW-6
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	ND (1.0)
Naphthalene	ND (2.0)
Isopropylbenzene	ND (1.0)
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	ND (3.0)

Sample ID	MW-1
Benzene	**136**
Toluene	211
Ethylbenzene	45.4
MTBE	ND (10.0)
Naphthalene	ND (20.0)
Isopropylbenzene	ND (10.0)
1,2,4-Trimethylbenzene	ND (10.0)
1,3,5-Trimethylbenzene	ND (10.0)
Total Xylenes	109

Sample ID	MW-2
Benzene	**54**
Toluene	1.4
Ethylbenzene	10.2
MTBE	**23.7**
Naphthalene	45.7
Isopropylbenzene	11.3
1,2,4-Trimethylbenzene	30.8
1,3,5-Trimethylbenzene	28.6
Total Xylenes	35.4

Sample ID	MW-5
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	7.0
MTBE	4.0
Naphthalene	34.2
Isopropylbenzene	12.3
1,2,4-Trimethylbenzene	198
1,3,5-Trimethylbenzene	54.7
Total Xylenes	43.1

Sample ID	MW-4
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	ND (1.0)
Naphthalene	ND (2.0)
Isopropylbenzene	ND (1.0)
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	ND (3.0)

LEGEND

⌖	Monitoring Well Location
MTBE	Methyl Tert Butyl Ether
ND(1.0)	Not Detected At Or Above Detection Limit
NS	Well Not Sampled

PADEP ACT 2 RESIDENTIAL STATEWIDE HEALTH STANDARD – GROUNDWATER – NON-RESIDENTIAL USED AQUIFER (µg/L)

Benzene	5.0
Toluene	1,000
Ethylbenzene	700
Xylenes (total)	10,000
MTBE	20
Isopropylbenzene	840
Naphthalene	100
1,2,4-Trimethylbenzene	530
1,3,5-Trimethylbenzene	530

Notes: – Site features and well locations obtained from survey performed by Bursich Associates, dated December 2024.
– All results reported in micrograms per liter
– **BOLD** values indicate exceedance of PADEP Act 2 statewide health standards

0 15 30
MAP SCALE

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FIGURE 6
Groundwater Analytical Map: 3-13-25
2899 Holme Avenue
Philadelphia, Pennsylvania

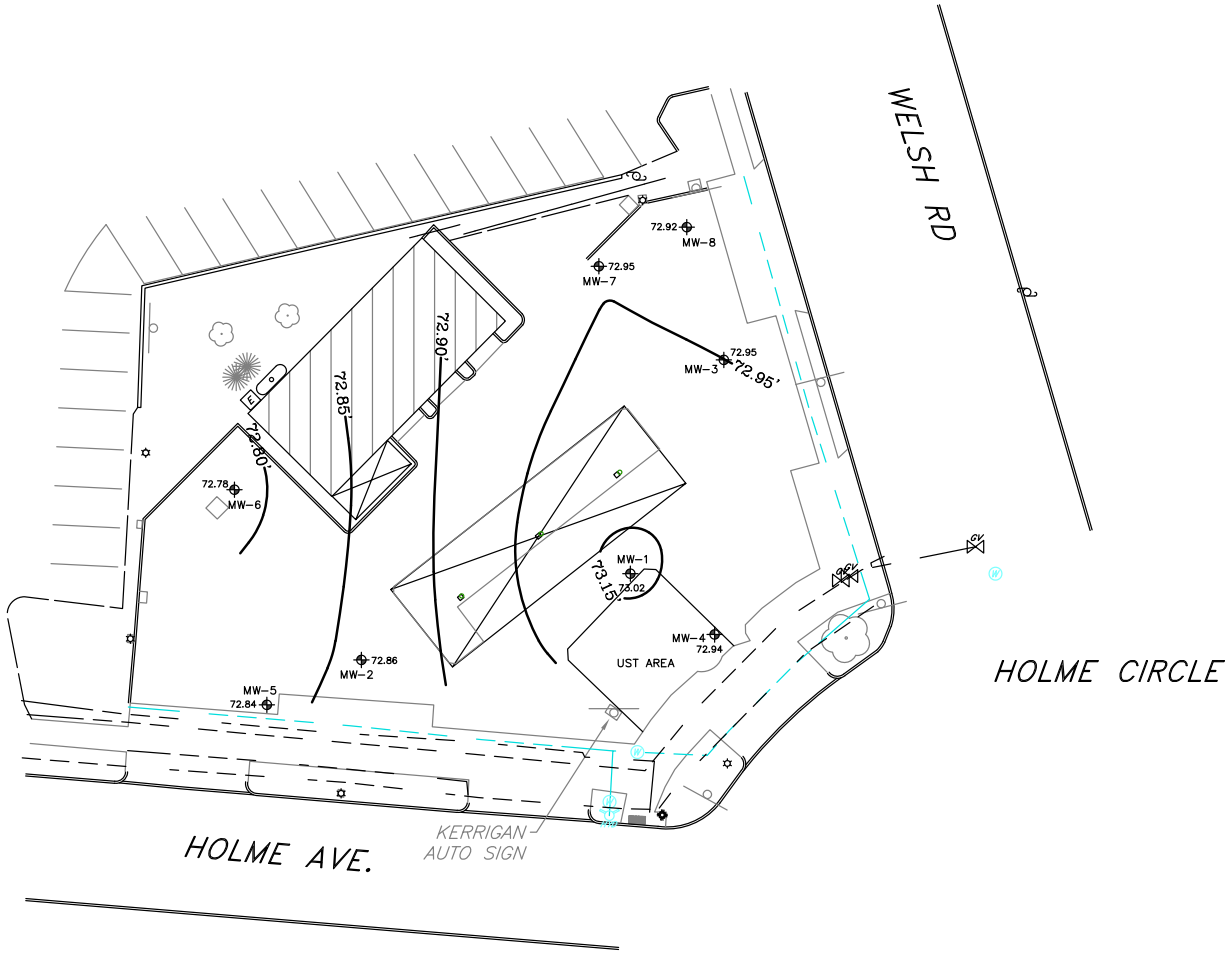
Drawn By:	Checked By:	Approved By:
EDF	RMH	RMH

Scale:	Dwg No:	Sheet:	Date:
1" = 30'	SE Gatz	gwQ 3-13-25	4-11-25

Synergy Project No.: 24-01483

Rev. Desc.:

File Path: G:\PDrive NonLG (A-J)\Gatz Auto\J - Drawings Figures\Gatz - Fig 6 - 2025 gwQ 3-13.pdf



LEGEND

⌖	MONITORING WELL
72.85'	GROUNDWATER CONTOUR LINE
72.78	GROUNDWATER ELEVATION (Based on NAVD 1988)
NS	NOT SAMPLED

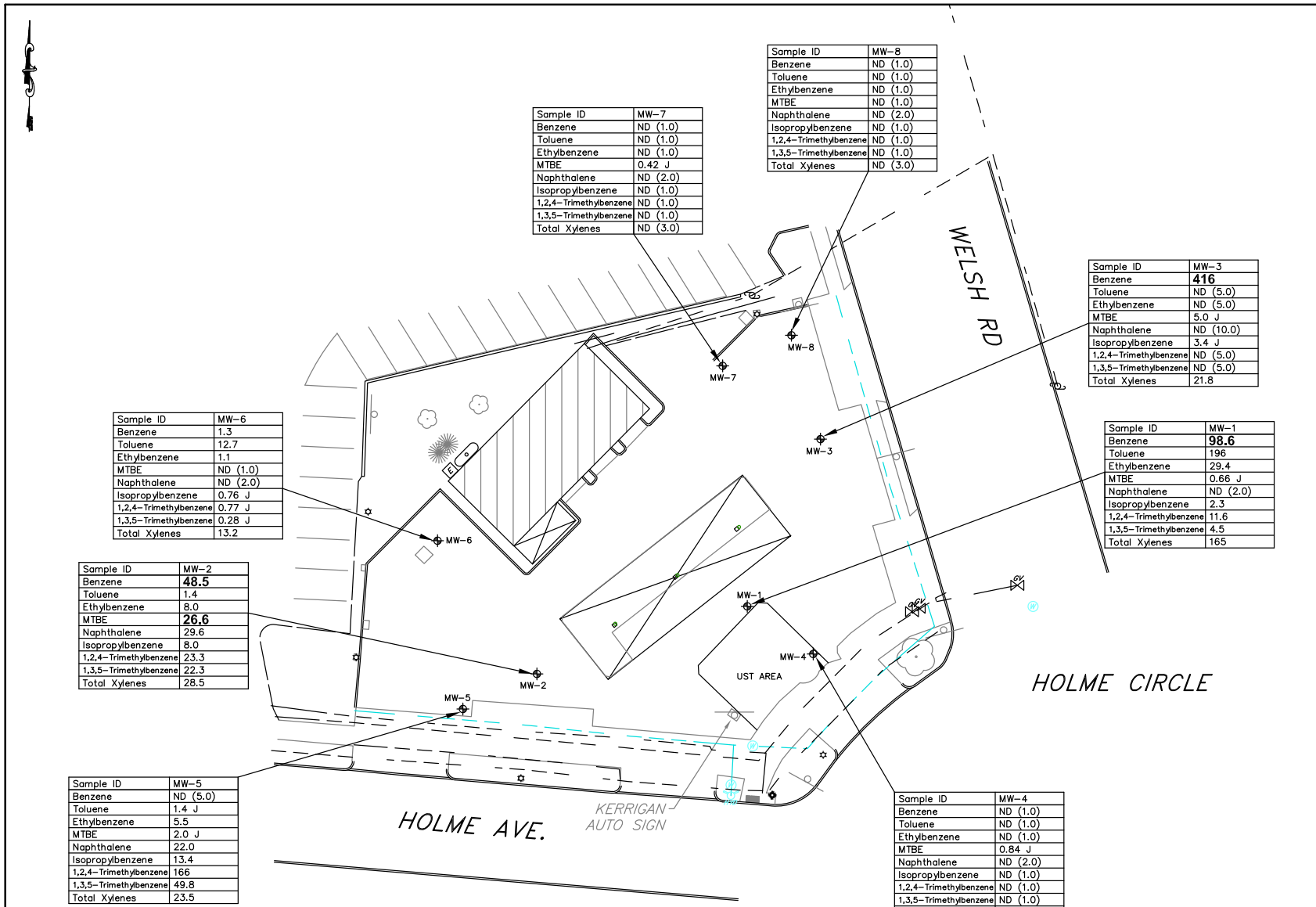
Notes: – Site features and well locations obtained from survey performed by Bursich Associates, dated December 2024.

0 15 30
MAP SCALE

Synergy Environmental Inc.
Environmental Consultants
155 Railroad Plaza
First Floor
Royersford, PA 19468
P: 484-369-5000
F: 484-369-2000
W: www.synergyenvinc.com

FIGURE 7
Groundwater Contour Map: 4-9-25
2899 Holme Avenue
Philadelphia, Pennsylvania

Drawn By: EDF	Checked By: RMH	Approved By: RMH	
Scale: 1" = 30'	Dwg No: SE Gatz	Sheet: gwC 2qrt25	Date: 5-20-25
Synergy Project No.: 24-01483			
Rev. Desc.:			
File Path: G:\PDrive NonLG (A-J)\Gatz Auto\J - Drawings Figures\Gatz - Fig 7 - 2025 gwC 2qrt.pdf			



Sample ID	MW-8
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	ND (1.0)
Naphthalene	ND (2.0)
Isopropylbenzene	ND (1.0)
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	ND (3.0)

Sample ID	MW-7
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	0.42 J
Naphthalene	ND (2.0)
Isopropylbenzene	ND (1.0)
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	ND (3.0)

Sample ID	MW-3
Benzene	**416**
Toluene	ND (5.0)
Ethylbenzene	ND (5.0)
MTBE	5.0 J
Naphthalene	ND (10.0)
Isopropylbenzene	3.4 J
1,2,4-Trimethylbenzene	ND (5.0)
1,3,5-Trimethylbenzene	ND (5.0)
Total Xylenes	21.8

Sample ID	MW-6
Benzene	1.3
Toluene	12.7
Ethylbenzene	1.1
MTBE	ND (1.0)
Naphthalene	ND (2.0)
Isopropylbenzene	0.76 J
1,2,4-Trimethylbenzene	0.77 J
1,3,5-Trimethylbenzene	0.28 J
Total Xylenes	13.2

Sample ID	MW-1
Benzene	**98.6**
Toluene	196
Ethylbenzene	29.4
MTBE	0.66 J
Naphthalene	ND (2.0)
Isopropylbenzene	2.3
1,2,4-Trimethylbenzene	11.6
1,3,5-Trimethylbenzene	4.5
Total Xylenes	165

Sample ID	MW-2
Benzene	**48.5**
Toluene	1.4
Ethylbenzene	8.0
MTBE	**26.6**
Naphthalene	29.6
Isopropylbenzene	8.0
1,2,4-Trimethylbenzene	23.3
1,3,5-Trimethylbenzene	22.3
Total Xylenes	28.5

Sample ID	MW-5
Benzene	ND (5.0)
Toluene	1.4 J
Ethylbenzene	5.5
MTBE	2.0 J
Naphthalene	22.0
Isopropylbenzene	13.4
1,2,4-Trimethylbenzene	166
1,3,5-Trimethylbenzene	49.8
Total Xylenes	23.5

Sample ID	MW-4
Benzene	ND (1.0)
Toluene	ND (1.0)
Ethylbenzene	ND (1.0)
MTBE	0.84 J
Naphthalene	ND (2.0)
Isopropylbenzene	ND (1.0)
1,2,4-Trimethylbenzene	ND (1.0)
1,3,5-Trimethylbenzene	ND (1.0)
Total Xylenes	ND (3.0)

LEGEND

⌖	Monitoring Well Location
MTBE	Methyl Tert Butyl Ether
ND(1.0)	Not Detected At Or Above Detection Limit
NS	Well Not Sampled

PADEP ACT 2 RESIDENTIAL STATEWIDE HEALTH STANDARD – GROUNDWATER – NON-RESIDENTIAL USED AQUIFER (µg/L)

Benzene	5.0
Toluene	1,000
Ethylbenzene	700
Xylenes (total)	10,000
MTBE	20
Isopropylbenzene	840
Naphthalene	100
1,2,4-Trimethylbenzene	530
1,3,5-Trimethylbenzene	530

Notes: – Site features and well locations obtained from survey performed by Bursich Associates, dated December 2024.
– All results reported in micrograms per liter
– **BOLD** values indicate exceedance of PADEP Act 2 statewide health standards

0 15 30
MAP SCALE

Synergy Environmental Inc.
Environmental Consultants
155 Railroad Plaza
First Floor
Royersford, PA 19468
P: 484-369-5000
F: 484-369-2000
W: www.synergyenvinc.com

FIGURE 8
Groundwater Analytical Results Map: 4-9-25
2899 Holme Avenue
Philadelphia, Pennsylvania

Drawn By:	Checked By:	Approved By:
EDF	RMH	RMH

Scale:	Dwg No:	Sheet:	Date:
1" = 30'	SE Gatz	gwQ 2qrt25	5-20-25

Synergy Project No.: 24-01483

Rev. Desc.:

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APPENDIX A

Notification of Reportable Release, January 27, 2024

NOTIFICATION OF RELEASE *(Owners and Operators)*

FACILITY I.D. NUMBER 51 - 30277

☒ Initial
☐ Follow-Up

NOTIFICATION OF CONTAMINATION *(Certified Installers and Inspectors)*

INFORMATION FOR OWNERS AND OPERATORS (O/O)

The Storage Tank Program's Corrective Action Process (CAP) regulations establish requirements for owners and operators of storage tank systems and storage tank facilities to report confirmed releases and, in certain cases, suspected releases.

Suspected Release Reporting: Upon the completion of a suspected release investigation from which it could not be determined whether a release has occurred, the owner or operator must, within 15 days of the indication of the suspected release, complete and submit this form to the appropriate regional office of the Department (Subsection 245.304(c)(2)).

Confirmed Release Reporting: The owner or operator must notify the appropriate regional office of the Department by telephone as soon as practicable, but no later than 24 hours, after the confirmation of a release (Subsections 245.305(a) and (b)). Within 15 days of that telephone notification, the owner or operator must complete and submit this form to the appropriate regional office of the Department, to each municipality in which the release occurred, and to each municipality where that release has impacted environmental media or water supplies, buildings, or sewer or other utility lines (Subsections 245.305(c) and (e)). And if new impacts to environmental media or water supplies, buildings, or sewer or other utility lines are discovered after that initial written notification, the owner or operator must, within 15 days of the discovery of the new impact, complete and submit this form to the Department and to each impacted municipality (Subsections 245.305(d) and (e)).

INFORMATION FOR CERTIFIED INSTALLERS AND INSPECTORS (I/I)

In accordance with the Storage Tank Program's certification regulations, certified installers and inspectors must complete and submit this form to the Department within 48 hours of observing any of the following while performing services as a certified installer or inspector: a release of a regulated substance; suspected or confirmed contamination of soil, surface or groundwater from regulated substances; or a regulated substance in a containment structure or facility (Subsections 245.132(a)(4) and 245.132(a)(6)).

INSTRUCTIONS

Record the storage tank facility I.D. number at the top right-hand corner of each page of this form.

Owners and Operators (O/O): Indicate if this is an initial or follow-up notification by marking the appropriate box found in the top right-hand corner of this page.

- To report a Suspected Release, complete all information in Sections I, II, IIIA, IIIC, VI, VIII and IX.
- To report a Confirmed Release, complete all information in Sections I, II, IIIA, IIIB, IIIC, IV, V, VIII and IX.

Certified Installers and Inspectors (I/I): Complete all information in Sections I, II, IIIA, IIIC, VI or VII, VIII, and IX. Attach a copy of the failed, valid tightness test results, if applicable.

PLEASE SEND COMPLETED ORIGINAL FORM TO:

PA Department of Environmental Protection
Environmental Cleanup and Brownfields Program
Storage Tank Section
(and the appropriate address below, depending on where the FACILITY is located)

Northwest Region	North-central Region	Northeast Region
230 Chestnut Street Meadville, PA 16335-3481 PHONE: 814-332-6945 / 800-373-3398 FAX: 814-332-6121	208 W. Third Street, Suite 101 Williamsport, PA 17701 PHONE: 570-327-3636 FAX: 570-327-3420	2 Public Square Wilkes-Barre, PA 18701-1915 PHONE: 570-826-2511 FAX: 570-820-4907
Counties: Armstrong, Butler, Clarion, Crawford, Elk, Erie, Forest, Indiana, Jefferson, Lawrence, McKean, Mercer, Venango, Warren	**Counties:** Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga, Union	**Counties:** Carbon, Lackawanna, Lehigh Luzerne, Monroe, Northampton, Pike Schuylkill, Susquehanna, Wayne, Wyoming
Southwest Region	**South-central Region**	**Southeast Region**
400 Waterfront Drive Pittsburgh, PA 15222 PHONE: 412-442-4000 FAX: 412-442-4194	909 Elmerton Avenue Harrisburg, PA 17110 PHONE: 717-705-4705 / 800-541-2050 FAX: 717-705-4830	2 East Main Street Norristown, PA 19401 PHONE: 484-250-5900 FAX: 484-250-5961
Counties: Allegheny, Beaver, Cambria, Fayette, Greene, Somerset, Washington, Westmoreland	**Counties:** Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry, York	**Counties:** Bucks, Chester, Delaware, Montgomery, Philadelphia

I. FACILITY INFORMATION (Both O/O and I/I)

Facility Name: GATZ AUTO
Facility I.D. Number: 51-30277
Street Address (P.O. Box not acceptable): 2899 HOLME AVENUE
City: PHILADELPHIA
State: PA
Zip Code: 19152 -
County: PHILADELPHIA
Municipality: PHILADELPHIA
Contact Person: JAMES KERRIGAN
Telephone Number: (267) 994 - 4466

II. OWNER/OPERATOR INFORMATION (Both O/O and I/I)

Owner Name: GATZ AUTO, INC.
Address: 2899 HOLME AVENUE
City: PHILADELPHIA
State: PA
Zip Code: 19152 -
Telephone Number: (267) 994 - 4466
Operator Name: JAMES KERRIGAN
Telephone Number: (267) 994 - 4466

III. REGULATED SUBSTANCE INFORMATION

A. Type of Product(s) Involved (Mark All That Apply ☒): Both O/O and I/I		B. Quantity (Gallons) of Product(s) Released: O/O Only	C. Contamination Suspected [S] or Confirmed [C] (Mark All That Apply ☒): Both O/O and I/I	
Leaded Gasoline	☐		☐ [S]	☐ [C]
Unleaded Gasoline	☒	UNKNOWN	☐ [S]	☒ [C]
Aviation Gasoline	☐		☐ [S]	☐ [C]
Kerosene	☐		☐ [S]	☐ [C]
Jet Fuel	☐		☐ [S]	☐ [C]
Diesel Fuel	☐		☐ [S]	☐ [C]
New Motor Oil	☐		☐ [S]	☐ [C]
Used Motor Oil	☐		☐ [S]	☐ [C]
Fuel Oil No. 1	☐		☐ [S]	☐ [C]
Fuel Oil No. 2	☐		☐ [S]	☐ [C]
Fuel Oil No. 4	☐		☐ [S]	☐ [C]
Fuel Oil No. 5	☐		☐ [S]	☐ [C]
Fuel Oil No. 6	☐		☐ [S]	☐ [C]
Other (Specify) _____	☐		☐ [S]	☐ [C]
Unknown	☐		☐ [S]	☐ [C]

IV. CONFIRMED RELEASE INFORMATION (O/O Only)

Date Release was Confirmed: 01 (m) / 25 (d) / 2024 (y)

Date Owner/Operator Verbally Notified Appropriate Regional Office of Confirmed Release and Office Notified:
Date: 01 (m) / 25 (d) / 2024 (y) Office: SOUTHEAST REGION

Date Owner/Operator Sent Copy of this Written Notification to Local Municipality(ies) and Name of Municipality(ies) Notified:
Date: 01 (m) / 26 (d) / 2024 (y) Municipality: PHILADELPHIA
Date: ____ (m) / ____ (d) / ____ (y) Municipality: _____

Source (Mark All That Apply ☒):

- Tank (DEP Assigned Nos. 003) ☐
- Piping System (Aboveground Regulated) ☐
- Piping System (Underground Regulated) ☐
- Piping System (Non-Regulated) ☐
- Dispenser/Dispensing Equipment ☐
- Spill Prevention Equipment ☐
- Submersible Turbine Pump Head/Fittings ☐
- Containment/Sump Failure ☐
- Other (Specify) CRACK IN FG TANK ☒
- Unknown ☐

Cause (Mark All That Apply ☒):

- Faulty Installation ☐
- Corrosion ☐
- Physical/Mechanical Failure ☒
- Spill During Delivery ☐
- Overfill at Delivery ☐
- Vehicle Gas Tank Overfill ☐
- Product Delivery Hose Rupture ☐
- Accident/Natural Disaster ☐
- Other (Specify) _____ ☐
- Unknown ☐

How Discovered (Mark All That Apply ☒):

- During Closure ☒
- Lining Installation ☐
- Routine Leak Detection ☐
- Third Party Inspection ☐
- Tightness Testing Activities ☐
- Visible Product or Odor Reports ☐
- Water in Tank ☐
- Construction ☐
- Upgrade/Repair ☐
- Supply Well Sample Results ☐
- Monitoring Well Sample Results ☐
- Property Transfer ☐
- Other (Specify) _____ ☐
- Unknown ☐

Environmental Media Affected and Impacts (Mark All That Apply ☒):

- Soil ☒
- Sediment ☐
- Surface Water ☐
- Ground Water ☐
- Bedrock ☐
- Water Supplies ☐
- Vapors/Product in Buildings ☐
- Vapors/Product in Sewer/Utility Lines ☐
- Ecological Receptors ☐

V. INTERIM REMEDIAL ACTIONS (O/O Only)

Indicate the Interim Remedial Actions Planned, Initiated or Completed (Mark All That Apply ☒):

	Planned	Initiated	Completed	Not Applicable
Regulated Substance Removed from Storage Tanks	☐	☐	☒	☐
Fire, Explosion and Safety Hazards Mitigated	☐	☐	☐	☒
Contaminated Soil Excavated	☐	☒	☐	☐
Free Product Recovered	☐	☐	☐	☒
Water Supplies Identified and Sampled	☐	☐	☐	☒
Temporary Water Supplies Provided	☐	☐	☐	☒
Other (Specify) _____	☐	☐	☐	☐

VI. SUSPECTED RELEASE / CONTAMINATION INFORMATION (Both O/O and I/I)

Date the Indication of a Suspected Release / Contamination was Observed: ___ / ___ / _____ (m / d / y)

Indication of Suspected Release / Contamination (Mark All That Apply ☒):

- ☐ Unusual Level of Vapors
- ☐ Erratic Behavior of Product Dispensing Equipment
- ☐ Release Detection Results Indicate a Release
- ☐ Discovery of Holes in the Storage Tank
- ☐ Containment Sump Test Failure
- ☐ Spill Prevention Equipment Test Failure
- ☐ Other (Specify) _____

VII. CONFIRMED CONTAMINATION INFORMATION (I/I Only)

Date the Confirmed Contamination was Observed: 01 / 25 / 2024 (m / d / y)

Extent of Confirmed Contamination (Mark All That Apply ☒):

- ☒ Product Stained or Product Saturated Soil or Backfill
- ☐ Ponded Product
- ☐ Free Product or Sheen on Ponded Water
- ☐ Free Product or Sheen on the Ground Water Surface
- ☐ Free Product or Sheen on Surface Water
- ☐ Other (Specify) CRACK IN TANK

VIII. ADDITIONAL INFORMATION (Both O/O and I/I)

Provide any additional, relevant, available information concerning the release or contamination. If reporting a confirmed release, include specific details about the source and cause of the release, the affected environmental media, and any impacts to water supplies, buildings, or sewer or other utility lines. Owners or Operators reporting a suspected release should describe what procedures were followed to investigate the indication(s) of the suspected release noted in Section VI. Provide both DEP-assigned and owner/operator-assigned tank number(s), where applicable. Use additional 8½" x 11" sheets of paper, if necessary.

DURING THE REMOVAL FOR PERMANENT CLOSURE OF UST 003, A CIRCUMFERENTIAL CRACK WAS IDENTIFIED ALONG THE BOTTOM OF THE NORTH END OF THE SINGLE-WALL FIBERGLASS TANK. OBVIOUS GASOLINE-IMPACTED SOIL WAS ALSO OBSERVED (PID FIELD-SCREENING) BENEATH THE NORTH END OF UST 003. NO IMPACTS TO WATER SUPPLIES, BUILDINGS OR UNDERGROUND UTILITIES WERE IDENTIFIED DURING THE CLOSURE ASSESSMENT.

IX. CERTIFICATION (Both O/O and I/I)

OWNER OR OPERATOR CERTIFICATION

I, JAMES KERRIGAN, hereby certify, under penalty of law as provided in 18 Pa.
(Print Name)

C.S.A. §4904 (relating to unsworn falsification to authorities) that I am the owner or operator of the above referenced storage tank facility and that the information provided by me in this notification is true, accurate and complete to the best of my knowledge and belief.

James P Kerrigan
Signature of Owner or Operator

1/26/24
Date

CERTIFIED INSTALLER CERTIFICATION

I, Timothy Fischer, hereby certify, under penalty of law as provided in 18 Pa.
(Print Name)

C.S.A. §4904 (relating to unsworn falsification to authorities) that I am the certified installer who performed tank handling activities at the above referenced storage tank facility and that the information provided by me in this notification is true, accurate and complete to the best of my knowledge and belief.

Timothy Fischer
Signature of Certified Installer

1/26/2024
Date

5197
Installer Certification Number

249
Company Certification Number

CERTIFIED INSPECTOR CERTIFICATION

I, _____, hereby certify, under penalty of law as provided in 18 Pa.
(Print Name)

C.S.A. §4904 (relating to unsworn falsification to authorities) that I am the certified inspector who performed inspection activities at the above referenced storage tank facility and that the information provided by me in this notification is true, accurate and complete to the best of my knowledge and belief.

_____
Signature of Certified Inspector

/ /
Date

_____
Inspector Certification Number

_____
Company Certification Number

APPENDIX B

Remedial Feasibility Study, Mulry and Cresswell, 2000

MULRY AND CRESSWELL ENVIRONMENTAL, INC.

11 August 2000

RECEIVED
DEP-SERO
ECP/WASTE MGM'T.
2000 OCT 12 PM 3:19

Mr. Bruce McClain
Hydrogeologist
Underground Storage Tank Program
PADEP - Southeast Regional Office
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19248

Re.: Re.: Remedial Feasibility Study
Sunoco Service Station
2899 Holme Avenue, Philadelphia, PA
Duns No. 0005-1078
Fac. ID No. 51-30277

Dear Mr. McClain,

At the request of Mr. Bradford L. Fish of Sunoco Inc. (R & M) (SUN), enclosed please find one copy of the Remedial Feasibility Study generated for the above referenced facility. The report contains a narrative of the methodology and results of a groundwater pumping test and soil vapor extraction test performed on 16 May 2000. Based on the results of these tests and recent groundwater quality data, Mulry and Cresswell Environmental Inc. (MCE), on behalf of SUN will prepare a Remedial Action Plan (RAP) in August 2000.

Please do not hesitate to call me if you have any questions or comments pertaining to the report.

Best regards,

John M. Zatyczyc, P.G.
Geologist

enclosure
cc: Mr. Bradford L. Fish, Sunoco, Inc. (R & M)
Sun Central Filing
MCE file

1691 Horseshoe Pike • Manor Professional Building • Suite 1 • Glenmoore, PA 19343 • Tel: (610) 942-9010 • Fax: (610) 942-9039
2 Kenley Court • Bear, DE 19701 • Tel: (302) 834-5310 • Fax: (302) 834-1616

MULRY AND CRESSWELL ENVIRONMENTAL, INC.

RECEIVED
DEP-SERO
ECP/WASTE MGMT.
2000 OCT 12 PM 3:19

REMEDIAL FEASIBILITY STUDY

GROUNDWATER PUMPING AND SOIL VAPOR EXTRACTION TEST

SUNOCO SERVICE STATION (0005-1078)
FACILITY ID # 51-30277
2899 HOLME AVENUE
PHILADELPHIA, PA

11 AUGUST 2000

PREPARED FOR:

MR. BRADFORD L. FISH, P.G.
HYDROGEOLOGIST
SUNOCO, INC. (R & M)
TWIN OAKS TERMINAL
4041 MARKET STREET
ASTON PA 19014-3197

PREPARED BY:

JOHN M. ZATYCZYC, P.G. # PG-002388-G
GEOLOGIST

(_____)

REVIEWED BY:

MARCO DROESE P.G. # 3738-E
SENIOR HYDROGEOLOGIST

(_____)

1691 Horseshoe Pike • Manor Professional Building • Suite 1 • Glenmoore, PA 19343 • Tel: (610) 942-9010 • Fax: (610) 942-9039
2 Kenley Court • Bear, DE 19701 • Tel: (302) 834-5310 • Fax: (302) 834-1616

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I INTRODUCTION:

At the request of Mr. Bradford L. Fish, of Sunoco, Inc. (R & M), (SUN), Mulry and Cresswell Environmental, Inc. (MCE) conducted a groundwater pumping and soil vapor extraction test at the Sunoco Service Station located at 2899 Holme Avenue Street, City of Philadelphia, Pennsylvania on 16 May 2000. This testing was performed to obtain hydrogeologic data and to determine the feasibility of groundwater pumping and soil vapor extraction as potential remedial techniques.

As depicted in Figures I and II, Site Location and Surrounding Properties, the site is located at the northwestern corner of Holme Circle between Holme Avenue and Welsh Road in the City of Philadelphia, Pennsylvania, in a mixed residential and commercial area. The subject location is a dealer owned Sunoco service station which performs automobile repairs. According to information obtained by SUN, three 8,000 gallon single walled fiberglass underground storage tanks (USTs), installed in 1982, are currently in use at this site.

On 16 May 2000, the groundwater pumping and soil vapor extraction tests were performed on OW 1, located on the western portion of the facility property. OW 1 has historically contained elevated concentrations of dissolved phase hydrocarbons. Methodology and results of the groundwater pumping and soil vapor extraction tests are discussed in Section III of this report.

A summary and discussion of the results and implications of the above cited tests is presented in Section IV of this report, presenting an evaluation of the feasibility of remedial options at this location.

II HISTORY:

At the request of Mr. Bradford L. Fish of SUN, Groundwater and Environmental Services, Inc. (GES) conducted an Environmental Assessment at the subject location during the month of May 1997 for divestment purposes.

The Environmental Assessment consisted of installing four groundwater observation wells (OWs 1 – 4), sampling and analyzing soil and groundwater from these wells, gauging liquid levels and calculating relative groundwater elevations in the wells. A PADEP well records search was conducted to identify the location of any existing well within 2,500 feet around the site. In addition, a regulatory agency file review and Vista multidatabase search were conducted. Four RCRA sites were identified within 1/8 miles radius of the site, the closest being Lee's Cleaners, located approximately 200 feet west of the site at 2855 Holme Avenue. In addition to the subject facility, one UST site was identified within ¼ mile radius, the Holme Circle Texaco, located approximately 200 feet east of the Sunoco station at 2901 Holme Avenue.

Soil samples were collected from the drill cuttings of all four observation wells on 12 May 1997 and analyzed for BTEX and MTBE (EPA method 8020) and semi-volatiles (EPA method 8270). None of the analytes was reported above method detection/quantification limit for the samples retrieved from 28 – 30 feet below grade surface (bgs) from OW 1, from 28 – 30 feet bgs from OW 3 and from 28 – 30 feet bgs from OW 4. For the sample retrieved from 18 – 20 feet bgs from OW 2, none of the analytes was reported above method detection/quantification limit, with the exception of MTBE, reported at 160 µg/kg. This value is below the PADEP Statewide health standard for soil.

In addition to the analytes described above, groundwater samples were analyzed for semi volatiles by method SW 846 8270C and for total dissolved solids (TDS) by method 160.1 during the initial sampling event on 13 May 1997. None of the semi volatiles was reported above method detection/quantification limit for any of the four wells, with the exception of phenanthrene, reported at 12 µg/l for the groundwater sample from OW 2. The reported TDS concentrations were: 414 mg/l for OW 1; 309 mg/l for OW 2; 216 mg/l for OW 3; and 450 mg/l for OW 4.

At the request of Mr. Fish of SUN, GES initiated a quarterly groundwater monitoring program in October 1997. Mulry and Cresswell Environmental Inc., (MCE) assumed site responsibilities and continued the quarterly groundwater monitoring program at this location in February 2000.

III GROUNDWATER PUMPING AND SOIL VAPOR EXTRACTION TEST – 16 MAY 2000:

A. METHODOLOGY

On 16 May 2000, a groundwater pumping test and soil vapor extraction test was conducted on OW 1. Subsequent to measuring static water table elevations (Table IA) in all observation wells, a submersible pump was deployed into OW 1. The depth to liquid water was measured from the top of the casing, adjacent to a notch in the north side of the casing in each well using an ART model IS-100-E electronic interface sensing probe. The interface sensing probe can distinguish hydrocarbon from water, is calibrated in 0.01' increments, and is intrinsically safe. Prior to measuring depth to liquid and in between measurements in different wells, the sensor probe and several feet of the measuring tape were washed in a solution of tap water and detergent and rinsed with tap water.

It should be noted that the static depth to water in OW 1 prior to the deployment of the pump was approximately 36.86 feet below top of casing (BTOC). With the pump deployed and the vent extension pipe attached to the well head, static depth to water was measured at approximately 38.42 feet from a fixed point on the vent pipe extension. Depth to water and drawdown data have been

corrected in the tables following in this report to compensate for the addition of the vent extension pipe.

The pumping rate was set to allow for sufficient drawdown in the pumping well without drawing the water level below the level of the top of the pump which was set at approximately 42.00 feet BTOC and to increase the de-watered screened interval to maximize the effect of the soil vapor extraction. The total depth of OW 1 was gauged at 43.7 feet BTOC. The pump was set at approximately one foot above the bottom of the well and a pumping rate of approximately 0.33 to 0.43 gallons per minute (gpm) was established to create a maximum drawdown of approximately 2.21 feet below that of the static liquid level in the pumping well (Table IIA).

Initially, for the first 30 minutes of the test, the pumping rate was set at approximately 0.42 to 0.43 gpm. At 35 minutes, the flow rate was decreased to approximately 0.33 gpm. For the duration of the test, the flowrate remained relatively stable ranging between 0.33 to 0.39 gpm.

Liquid level gauging during the pump test indicated that at a flowrate of between 0.42 and 0.43 gpm during the first 30 minutes of the test, the depth to water in the pumping well decreased to approximately 38.64 feet BTOC, approximately 1.78 feet below static conditions. Due to the rapid decrease in the watertable elevation (approximately 0.05 per minute) and the limited water column (approximately 6.84 feet), after approximately 30 minutes of pumping, the flowrate was decreased to approximately 0.33 gpm. At this flowrate, which remained relatively stable for the remainder of the test, the liquid level in OW 1 decreased by approximately between 0.03 to 0.05 feet through 180 minutes of pumping.

At 210 minutes of pumping, with liquid level measurements taken at 30 minute intervals, the water level increased by approximately 0.36 feet from the previous reading at 180 minutes with the flowrate remaining stable. Subsequent readings again showed a decrease of approximately 0.24 feet between the 240 and 270 minute readings. After 300 minutes, (5 hours) of pumping, the liquid level decreased an additional 0.05 feet. This is approximately 2.17 feet below static conditions. At approximately 300 minutes, soil vapor extraction was activated on OW 1. Presumably due to the applied vacuum of approximately 39 inches of water gauge ("H_2O), the liquid level measured at 360 minutes (6 hours) had increased by approximately 0.14 feet from the previous reading. Subsequent readings at 420 minutes (7 hours), 450 minutes (7.5 hours) and 480 minutes (8 hours) showed a slightly decreasing water level in OW 1, ranging between 0.05 and 0.07 feet between each reading. The total pumping time accumulated to approximately 480 minutes (8 hours) with OW 1 under simultaneous soil vapor extraction and groundwater pumping conditions for approximately 120 minutes (2 hours). With no observed response to vacuum in OWs 2 and 3, located

approximately 110 feet from OW 1, and only limited vacuum response of between 0.04" and 0.06 " H_2O measured on OW 4, the vapor extraction test was terminated. A detailed description of the vapor extraction testing results is presented in Section E of this report.

Recovered groundwater was treated with two 55 gallon, 200 lb. liquid phase granular activated carbon (GAC) units prior to discharge to a sanitary sewer system via a cleanout, located along Holme Avenue approximately 60 feet from the pumping well OW 1, under temporary approval from the City of Philadelphia, Water Department. A copy of the approval letter is attached as Appendix A.

Liquid level gauging (Table II B) was conducted on the remaining on-site wells OWs 2, 3 and 4 during the pumping test and simultaneous soil vapor extraction and groundwater pumping test.

B. HYDROGEOLOGY

Static depth to water was measured in all wells (OWs 1, 2, 3 and 4) prior to initiating the pumping test on OW 1. As presented in Table IA, Water Table Elevations, on 16 May 2000 depth to water ranged from a maximum of 37.20 feet below the top of the well casing (BTOC) in OW 4 to a minimum of 35.50 feet BTOC in OW 3.

As depicted on the attached Figure IIIA, Water Table Elevation (WTE Static Conditions) for 16 May 2000, under static conditions, the general direction of groundwater flow was to the southwest at the eastern half of the site under a gradient of approximately 2 feet per 30 feet (0.067 or 6.7%); and to the northwest at the western half of the site under a gradient of approximately 1 foot per 35 feet (0.029 or 2.9%).

As illustrated in Figure IIIB, Water Table Elevation (WTE Pumping Conditions) for 16 May 2000, after approximately eight hours of pumping from OW 1 a cone of depression was created around OW 1, while the magnitude and direction of the groundwater gradient between OWs 2, 3 and 4 did not change from static conditions.

During the 8 hours of pumping, no measurable drawdown was recorded in the surrounding observation wells (OWs 2, 3 and 4). Rather, watertable elevation increased during the course of the day by maximums of 0.02 and 0.04 feet in OWs 2 and 3, respectively and by only 0.01 feet in OW 4 presumably representing natural fluctuation in water table elevations. The data selected to construct Figure IIIB were taken after 8 hours of pumping with a measured drawdown in the pumping well of approximately 2.21 feet BTOC.

C. PUMPING TEST

As presented on Table IIA, the pumping test on OW 1 was conducted for a total approximately 480 minutes (8 hours). During the 8 hours of the pumping test, water table elevations (WTE) in the pumping well OW 1 decreased to a maximum drawdown of approximately 2.21 feet after 480 minutes of pumping. This is illustrated by the drawdown (s) versus time (t) plot attached for OW 1 as Figure IV. Approximately 173 gallons of groundwater were removed during the test, at an average flow rate of approximately 0.36 gpm.

As presented in Table IIB, during the 480 minutes (8 hour) duration of the pump test, no drawdown was measured in the observation wells OWs 2, 3 and 4. OWs 2 and 3 are located approximately 110 feet from OW 1 and OW 4, is located approximately 65 feet from OW 1. Liquid level gauging of these wells commenced at approximately 20 minutes into the pump test. At 20 minutes elapsed time, an increase of 0.01 feet above the static level was measured in OWs 2 and 3 during the first 80 minutes of pumping with no change in WTE in OW 4.

Between 100 minutes and 480 minutes of pumping, the WTE increased to a maximum of 0.02 feet in OW 2, measured after 140 minutes of pumping and a maximum of 0.04 feet in OW 3, which was measured during the seventh hour (420 minutes) and eighth hour (480 minutes) of the test. With respect to OW 4, between the 100 and 480 minute time intervals, a increase of 0.01 feet above the static level was measured in OW 4. These small increases presumably represent background water table changes. The increase in WTE for these wells are denoted as positive values on Table IIB.

During the pump test an influent sample of the groundwater was collected and analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl tert-butyl ether (MTBE), Naphthalene, and Isopropylbenzene (Cumene) by method 8260A. As presented in Table III, the influent stream sample was reported as containing 6,706 µg/l BTEX, 100 µg/l MTBE, 140 µg/l Naphthalene, and 19 µg/l Cumene.

As required by the Philadelphia Water Department (PWD), an effluent stream sample was collected and analyzed for BTEX by EPA method 8021B and for oil and grease (O & G) by EPA method 1664. Both BTEX and O & G concentrations were reported at non-detectable (ND). Results of the influent and effluent sampling are presented in Table III. Laboratory analytical reports for the influent and effluent groundwater sampling are attached as Appendix B. The results of the effluent stream sample were reported to PWD on 8 June 2000.

D. AQUIFER PARAMETERS

The pump test data from the pumping well (OW 1) was evaluated using the Cooper & Jacob time-drawdown Method, Neuman's Method and the Theis Method corrected for an unconfined aquifer. The calculations for Transmissivity (T), and hydraulic conductivity (K) were calculated for OW 1, the pumping well based on time-drawdown and discharge-time data. The data and associated graphs are depicted in the attached Appendix C. Data from OWs 2, 3 and 4 were not evaluated as no drawdown was measured in these wells during the 480 minutes (8 hours) of pumping. Without drawdown data from those wells, a capture zone was not calculated.

The calculated transmissivity (T) and conductivity (Ks), for each method were:

Method	T (ft^2/min)	Ks (ft/min)
Cooper & Jacob (OW 1) (time-drawdown)	0.0145	0.000291
Neuman's method (OW 1)	0.0137	0.000274
Theis (OW 1), variable discharge rate	0.0153	0.000307
Theis & Jacob (OW 1) Recovery method	0.0104	0.000209
Average:	**0.0135**	**0.000270**

(aquifer thickness "b" assumed to be = 50 feet, where required)

In general, the T and Ks values were in relatively close agreement for the pumping well for all evaluation all methods employed. The average values for the aquifer parameters were calculated as:

Transmissivity T = 0.0135 ft^2/min;
Hydraulic Conductivity Ks = 0.000270 ft/min (0.39 ft/day)

Based upon the average "K" value of 0.000270 ft/min, average gradient "i" of 0.067 ft/ft and approximated porosity "n" of 40 % for clay, the flow velocity can be calculated as:

$V = Ki / n$

V = 0.0000452 ft/min, or approximately 24 feet per year.

E. GROUNDWATER PUMPING AND SOIL VAPOR EXTRACTION TEST

After approximately 300 minutes (5 hours) of pumping, the soil vapor extraction (SVE) line was connected to OW 1 and sealed with the submersible pump still deployed and pumping at a flow rate of between approximately 0.34 and 0.39 gallons per minute in OW 1. The regenerative blower, Rotron model DR 454, was started for the vacuum extraction. Extracted soil gas was treated via two (2) 55 gallon, 200 lb. vapor phase granular activated carbon (GAC) drums

prior to atmospheric discharge. Approval to conduct the SVE test was granted by the City of Philadelphia, Department of Health on 2 May 2000. A copy of the approval letter is attached as Appendix A. Soil gas influent concentrations were measured via a pet cock opening in the vapor line influent to the GAC units using a Gastechtor Portable Gas Alarm, Model No. 1314 SMPN photoionization detector (PID Gastech). A Tedlar™ air sampling bag was also filled via the sampling port with influent soil gas and submitted to the laboratory for analyses for C_2-C_{10} hydrocarbons as propane, BTEX and MTBE concentrations by method EPA 18 and 25 modified (laboratory analysis reports are attached as Appendix D). The filled tedlar bag was immediately placed on ice in a cooler and subsequently transported to MCE's office and transferred to a refrigerator, stored at 4^0 C, prior to submittal via lab courier under chain of custody to Lancaster Laboratories, Inc. for analysis.

At the start of the vapor extraction test, the main flow control valve was fully open. After approximately 5 minutes, with the valve approximately ¾ shut, a vacuum reading was obtained on the influent line with a Dwyer® Magnahelic vacuum (0" to 100" H_2O) gauge to determine vacuum in and flow rate from the SVE well OW 1, as well as for the calculation of hydrocarbon removal rates. Initially, the vacuum was recorded as 39" H_2O. After 15 minutes, vacuum was recorded again at 39" H_2O. Subsequent readings were taken at 30, 45, 60, 90 and 120 minutes. During each of the vacuum measurements, corresponding influent and effluent PID readings were measured with a Gastechtor Portable Gas Alarm, Model No. 1314 SMPN photoionization detector (PID Gastech) in order to determine the optimal vacuum extraction which would produce the maximum influent soil vapor extraction concentrations. With the initial vacuum set at 39" H_2O, the influent concentration was recorded at 160 ppm. During the 30 minute readings, the vacuum control valve was closed slightly in order to determine if an increase in vacuum would result in an increase in the soil vapor gas concentration. With a slight increase in vacuum to 43" H_2O, the influent soil gas concentration was reduced to 130 ppm. Subsequently, the vacuum was adjusted back to 39" H_2O and the influent soil gas concentration increased back to 160 ppm. For the remainder of the vacuum extraction, the vacuum remained stable at 39" H_2O and influent concentrations ranged between 150 and 160 ppm.

Effluent PID readings were also measured at regular time intervals. The effluent concentrations were initially measured at 0.0 ppm after 5 minutes. After 15 minutes, the effluent concentration increased to 90 ppm and fluctuated between 80 and 90 ppm for the duration of the test which was terminated after approximately 2 hours as the influent concentrations also remained relatively stable.

The flow rate was determined by measuring the time for a 30 gallon bag to be filled with air at the effluent stack. Based upon the field measurements, the bag was repeatedly filled in approximately four (4) seconds. Thirty (30) gallons is approximately equivalent to four (4) cubic feet (ft^3). Therefore the flowrate would be 1 ft^3 per second or sixty (60) ft^3 /minute (60 SCFM). These data are summarized in Table IV. The estimated hydrocarbon removal rate during the SVE test was approximately 0.12 lb/hr.

At approximately 90 minutes into the vacuum extraction test, a tedlar air bag sample was collected from the influent air stream and analyzed for BTEX, MTBE and $C_2 - C_{10}$ hydrocarbons.

The Tedlar air bag sample retrieved from the soil gas stream extracted from OW 1 on 16 May 2000 was reported as containing: 34 mg/m^3 BTEX, reported as <3 mg/m^3 benzene, <4 mg/m^3 toluene, <5 mg/m^3 ethylbenzene and 34 mg/m^3 total xylenes, 45 mg/m^3 MTBE and 400 mg/m^3 C_2-C_{10} hydrocarbons (as propane). A copy of the laboratory analytical report is attached as Appendix D. Based upon the corresponding soil gas flow rate of 60 scfm, a hydrocarbon removal rate of approximately 0.09 lb./hr C_2-C_{10}, approximately 0.0076 lb/hr BTEX, and approximately 0.01 lb/hr MTBE was achieved via soil vapor extraction with simultaneous groundwater pumping from OW 1. These estimated hydrocarbon removal rates are presented in Table V.

In addition to recording vacuum readings at the vacuum extraction well, OW 1, vacuum readings were also measured at the observation wells OWs 2, 3 and 4 at regular time intervals to determine the radius of influence, between wells across the site.

During the 2 hours of the vacuum extraction test, no vacuum response was recorded in OWs 2 and 3, which are located approximately 110 feet from OW 1. After approximately 30 minutes, a vacuum response of 0.04" H_2O was measured in OW 4, which is located approximately 65 feet from OW 1. The vacuum response remained stable at 0.04" H_2O or the first 60 minutes of the test, decreased to 0.02" H_2O at 90 minutes and subsequently increased to 0.06" H_2O at 120 minutes. These results are summarized in Table VI.

IV SUMMARY AND DISCUSSION:

Mulry and Cresswell Environmental, Inc. (MCE) conducted a groundwater pumping and soil vapor extraction test at the Sunoco Service Station located at 2899 Holme Avenue, Philadelphia, Pennsylvania in May 2000.

During the pumping test, approximately 173 gallons of groundwater were removed from OW 1 during the 480 minutes (8 hours) of the pump test, at an average flowrate of approximately 0.36 gpm.

A maximum drawdown of 2.21 feet was achieved in OW 1, the pumping well, during the eight hours of pumping. No drawdown responses were measured in the observation wells (OWs 2, 3 and 4) during the 8 hours of pumping. Average aquifer parameters were calculated as $T=0.0135\ ft^2/min$; $K_s=2.7x10^{-4}\ ft/min$.

For approximately 120 minutes of the pumping test, soil vapor extraction was conducted on OW 1 simultaneously with continued pumping at a rate of approximately 0.33 to 0.36 gpm. The soil vapor flow rate was calculated as approximately 60 scfm. PID readings on the extracted soil gas influent indicated hydrocarbon concentrations of approximately 150 to 160 ppm. A Tedlar bag soil gas sample retrieved from the extracted soil gas influent stream and submitted to the laboratory for analysis and was reported as containing: 34 mg/m^3 BTEX, reported as <3 mg/m^3 benzene, <4 mg/m^3 toluene, <5 mg/m^3 ethylbenzene and 34 mg/m^3 total xylenes, 45 mg/m^3 MTBE and 400 mg/m^3 C_2-C_{10} hydrocarbons (as propane).

Vacuum communication was measured at between 0.02 and 0.06 inches H_2O in OW 4, located approximately 65 feet to the northeast of the vapor extraction well, OW 1. No response to vacuum was measured in OWs 2 and 3, located approximately 110 feet east and northeast, respectively, of OW 1.

While the influence of pumping and soil vapor extraction on the subsurface appears to be spatially limited, groundwater quality data obtained during future quarterly sampling events will be evaluated to determine the need for and feasibility of either a stationary remediation system or periodic "hot spot" remediation efforts.

MULRY AND CRESSWELL
ENVIRONMENTAL, INC.

Table IA: Water Table Elevations (Static Conditions)
Sunoco Service Station (DUNS # 0005-1078)
2899 Holme Avenue, Philadelphia, PA

OW 1

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	36.86	98.81	61.95

OW 2

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	36.40	99.20	62.80

OW 3

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	35.50	100.00	64.50

OW 4

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	37.20	98.47	61.27

Table IB: Water Table Elevations (Pumping Conditions)
After 8 Hours of Pumping from OW 1
Sunoco Service Station (DUNS # 0005-1078)
2899 Holme Avenue, Philadelphia, PA

OW 1

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	39.07	98.81	59.74

OW 2

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	36.38	99.20	62.82

OW 3

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	35.46	100.00	64.54

OW 4

Date	Depth to Water	Casing Elevation	Water Table Elevation
16-May-00	37.20	98.47	61.27

Depth to water as measured for OW 1, the pumping well, is adjusted to account for vent pipe extension.

MULRY AND CRESSWELL
ENVIRONMENTAL, INC.

Table IIA: Pumping Test on OW 1 - Pumping Rates and Drawdown
Sunoco Service Station (0005-1078), 2899 Holme Avenue, Philadelphia, PA
(pumping time in minutes, flow rate in gpm, dtw in feet)

Clock Time	Pumping Time	gpm	DTW	*Drawdown	Comments
10:00	0	0	36.86	-	Static water level with pump deployed in well
	0.5		37.34	0.48	
	1		37.40	0.54	
	1.5		37.46	0.60	
	2		37.49	0.63	
	3		37.61	0.75	
	4		37.70	0.84	
	5		37.78	0.92	
	6	0.43	37.86	1.00	
	7		37.93	1.07	
	8		37.99	1.13	
	9		38.04	1.18	
	10	0.42	38.09	1.23	
	12		38.19	1.33	
	14		38.28	1.42	
	16		38.33	1.47	
	18	0.42	38.38	1.52	
	20		38.43	1.57	
	25		38.55	1.69	
	30	0.42	38.64	1.78	
	35		38.60	1.74	Decrease flowrate to 0.33 gpm
	40		38.59	1.73	
	45		38.57	1.71	
	50	0.34	38.58	1.72	
	55		38.59	1.73	
	60	0.34	38.60	1.74	
	70		38.61	1.75	
	80	0.33	38.64	1.78	
	90		38.66	1.80	
	100		38.69	1.83	
	120	0.33	38.71	1.85	
	140		38.76	1.90	
	160		38.79	1.93	
	180	0.34	38.82	1.96	
	210		38.46	1.60	
	240	0.38	38.74	1.88	
	270		38.98	2.12	
	300	0.36	39.03	2.17	Connected Well to SVE at 5 hrs.
	360		38.89	2.03	
	420	0.39	38.94	2.08	Shutdown vacuum extraction test after 2 hrs.
	450		39.01	2.15	
18:00	480	0.34	39.07	2.21	terminate test after 8 hours

DTW = Depth to Water
* Depth to water as presented above is calculated based upon measurements taken from the top of the well casing.

MULRY AND CRESSWELL
ENVIRONMENTAL, INC.

Table IIB: Drawdown Response in OWs 2, 3 and 4 to pumping from OW 1
Sunoco Service Station (DUNS # 0005-1078)
2899 Holme Avenue, Philadelphia, PA

Elapsed Time (min.)	OW 2-DTW	Drawdown OW 2	OW 3-DTW	Drawdown OW 3	OW 4-DTW	Drawdown OW 4
Static DTW (ft.)	36.40	-	35.50	-	37.20	-
20	36.39	0.01	35.49	0.01	37.20	0.00
25	-	-	-	-	-	-
30	-	-	-	-	-	-
35	-	-	-	-	-	-
40	36.39	0.01	35.49	0.01	37.20	0.00
45	-	-	-	-	-	-
50	-	-	-	-	-	-
55	-	-	-	-	-	-
60	36.39	0.01	35.49	0.01	37.20	0.00
70	-	-	-	-	-	-
80	36.39	0.01	35.49	0.01	37.20	0.00
90	-	-	-	-	-	-
100	36.39	0.01	35.48	0.02	37.20	0.00
120	36.39	0.01	35.48	0.02	37.20	0.00
140	36.38	0.02	35.48	0.02	37.19	0.01
160	36.40	0.00	35.48	0.02	37.19	0.01
180	36.39	0.01	35.48	0.02	37.19	0.01
210	36.39	0.01	35.48	0.02	37.19	0.01
240	36.39	0.01	35.48	0.02	37.19	0.01
270	36.38	0.02	35.48	0.02	37.19	0.01
300	36.38	0.02	35.47	0.03	37.19	0.01
360	36.38	0.02	35.48	0.02	37.20	0.00
420	36.38	0.02	35.46	0.04	37.19	0.01
480	36.38	0.02	35.46	0.04	37.20	0.00

Increases from the static water table elevations for OWs 2, 3 and 4 are denoted by the positive values.

MULRY AND CRESSWELL
ENVIRONMENTAL, INC.

Table III: Pump Test Effluent and Influent Results - Pumping Well OW 1
BTEX, MTBE, Naphthalene, Isopropylbenzene (Cumene) in ug/l, Oil & Grease (O&G) in mg/l
Sunoco Service Station (Duns # 0005-1078)
2899 Holme Avenue, Philadelphia, PA

Effluent OW 2

Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Naphthalene	Isopropylbenzene	Oil & Grease
16-May-00	BDL	BDL	BDL	BDL	BDL	-	-	-	BDL

Influent OW 2

Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Naphthalene	Isopropylbenzene	Oil & Grease
16-May-00	120	19	67	6500	6706	100	140	19	-

"-" = compound not analyzed
BDL = Below Method Detection Limit

Effluent samples were analyzed for BTEX by method 8021B and for oil and grease (O&G) by EPA method 1664

Influent samples were analyzed for BTEX, MTBE, Naphthalene and Isopropylbenzene by method 8260A.

MULRY AND CRESSWELL ENVIRONMENTAL, INC.

Table IV: Combined Vapor Extraction/Groundwater Pumping Test

Sunoco Service Station (0005-1078), 2899 Holme Avenue, Philadelphia, PA

Vapor Extraction Test on OW 1

16 May 2000

Rotron regenerative blower, Model DR 454

Pumping rate of the simultaneous groundwater pumping test fluctuated between approximately 0.43 - 0.33 gpm (for the entire test)

Influent air sample was collected at 16:50 for laboratory analysis

Estimated Hydrocarbon Removal Based on Gastech-measurements of Extracted Soil Vapor:

Elapsed Time (min)	Vacuum (Inches H_20)	SCFM	Influent ppm	estimated lb./hr
5	39	60	160	-
15	39	60	160	0.13
30	39	60	160	0.13
30	43	-	130	0.11
45	39	60	150	0.12
60	39	60	160	0.13
90	39	60	150	0.12
120	39	60	150	0.12

Conversion of Gastech field readings (ppm) to lb. hydrocarbons:

87g (avg. mol weight hydrocarbons)	"x" ppm reading	scfm	0.077 lb. (weight of air)	60 min
29g (avg. mol weight air)	1,000,000 air	min	cubic ft. (per volume of air)	1 hour

SCFM data calculated by measuring the time to fill a bag of known volume (30 gallons) with air.

MULRY AND CRESSWELL ENVIRONMENTAL, INC.

Table V: Estimated Hydrocarbon Removal Based on Laboratory Analytical Results for Extracted Soil Vapor:
Sunoco Service Station (0005-1078), 2899 Holme Avenue, Philadelphia, PA

For OW 1 influent sample, C_2- C_{10} Hydrocarbons, 16 May 2000, 16:50:

400 mg C_2-C_{10} Hydrocarbons	1 lb.	60 scf	60 min	0.028317 m^3	0.0899 lb. C_2-C_{10}
m^3	453,590 mg	min	hour	scf	hour

For OW 1 influent sample, total BTEX, 16 May 2000, 16:50:

34 total BTEX	1 lb.	60 scf	60 min	0.028317 m^3	0.0076 lb. total BTEX
m^3	453,590 mg	min	hour	scf	hour

For OW 1 influent sample, MTBE, 16 May 2000, 16:50:

45 mg MTBE	1 lb.	60 scf	60 min	0.028317 m^3	0.0101 lb. MTBE
m^3	453,590 mg	min	hour	scf	hour

Conversion of laboratory analytical results in mg/m^3 to lb./hour:

"x" mg C_2-C_{10} Hydrocarbons	1g x 1 lb.	scf	60 min	0.028317 m^3	= lb. C_2-C_{10} hydrocarbons
1 m^3 air	1000 mg x 453.59 g	min	hour	scf	hour

conversion for bag-airflow measurements to vacuum, scfm, m^3/min:
(x gal / x sec) x (60 sec / min) x (3.785 l / 1 US gal) x (1 m^3 / 1000 l)

Table VI: Vacuum Readings in Surrounding Observation Wells
Combined Vapor Extraction/Groundwater Pumping Test on OW 1
Sunoco Service Station (0005-1078) 2899 Holme Avenue, Philadelphia, PA

Elapsed Time (min)	OW 2	OW 3	OW 4
	"H_2O Vacuum	"H_2O Vacuum	"H_2O Vacuum
0	-	-	-
15	0.00	0.00	-
30	0.00	0.00	0.04
45	0.00	0.00	0.04
60	0.00	0.00	0.04
90	0.00	0.00	0.02
120	0.00	0.00	0.06

* 0" to 1" magnahelic gauge used to record vacuum response in observation wells.

OW 2 is located approximately 110 feet from OW 1.

OW 3 is located approximately 110 feet from OW 1.

OW 4 is located approximately 65 feet from OW 1.

MULRY AND CRESSWELL
ENVIRONMENTAL, INC.

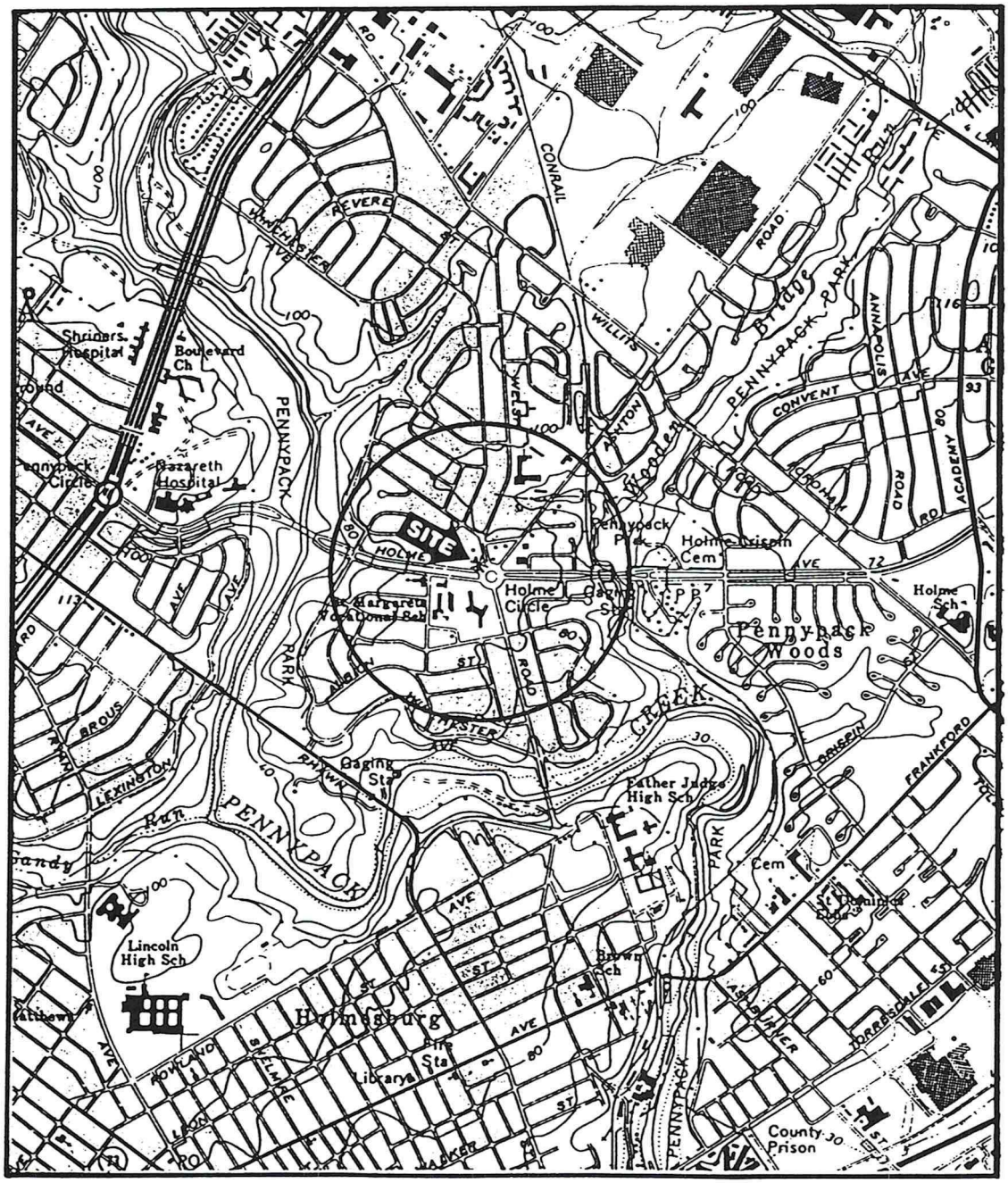


FIGURE I
SITE LOCATION
SUNOCO STATION
2899 HOLME AVENUE
PHILADELPHIA, PENNSYLVANIA

SCALE IN FEET
0 2000 4000

NORTH

SOURCE: USGS. FRANKFORD, PA
QUADRANGLE. 1967
PHOTOREVISED 1983

MULRY AND CRESSWELL ENVIRONMENTAL, INC.

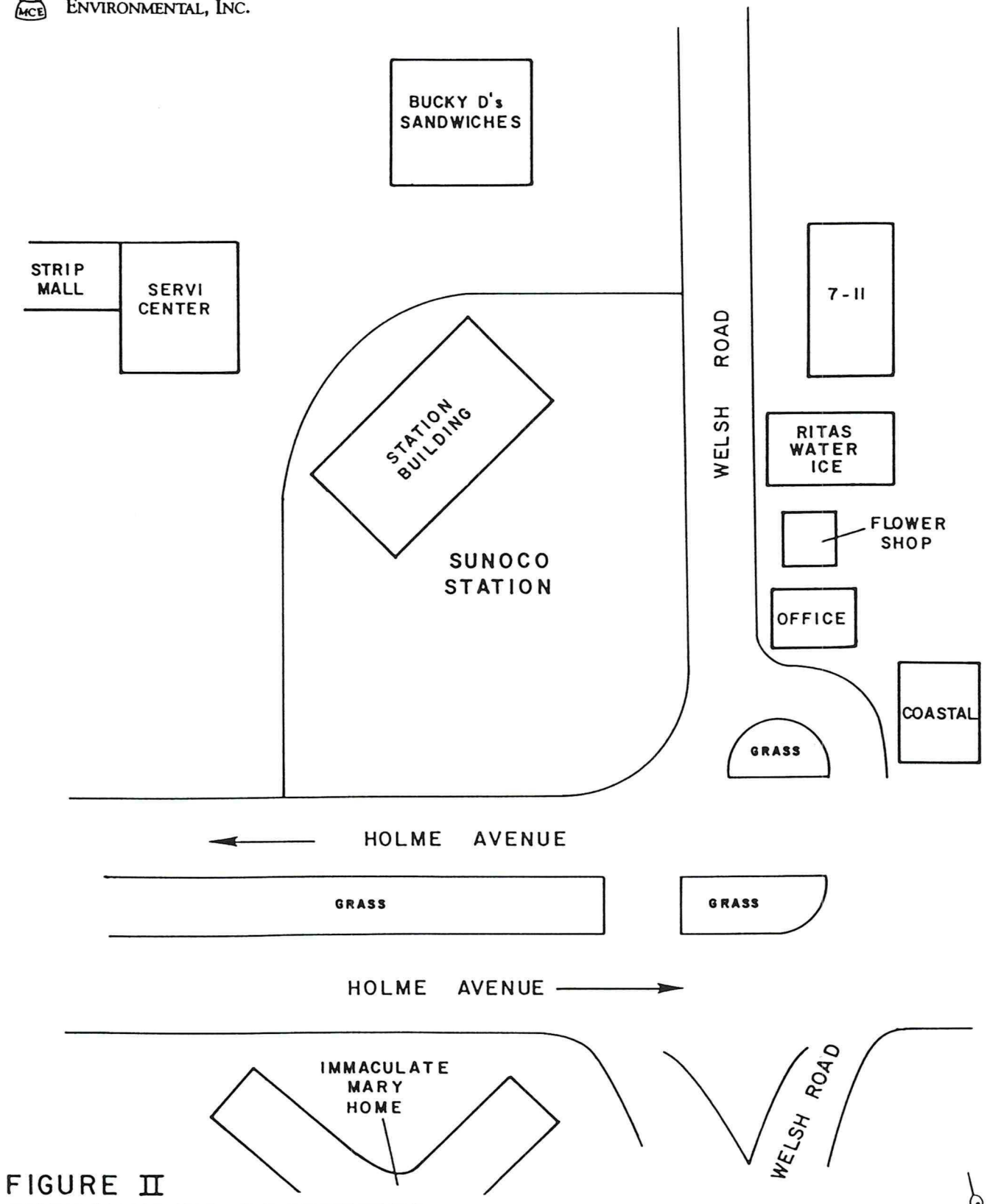
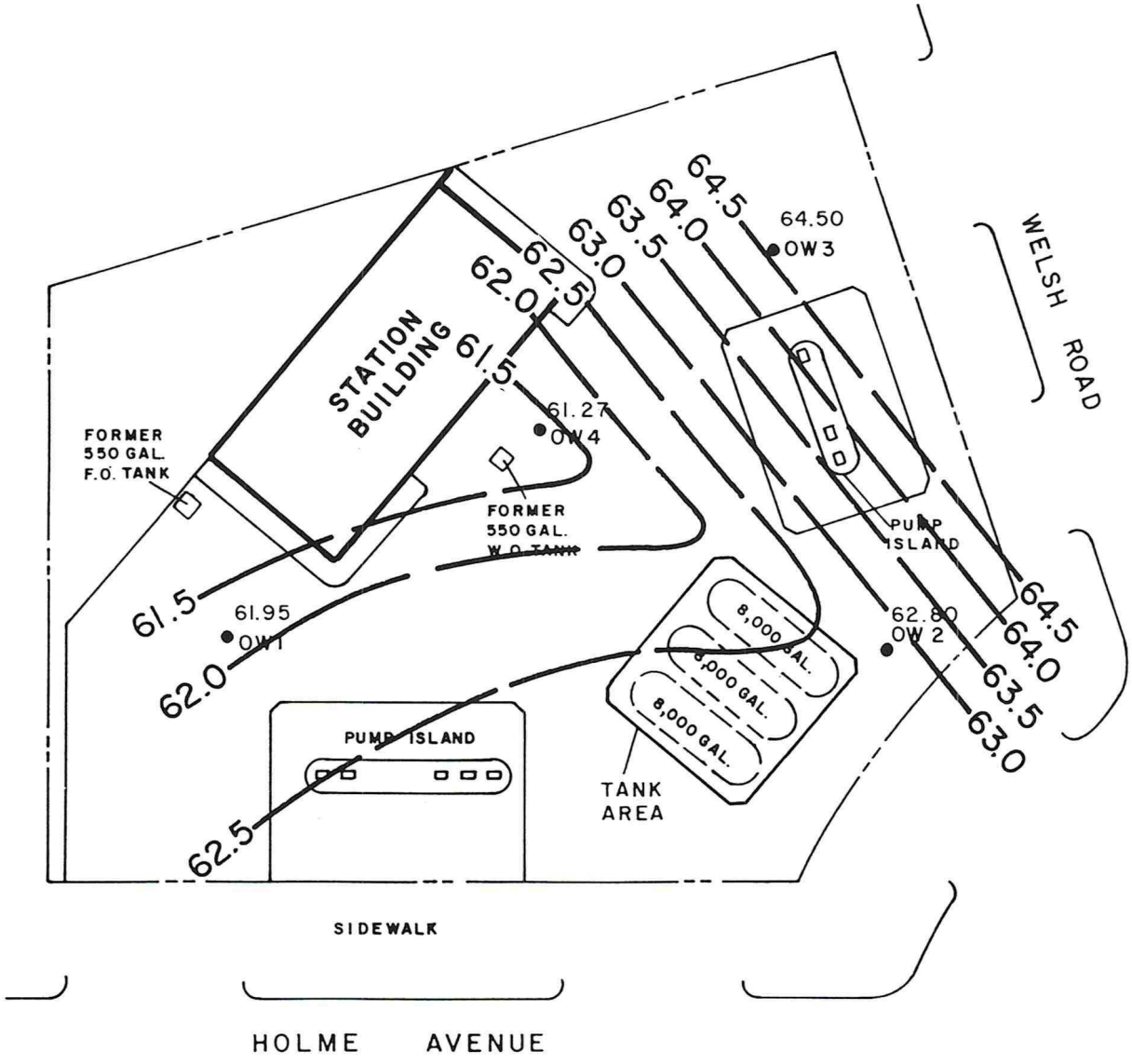


FIGURE II
SURROUNDING PROPERTIES
SUNOCO STATION
2899 HOLME AVENUE
PHILADELPHIA, PENNSYLVANIA

NOT TO SCALE

MULRY AND CRESSWELL
ENVIRONMENTAL, INC.



● OBSERVATION WELL

NORTH

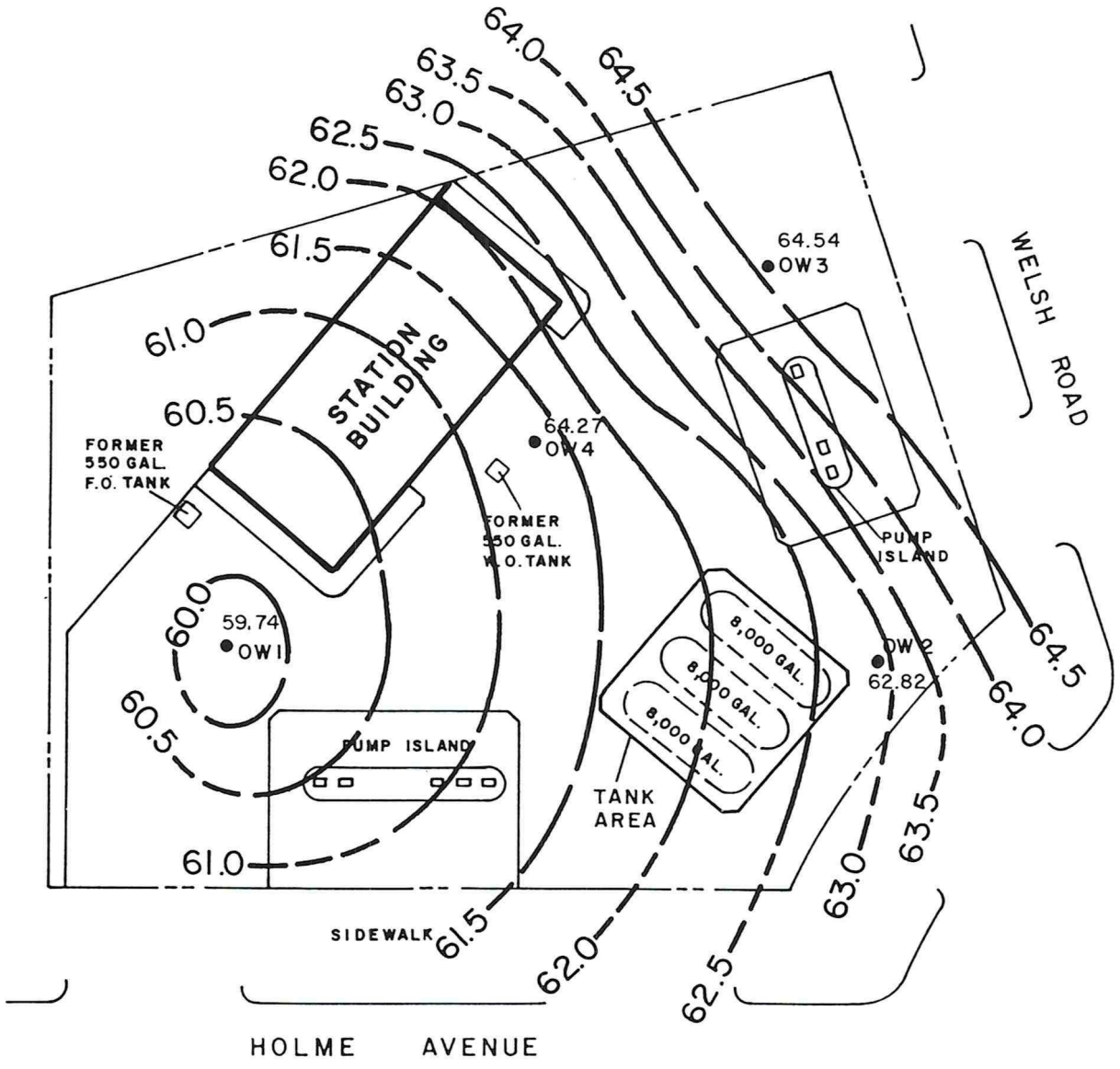
APPROXIMATE SCALE IN FEET

0 30

SOURCE: GES PLOT PLAN

FIGURE III A
WATER TABLE ELEVATION (FEET)
(STATIC CONDITIONS)
16 MAY 2000
SUNOCO STATION
2899 HOLME AVENUE
PHILADELPHIA, PENNSYLVANIA

MULRY AND CRESSWELL
ENVIRONMENTAL, INC.



● OBSERVATION WELL

NORTH

APPROXIMATE SCALE IN FEET

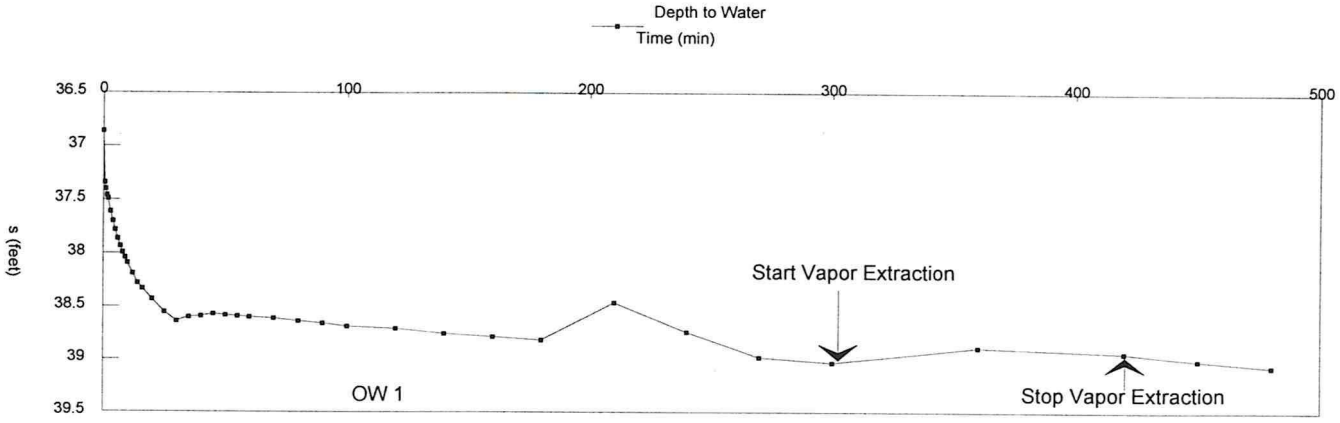
0 30

SOURCE: GES PLOT PLAN

FIGURE IIIB
WATER TABLE ELEVATION (FEET)
PUMPING CONDITIONS AFTER 8 HOURS
16 MAY 2000
SUNOCO STATION
2899 HOLME AVENUE
PHILADELPHIA, PENNSYLVANIA

Figure IV: Plots of "s" vs. "t" for the Pumping Well OW 1

Pumptest on OW 1 - 16 May 2000
Sunoco Service Station (0005-1078), 2899 Holme Avenue, Philadelphia, PA



APPENDIX A

COPIES OF LETTERS OF APPROVAL

CITY OF PHILADELPHIA

WATER DEPARTMENT
ARA Tower at Reading Center
1101 Market Street

KUMAR KISHINCHAND, P.E
WATER COMMISSIONER

May 2, 2000

Mr. John Zatyczyc
Mulrey & Cresswell Environmental, Inc
1691 Horseshoe Pike
Manor Professional Bldg. Suite 1
Glenmore, PA 19343

Re: **Sunoco Station**
2899 Holme Ave.

Dear John Zatyczyc:

The Water Department has reviewed your April 26, 2000 letter requesting permission to discharge pretreated groundwater from a pump test at the above location to the City's sanitary sewer system. Approval is hereby granted provided the following conditions are met:

- o BTEX ≤ 40 PPM.
- o SGT-HEM (non-polar O&G by EPA method 1664) ≤ 100 PPM.
- o No floating layer or visible sheen is present.
- o Not to exceed 10% of the lower explosive limit at the point of discharge.
- o Extreme caution must be exercised to ensure the discharge is to the sanitary sewer as discharges to the storm sewer are prohibited.
- o Exceedances of permitted limits should be reported pursuant to Section 3.3.7 of the City's Wastewater Control Regulations.
- o Flow readings and analytical data are provided to this office along with a check for the volume of groundwater discharged at the current rate ($4.59/1000 cf as of May, 00).
- o In the event that an ongoing remediation discharge will occur, a permit will be required

This permit expires 45 days from the date of this letter or at the end of the project, whichever occurs first.
Please feel free to contact me at 215-685-4910 or Mr. Lonnie Goldiner at 215-685-6239, if you have any questions relating to this matter.

Sincerely,

Keith D. Houck
Assistant Manager
Industrial Waste Unit

C:\lonnie.goldiner@phila.gov\GROUNDW\sunoco 2899 holme ave.doc

CITY OF PHILADELPHIA

DEPARTMENT OF PUBLIC HEALTH
Walter H. Tsou, MD, MPH
Health Commissioner

John F. Domzalski
Executive Deputy/Chief of Staff

Public Health Services
E. Jane Hix
Assistant Health Commissioner

Air Management Services
Morris Fine
Director

Source Registration
321 University Avenue, 2nd Floor
Philadelphia, PA 19104

Telephone (215) 685-7572
Fax (215) 685-7593

May 2, 2000

Mr. John Zatyczyc, PG., Geologist
Mulry & Cresswell Environmental, Inc.
1691 Horseshoe Pike
Manor Professional Building, Suite 1
Glendora, PA 19343

RE: Eight-hour temporary Vapor Extraction test, at the Sunoco Station (DUNS #0005-1078) 2899 Holme Avenue.

Dear Mr. Zatyczyc:

This letter is in response to your letter dated April 26, 2000. Air Management Services hereby approves your request to conduct a one-time, eight hour temporary Vapor Extraction test at the Sunoco Station (DUNS #0005-1078) 2899 Holme Avenue.

If you have any questions, please call me at (215) 685-7572.

Sincerely yours,

Roger M. Fey
Engineering Supervisor
Source Registration

APPENDIX B

GROUNDWATER PUMPING AND VACUUM EXTRACTION TEST-OW 1, GROUNDWATER INFLUENT AND EFFLUENT SAMPLE LABORATORY ANALYTICAL RESULTS

GLA
LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

Marco Droese
MULRY & CRESSWELL ENV.
1691 Horseshoe Pike
Glenmore, PA 19343

RE: Holme Ave.

Dear Marco Droese

Enclosed are the results of analyses for sample(s) received by the laboratory on May 17, 2000. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Andrea Speck
Project Manager

GLA LABORATORIES

1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

MULRY & CRESSWELL ENV.	Project:	Holme Ave.	Sampled: 5/16/00
1691 Horseshoe Pike	Project Number:	Holme Ave.	Received: 5/17/00
Glenmore, PA 19343	Project Manager:	Marco Droese	Reported: 6/1/00 12:42

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
Effluent-OW1	K005261-01	Water	5/16/00
Influent - OW1	K005261-02	Water	5/16/00

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

MULRY & CRESSWELL ENV.	Project:	Holme Ave.	Sampled: 5/16/00
1691 Horseshoe Pike	Project Number:	Holme Ave.	Received: 5/17/00
Glenmore, PA 19343	Project Manager:	Marco Droese	Reported: 6/1/00 12:42

BTEX by EPA Method 8021B
Great Lakes Analytical

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
Effluent-OW1			**K005261-01**				**Water**	
Benzene	0050616	5/26/00	5/27/00	EPA 8021B	0.500	**ND**	ug/l	
Toluene	"	"	"	EPA 8021B	0.500	**ND**	"	
Ethylbenzene	"	"	"	EPA 8021B	0.500	**ND**	"	
Total Xylenes	"	"	"	EPA 8021B	0.500	**ND**	"	
Surrogate: 4-BFB	"	"	"	*86.0-142*		*99.5*	%	

GLA Laboratories, Inc

**Refer to end of report for text of notes and definitions.*

Andrea Speck

Andrea Speck, Project Manager

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

MULRY & CRESSWELL ENV.	Project:	Holme Ave.	Sampled: 5/16/00
1691 Horseshoe Pike	Project Number:	Holme Ave.	Received: 5/17/00
Glenmore, PA 19343	Project Manager:	Marco Droese	Reported: 6/1/00 12:42

General Chemistry
Great Lakes Analytical

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
Effluent-OW1			**K005261-01**				**Water**	
Oil and Grease	0050460	5/18/00	5/19/00	EPA 1664	5.00	ND	mg/l	

GLA Laboratories, Inc

**Refer to end of report for text of notes and definitions.*

Andrea Speck

Andrea Speck, Project Manager

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

MULRY & CRESSWELL ENV.	Project:	Holme Ave.	Sampled:	5/16/00
1691 Horseshoe Pike	Project Number:	Holme Ave.	Received:	5/17/00
Glenmore, PA 19343	Project Manager:	Marco Droese	Reported:	6/1/00 12:42

Volatile Organic Compounds by EPA Method 8260A
Sequoia Analytical - Walnut Creek

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
Influent - OW1			**K005261-02**				**Water**	
Methyl tert-butyl ether	0E26019	5/27/00	5/28/00	EPA 8260A	2.0	**100**	ug/l	
Benzene	"	"	"	EPA 8260A	1.0	**120**	"	
Toluene	"	"	"	EPA 8260A	2.0	**19**	"	
Ethylbenzene	"	"	"	EPA 8260A	2.0	**67**	"	
Total Xylenes	"	"	"	EPA 8260A	20	**6500**	"	
Isopropylbenzene	"	"	"	EPA 8260A	2.0	**19**	"	
Naphthalene	"	"	"	EPA 8260A	10	**140**	"	
Surrogate: Dibromofluoromethane	"	"	"	*50-150*		*106*	%	
Surrogate: 1,2-Dichloroethane-d4	"	"	"	*50-150*		*118*	"	
Surrogate: Toluene-d8	"	"	"	*50-150*		*104*	"	
Surrogate: 4-Bromofluorobenzene	"	"	"	*50-150*		*102*	"	

GLA Laboratories, Inc

**Refer to end of report for text of notes and definitions.*

Andrea Speck

Andrea Speck, Project Manager

GLA LABORATORIES
1008 W. Ninth Avenue • King of Prussia, Pennsylvania 19406 (610) 337-9992 FAX (610) 337-9939

MULRY & CRESSWELL ENV.	Project:	Holme Ave.	Sampled:	5/16/00
1691 Horseshoe Pike	Project Number:	Holme Ave.	Received:	5/17/00
Glenmore, PA 19343	Project Manager:	Marco Droese	Reported:	6/1/00 12:42

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

GLA Laboratories, Inc

Andrea Speck

Andrea Speck, Project Manager

GLA LABORATORIES

CHAIN OF CUSTODY REPORT

1008 W. NINTH AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406
(610) 337-9992 FAX (610) 337-9939

Client: Mulry + Cresswell Environmental | Bill To: Delaware | TAT: (5 DAY) 4 DAY 3 DAY 2 DAY 1 DAY < 24 HRS.

Address: 1691 Horseshoe Pike | Address: | DATE RESULTS NEEDED:

Glenmoore PA | | TEMPERATURE UPON RECEIPT: 0°C

Report to: Marco | Phone #: (610) 942-9010 Fax #: (610) 942-9039 | State & Program: | Phone #: ( ) Fax #: ( ) | AIR BILL NO.

Project: Holme Avenue

Sampler: JZ + ML

PO/Quote #:

	FIELD ID, LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX	PRESERVATIVES	NO. CONTAINERS	TYPE CONTAINERS	BTEX - 8021	OTG - 1664	BTEX, MTBE (8260B) Naphthalene (8260B)	Cumene (8260B)	SAMPLE CONTROL: CONTAINERS OK? (Y/N)	PH OK? (Y/N)	GOOD CONDITION	LABORATORY ID NUMBER
1	Effluent - OW1	5/10/00	14:45	water	HCl H_2SO_4	5	40ml/1L	X	X						K0052601-01
2	Influent - OW1	5/10/00	14:35	water	HCl	3	40ml			X	X	X				02
3															
4															
5															
6															
7															
8															
9															
10															

RELINQUISHED	DATE / TIME	RECEIVED	DATE / TIME	RELINQUISHED	DATE / TIME	RECEIVED
[signature]	5/16/00 2:08	[signature]	5-17-00 900			
RELINQUISHED	DATE / TIME	RECEIVED	DATE / TIME	RELINQUISHED	DATE / TIME	RECEIVED

COMMENTS:

PAGE OF

J6958198

GLA Laboratories, Inc. Work Order
K005261

Project/Client Information

Submitted By
MULRY and CRESSWELL ENV.

Project Name
Holme Ave.

Project Number
Holme Ave.

Report To
MULRY and CRESSWELL ENV.
Marco Droese
1691 Horseshoe Pike
Glenmore, PA 19343

Phone: 610-942-9010
Fax: 610-942-9039

Invoice To
MCE
NA
2 Kenley Ct.
Bear, DE 19701

Phone: 302-834-6818
Fax: N/A

Work Order Information

Project Manager
Andrea Speck

Report TAT - Due
5 day(s) - 5/24/00

Received
5/17/00 09:00

Logged In
5/17/00 16:08

Received By
Dominic

Logged In By
Jill Janson

Work Order Comments

Containers are unbroken.
Sample labels/COC agree.
Samples preserved properly.
Samples Received at 0°C

Sample/Analysis Information

LabNumber	SampleName	Matrix	Sampled/ Expires	Analysis Requested	Due	RTAT	Comments
K005261-01	Effluent - OW1	Water	5/16/00				
			5/30/00	BTEX 8021	5/24/00	5	MC
			6/13/00	O&G 1664 SUB	5/24/00	5	
K005261-02	Influent - OW1	Water	5/16/00				
			5/30/00	PADEP UG	5/24/00	5	MC

Reviewed By AKS

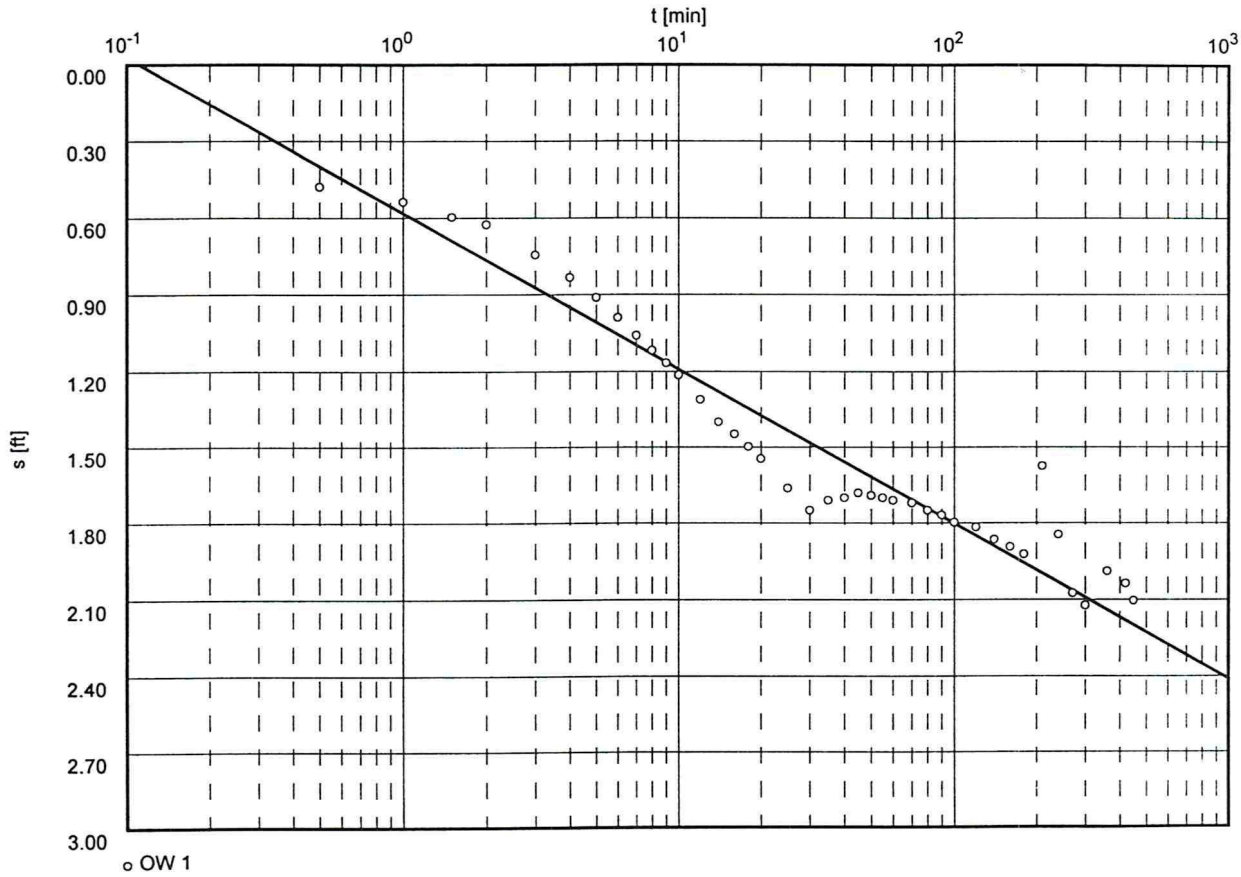
Date 5/18/00

APPENDIX C

PUMP TEST RESULTS

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Unconfined aquifer	Date: 07.06.2000	Page 1
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.36 U.S.gal/min	



Transmissivity [ft²/min]: 1.45×10^{-2}

Hydraulic conductivity [ft/min]: 2.91×10^{-4}

Aquifer thickness [ft]: 50.00

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Unconfined aquifer	Date: 07.06.2000	Page 2
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	Distance from the pumping well 1.0000 ft

Static water level: 36.8600 ft below datum

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]	Corrected drawdown [ft]
2	0.5000	37.3400	0.4800	0.4777
3	1.0000	37.4000	0.5400	0.5371
4	1.5000	37.4600	0.6000	0.5964
5	2.0000	37.4900	0.6300	0.6260
6	3.0000	37.6100	0.7500	0.7444
7	4.0000	37.7000	0.8400	0.8329
8	5.0000	37.7800	0.9200	0.9115
9	6.0000	37.8600	1.0000	0.9900
10	7.0000	37.9300	1.0700	1.0586
11	8.0000	37.9900	1.1300	1.1172
12	9.0000	38.0400	1.1800	1.1661
13	10.0000	38.0900	1.2300	1.2149
14	12.0000	38.1900	1.3300	1.3123
15	14.0000	38.2800	1.4200	1.3998
16	16.0000	38.3300	1.4700	1.4484
17	18.0000	38.3800	1.5200	1.4969
18	20.0000	38.4300	1.5700	1.5454
19	25.0000	38.5500	1.6900	1.6614
20	30.0000	38.6400	1.7800	1.7483
21	35.0000	38.6000	1.7400	1.7097
22	40.0000	38.5900	1.7300	1.7001
23	45.0000	38.5700	1.7100	1.6808
24	50.0000	38.5800	1.7200	1.6904
25	55.0000	38.5900	1.7300	1.7001
26	60.0000	38.6000	1.7400	1.7097
27	70.0000	38.6100	1.7500	1.7194
28	80.0000	38.6400	1.7800	1.7483
29	90.0000	38.6600	1.8000	1.7676
30	100.0000	38.6900	1.8300	1.7965
31	120.0000	38.7100	1.8500	1.8158
32	140.0000	38.7600	1.9000	1.8639
33	160.0000	38.7900	1.9300	1.8928
34	180.0000	38.8200	1.9600	1.9216
35	210.0000	38.4600	1.6000	1.5744
36	240.0000	38.7400	1.8800	1.8447
37	270.0000	38.9800	2.1200	2.0751
38	300.0000	39.0300	2.1700	2.1229
39	360.0000	38.8900	2.0300	1.9888
40	420.0000	38.9400	2.0800	2.0367
41	450.0000	39.0100	2.1500	2.1038

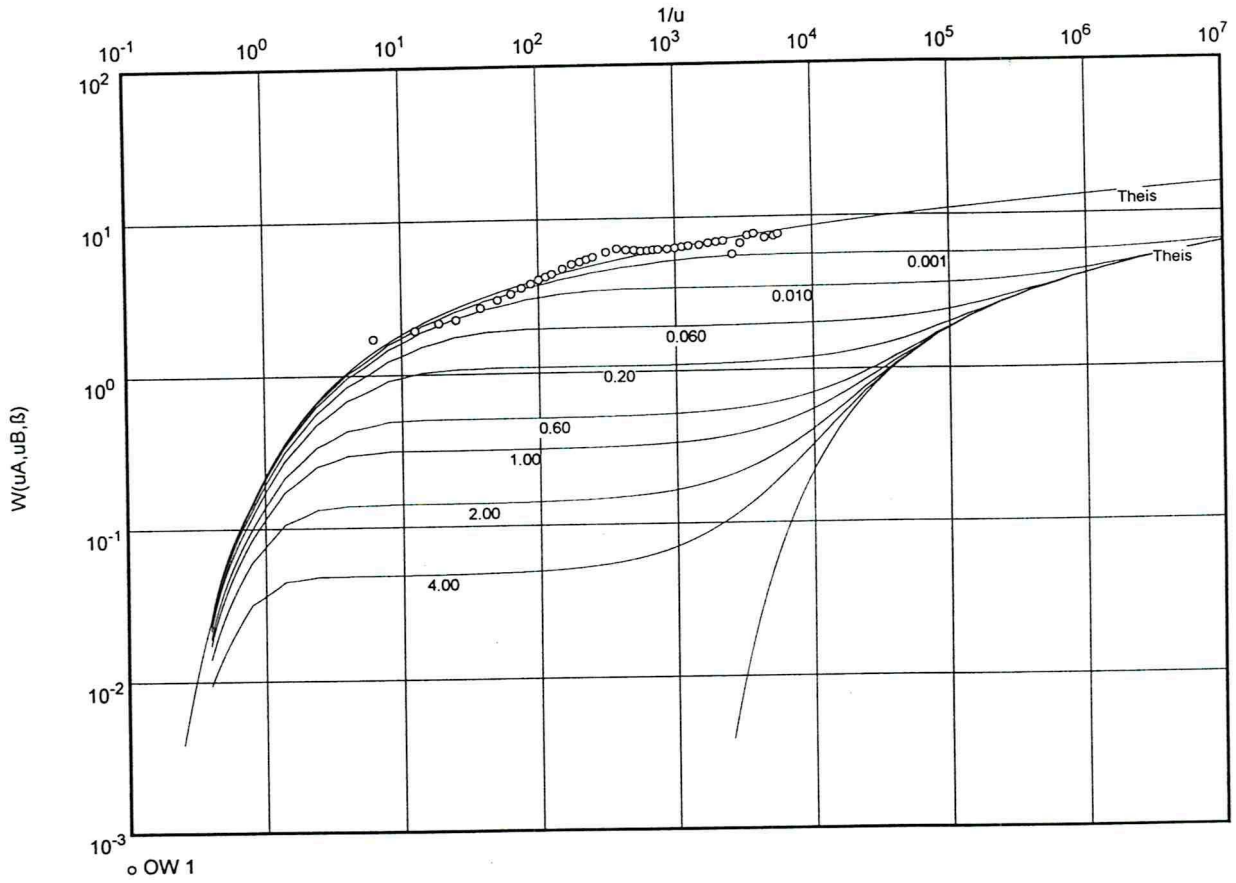
Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Unconfined aquifer	Date: 07.06.2000	Page 3
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	

	Pumping test duration [min]	Discharge [U.S.gal/min]		
1	0.00	0.00		
2	0.50	0.43		
3	1.00	0.43		
4	1.50	0.43		
5	2.00	0.43		
6	3.00	0.43		
7	4.00	0.43		
8	5.00	0.43		
9	6.00	0.43		
10	7.00	0.43		
11	8.00	0.43		
12	9.00	0.43		
13	10.00	0.42		
14	12.00	0.42		
15	14.00	0.42		
16	16.00	0.42		
17	18.00	0.42		
18	20.00	0.42		
19	25.00	0.42		
20	30.00	0.42		
21	35.00	0.42		
22	40.00	0.42		
23	45.00	0.42		
24	50.00	0.34		
25	55.00	0.34		
26	60.00	0.34		
27	70.00	0.34		
28	80.00	0.33		
29	90.00	0.33		
30	100.00	0.33		
31	120.00	0.33		
32	140.00	0.33		
33	160.00	0.33		
34	180.00	0.34		
35	210.00	0.34		
36	240.00	0.38		
37	270.00	0.38		
38	300.00	0.36		
39	360.00	0.36		
40	420.00	0.39		
41	450.00	0.39		
42	480.00	0.34		

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis NEUMAN's method Unconfined aquifer with delayed watertable response	Date: 07.06.2000	Page 1
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.36 U.S.gal/min	



Transmissivity [ft²/min]: 1.37×10^{-2}

Hydraulic conductivity [ft/min]: 2.74×10^{-4}

Aquifer thickness [ft]: 50.00

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis NEUMAN's method Unconfined aquifer with delayed watertable response	Date: 07.06.2000	Page 2
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	Distance from the pumping well 1.0000 ft

Static water level: 36.8600 ft below datum

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]	Corrected drawdown [ft]
2	0.5000	37.3400	0.4800	0.4777
3	1.0000	37.4000	0.5400	0.5371
4	1.5000	37.4600	0.6000	0.5964
5	2.0000	37.4900	0.6300	0.6260
6	3.0000	37.6100	0.7500	0.7444
7	4.0000	37.7000	0.8400	0.8329
8	5.0000	37.7800	0.9200	0.9115
9	6.0000	37.8600	1.0000	0.9900
10	7.0000	37.9300	1.0700	1.0586
11	8.0000	37.9900	1.1300	1.1172
12	9.0000	38.0400	1.1800	1.1661
13	10.0000	38.0900	1.2300	1.2149
14	12.0000	38.1900	1.3300	1.3123
15	14.0000	38.2800	1.4200	1.3998
16	16.0000	38.3300	1.4700	1.4484
17	18.0000	38.3800	1.5200	1.4969
18	20.0000	38.4300	1.5700	1.5454
19	25.0000	38.5500	1.6900	1.6614
20	30.0000	38.6400	1.7800	1.7483
21	35.0000	38.6000	1.7400	1.7097
22	40.0000	38.5900	1.7300	1.7001
23	45.0000	38.5700	1.7100	1.6808
24	50.0000	38.5800	1.7200	1.6904
25	55.0000	38.5900	1.7300	1.7001
26	60.0000	38.6000	1.7400	1.7097
27	70.0000	38.6100	1.7500	1.7194
28	80.0000	38.6400	1.7800	1.7483
29	90.0000	38.6600	1.8000	1.7676
30	100.0000	38.6900	1.8300	1.7965
31	120.0000	38.7100	1.8500	1.8158
32	140.0000	38.7600	1.9000	1.8639
33	160.0000	38.7900	1.9300	1.8928
34	180.0000	38.8200	1.9600	1.9216
35	210.0000	38.4600	1.6000	1.5744
36	240.0000	38.7400	1.8800	1.8447
37	270.0000	38.9800	2.1200	2.0751
38	300.0000	39.0300	2.1700	2.1229
39	360.0000	38.8900	2.0300	1.9888
40	420.0000	38.9400	2.0800	2.0367
41	450.0000	39.0100	2.1500	2.1038

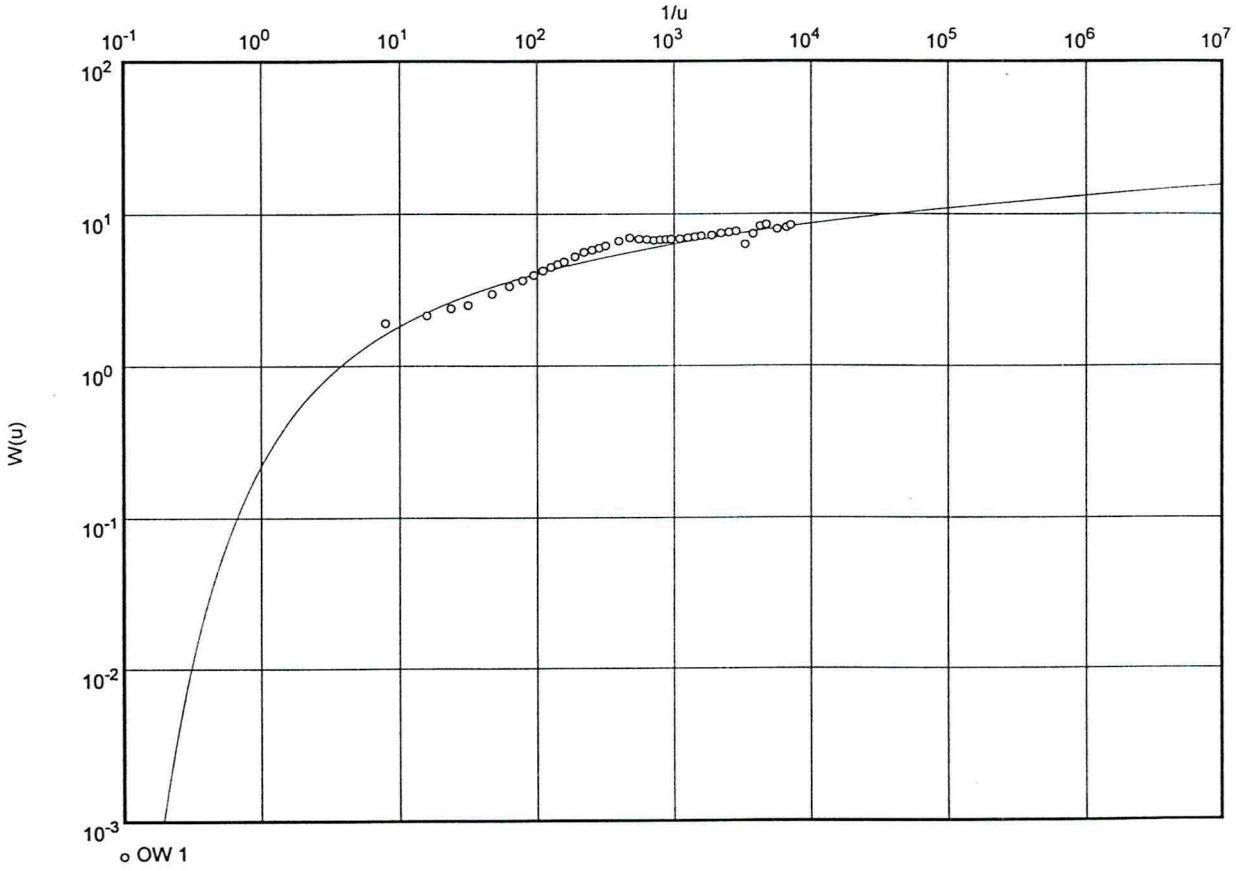
Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis NEUMAN's method Unconfined aquifer with delayed watertable response	Date: 07.06.2000	Page 3
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	

	Pumping test duration [min]	Discharge [U.S.gal/min]		
1	0.00	0.00		
2	0.50	0.43		
3	1.00	0.43		
4	1.50	0.43		
5	2.00	0.43		
6	3.00	0.43		
7	4.00	0.43		
8	5.00	0.43		
9	6.00	0.43		
10	7.00	0.43		
11	8.00	0.43		
12	9.00	0.43		
13	10.00	0.42		
14	12.00	0.42		
15	14.00	0.42		
16	16.00	0.42		
17	18.00	0.42		
18	20.00	0.42		
19	25.00	0.42		
20	30.00	0.42		
21	35.00	0.42		
22	40.00	0.42		
23	45.00	0.42		
24	50.00	0.34		
25	55.00	0.34		
26	60.00	0.34		
27	70.00	0.34		
28	80.00	0.33		
29	90.00	0.33		
30	100.00	0.33		
31	120.00	0.33		
32	140.00	0.33		
33	160.00	0.33		
34	180.00	0.34		
35	210.00	0.34		
36	240.00	0.38		
37	270.00	0.38		
38	300.00	0.36		
39	360.00	0.36		
40	420.00	0.39		
41	450.00	0.39		
42	480.00	0.34		

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Theis analysis method Unconfined aquifer	Date: 07.06.2000	Page 1
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.36 U.S.gal/min	



Transmissivity [ft²/min]: 1.53×10^{-2}

Hydraulic conductivity [ft/min]: 3.07×10^{-4}

Aquifer thickness [ft]: 50.00

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Theis analysis method Unconfined aquifer	Date: 07.06.2000	Page 2
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	Distance from the pumping well 1.0000 ft

Static water level: 36.8600 ft below datum

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]	Corrected drawdown [ft]
2	0.5000	37.3400	0.4800	0.4777
3	1.0000	37.4000	0.5400	0.5371
4	1.5000	37.4600	0.6000	0.5964
5	2.0000	37.4900	0.6300	0.6260
6	3.0000	37.6100	0.7500	0.7444
7	4.0000	37.7000	0.8400	0.8329
8	5.0000	37.7800	0.9200	0.9115
9	6.0000	37.8600	1.0000	0.9900
10	7.0000	37.9300	1.0700	1.0586
11	8.0000	37.9900	1.1300	1.1172
12	9.0000	38.0400	1.1800	1.1661
13	10.0000	38.0900	1.2300	1.2149
14	12.0000	38.1900	1.3300	1.3123
15	14.0000	38.2800	1.4200	1.3998
16	16.0000	38.3300	1.4700	1.4484
17	18.0000	38.3800	1.5200	1.4969
18	20.0000	38.4300	1.5700	1.5454
19	25.0000	38.5500	1.6900	1.6614
20	30.0000	38.6400	1.7800	1.7483
21	35.0000	38.6000	1.7400	1.7097
22	40.0000	38.5900	1.7300	1.7001
23	45.0000	38.5700	1.7100	1.6808
24	50.0000	38.5800	1.7200	1.6904
25	55.0000	38.5900	1.7300	1.7001
26	60.0000	38.6000	1.7400	1.7097
27	70.0000	38.6100	1.7500	1.7194
28	80.0000	38.6400	1.7800	1.7483
29	90.0000	38.6600	1.8000	1.7676
30	100.0000	38.6900	1.8300	1.7965
31	120.0000	38.7100	1.8500	1.8158
32	140.0000	38.7600	1.9000	1.8639
33	160.0000	38.7900	1.9300	1.8928
34	180.0000	38.8200	1.9600	1.9216
35	210.0000	38.4600	1.6000	1.5744
36	240.0000	38.7400	1.8800	1.8447
37	270.0000	38.9800	2.1200	2.0751
38	300.0000	39.0300	2.1700	2.1229
39	360.0000	38.8900	2.0300	1.9888
40	420.0000	38.9400	2.0800	2.0367
41	450.0000	39.0100	2.1500	2.1038

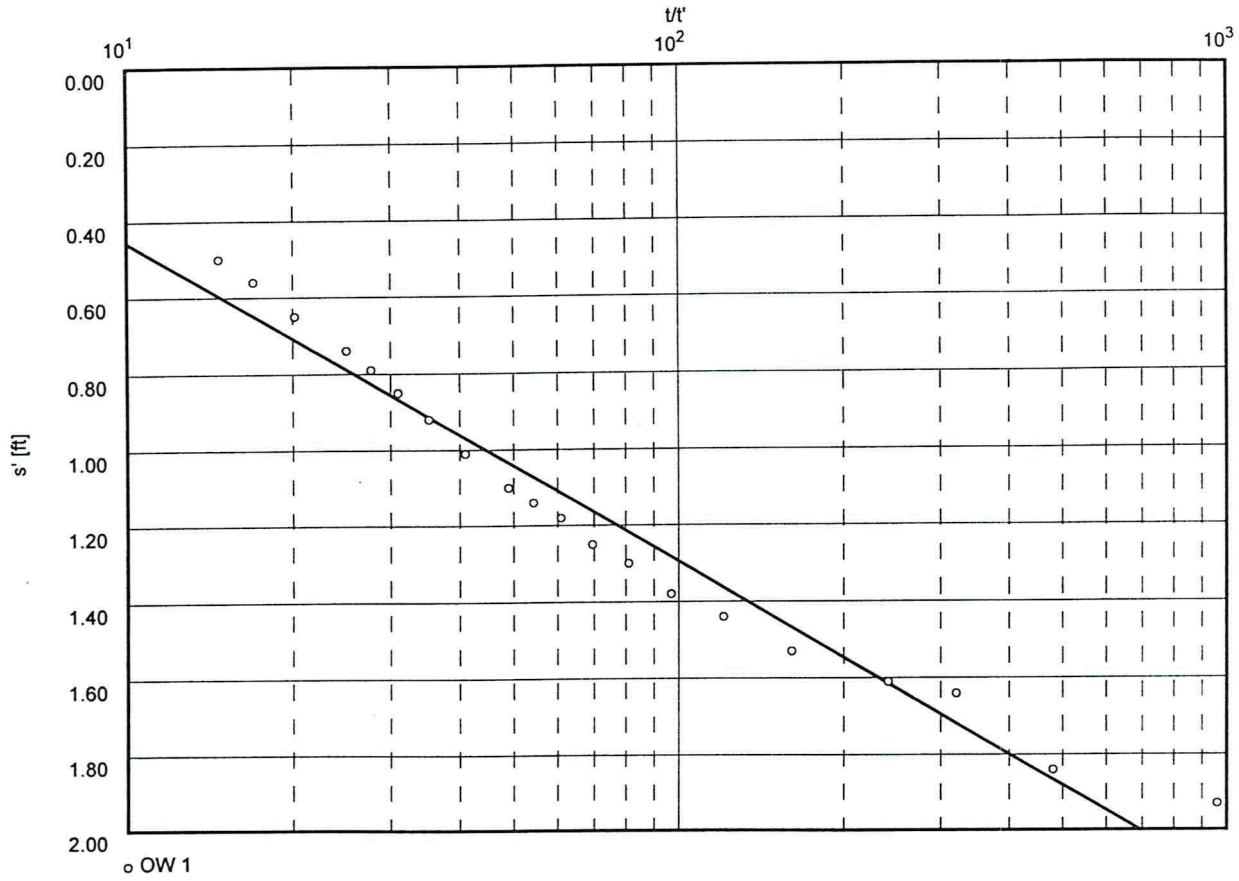
Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Theis analysis method Unconfined aquifer	Date: 07.06.2000	Page 3
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	

	Pumping test duration [min]	Discharge [U.S.gal/min]
1	0.00	0.00
2	0.50	0.43
3	1.00	0.43
4	1.50	0.43
5	2.00	0.43
6	3.00	0.43
7	4.00	0.43
8	5.00	0.43
9	6.00	0.43
10	7.00	0.43
11	8.00	0.43
12	9.00	0.43
13	10.00	0.42
14	12.00	0.42
15	14.00	0.42
16	16.00	0.42
17	18.00	0.42
18	20.00	0.42
19	25.00	0.42
20	30.00	0.42
21	35.00	0.42
22	40.00	0.42
23	45.00	0.42
24	50.00	0.34
25	55.00	0.34
26	60.00	0.34
27	70.00	0.34
28	80.00	0.33
29	90.00	0.33
30	100.00	0.33
31	120.00	0.33
32	140.00	0.33
33	160.00	0.33
34	180.00	0.34
35	210.00	0.34
36	240.00	0.38
37	270.00	0.38
38	300.00	0.36
39	360.00	0.36
40	420.00	0.39
41	450.00	0.39
42	480.00	0.34

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 08.06.2000	Page 1
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.34 U.S.gal/min	
	Pumping test duration: 480.00 min



Transmissivity [ft²/min]: 9.91×10^{-3}

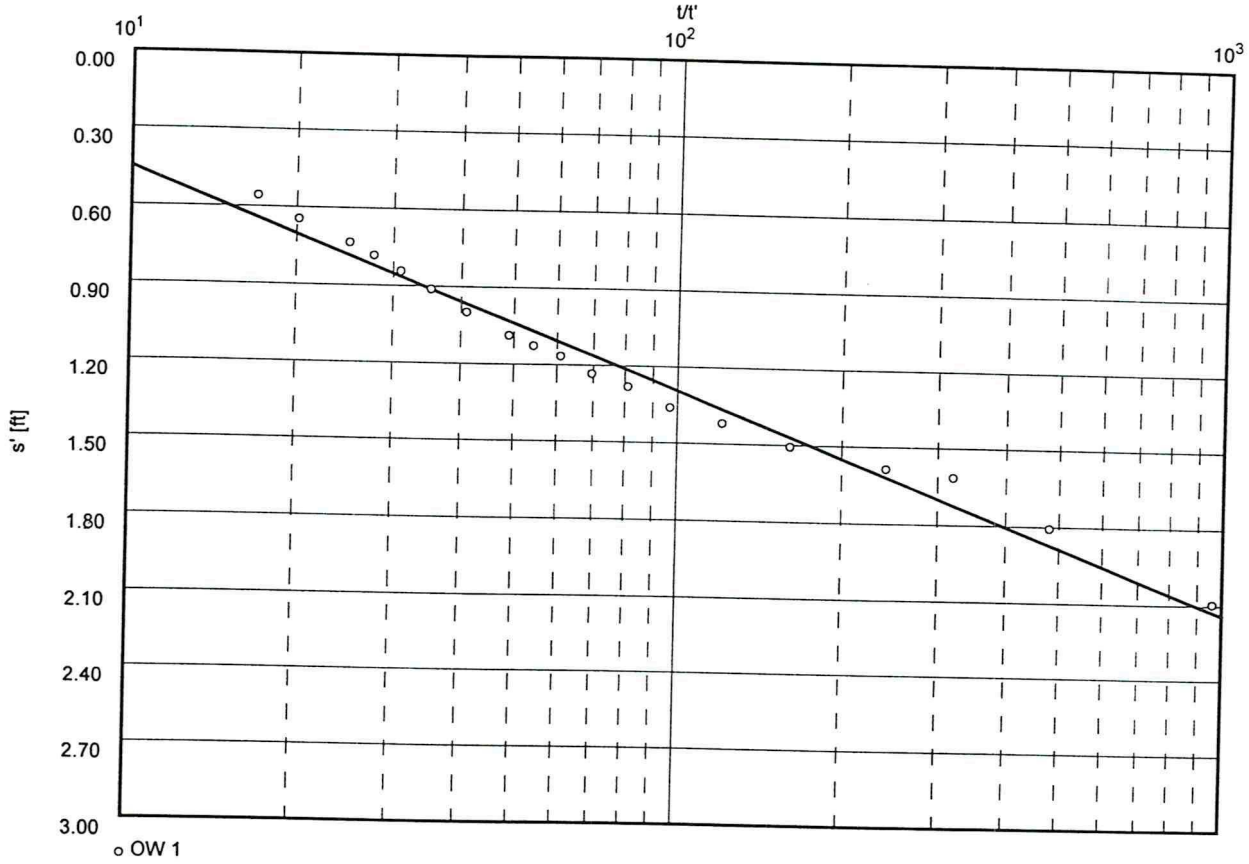
Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 08.06.2000	Page 2
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.34 U.S.gal/min	Distance from the pumping well 1.0000 ft
Static water level: 36.8600 ft below datum	Pumping test duration: 480.00 min

	Time from end of pumping [min]	Water level [ft]	Residual drawdown [ft]	
2	0.5000	38.7900	1.9300	
3	1.0000	38.7000	1.8400	
4	1.5000	38.5000	1.6400	
5	2.0000	38.4700	1.6100	
6	3.0000	38.3900	1.5300	
7	4.0000	38.3000	1.4400	
8	5.0000	38.2400	1.3800	
9	6.0000	38.1600	1.3000	
10	7.0000	38.1100	1.2500	
11	8.0000	38.0400	1.1800	
12	9.0000	38.0000	1.1400	
13	10.0000	37.9600	1.1000	
14	12.0000	37.8700	1.0100	
15	14.0000	37.7800	0.9200	
16	16.0000	37.7100	0.8500	
17	18.0000	37.6500	0.7900	
18	20.0000	37.6000	0.7400	
19	25.0000	37.5100	0.6500	
20	30.0000	37.4200	0.5600	
21	35.0000	37.3600	0.5000	

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Recovery method after THEIS & JACOB Unconfined aquifer	Date: 30.06.2000	Page 1
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.36 U.S.gal/min	
	Pumping test duration: 480.00 min



Transmissivity [ft²/min]: 1.04×10^{-2}

Hydraulic conductivity [ft/min]: 2.09×10^{-4}

Aquifer thickness [ft]: 50.00

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Recovery method after THEIS & JACOB Unconfined aquifer	Date: 30.06.2000	Page 2
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	Distance from the pumping well 1.0000 ft
Static water level: 36.8600 ft below datum	Pumping test duration: 480.00 min

	Time from end of pumping [min]	Water level [ft]	Residual drawdown [ft]	Corrected drawdown [ft]
1	0.5000	39.0000	2.1400	2.0942
2	1.0000	38.7000	1.8400	1.8061
3	1.5000	38.5000	1.6400	1.6131
4	2.0000	38.4700	1.6100	1.5841
5	3.0000	38.3900	1.5300	1.5066
6	4.0000	38.3000	1.4400	1.4193
7	5.0000	38.2400	1.3800	1.3610
8	6.0000	38.1600	1.3000	1.2831
9	7.0000	38.1100	1.2500	1.2344
10	8.0000	38.0400	1.1800	1.1661
11	9.0000	38.0000	1.1400	1.1270
12	10.0000	37.9600	1.1000	1.0879
13	12.0000	37.8700	1.0100	0.9998
14	14.0000	37.7800	0.9200	0.9115
15	16.0000	37.7100	0.8500	0.8428
16	18.0000	37.6500	0.7900	0.7838
17	20.0000	37.6000	0.7400	0.7345
18	25.0000	37.5100	0.6500	0.6458
19	30.0000	37.4200	0.5600	0.5569

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Recovery method after THEIS & JACOB Unconfined aquifer	Date: 30.06.2000	Page 3
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

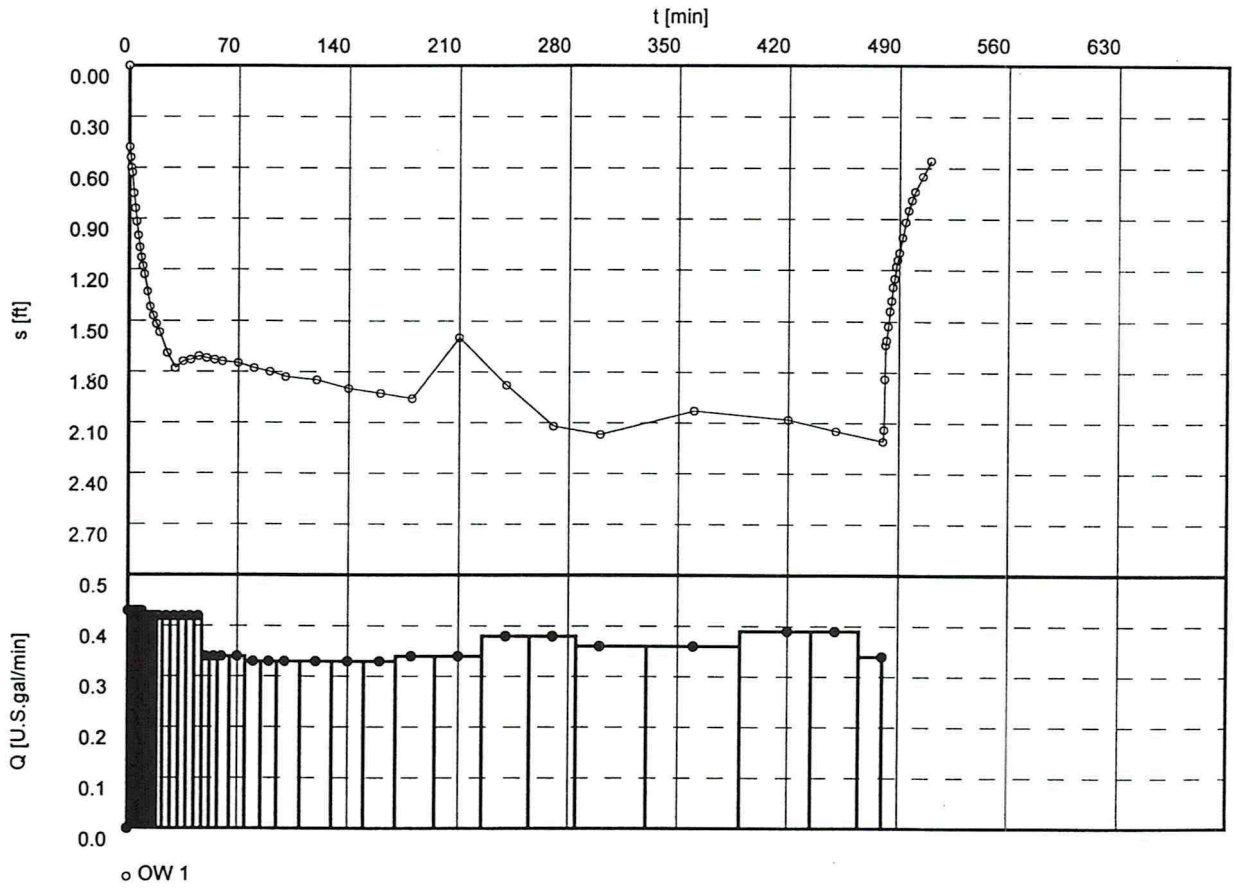
Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.36 U.S.gal/min	

Pumping test duration: 480.00 min

	Pumping test duration [min]	Discharge [U.S.gal/min]		
1	0.00	0.00		
2	0.50	0.43		
3	1.00	0.43		
4	1.50	0.43		
5	2.00	0.43		
6	3.00	0.43		
7	4.00	0.43		
8	5.00	0.43		
9	6.00	0.43		
10	7.00	0.43		
11	8.00	0.43		
12	9.00	0.43		
13	10.00	0.42		
14	12.00	0.42		
15	14.00	0.42		
16	16.00	0.42		
17	18.00	0.42		
18	20.00	0.42		
19	25.00	0.42		
20	30.00	0.42		
21	35.00	0.42		
22	40.00	0.42		
23	45.00	0.42		
24	50.00	0.34		
25	55.00	0.34		
26	60.00	0.34		
27	70.00	0.34		
28	80.00	0.33		
29	90.00	0.33		
30	100.00	0.33		
31	120.00	0.33		
32	140.00	0.33		
33	160.00	0.33		
34	180.00	0.34		
35	210.00	0.34		
36	240.00	0.38		
37	270.00	0.38		
38	300.00	0.36		
39	360.00	0.36		
40	420.00	0.39		
41	450.00	0.39		
42	480.00	0.34		

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Time-Drawdown plot with discharge	Date: 30.06.2000	Page 1
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.36 U.S.gal/min	



Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Time-Drawdown plot with discharge	Date: 30.06.2000	Page 2
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	Distance from the pumping well 1.0000 ft
Static water level: 36.8600 ft below datum	

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]	
1	0.0000	36.8600	0.0000	
2	0.5000	37.3400	0.4800	
3	1.0000	37.4000	0.5400	
4	1.5000	37.4600	0.6000	
5	2.0000	37.4900	0.6300	
6	3.0000	37.6100	0.7500	
7	4.0000	37.7000	0.8400	
8	5.0000	37.7800	0.9200	
9	6.0000	37.8600	1.0000	
10	7.0000	37.9300	1.0700	
11	8.0000	37.9900	1.1300	
12	9.0000	38.0400	1.1800	
13	10.0000	38.0900	1.2300	
14	12.0000	38.1900	1.3300	
15	14.0000	38.2800	1.4200	
16	16.0000	38.3300	1.4700	
17	18.0000	38.3800	1.5200	
18	20.0000	38.4300	1.5700	
19	25.0000	38.5500	1.6900	
20	30.0000	38.6400	1.7800	
21	35.0000	38.6000	1.7400	
22	40.0000	38.5900	1.7300	
23	45.0000	38.5700	1.7100	
24	50.0000	38.5800	1.7200	
25	55.0000	38.5900	1.7300	
26	60.0000	38.6000	1.7400	
27	70.0000	38.6100	1.7500	
28	80.0000	38.6400	1.7800	
29	90.0000	38.6600	1.8000	
30	100.0000	38.6900	1.8300	
31	120.0000	38.7100	1.8500	
32	140.0000	38.7600	1.9000	
33	160.0000	38.7900	1.9300	
34	180.0000	38.8200	1.9600	
35	210.0000	38.4600	1.6000	
36	240.0000	38.7400	1.8800	
37	270.0000	38.9800	2.1200	
38	300.0000	39.0300	2.1700	
39	360.0000	38.8900	2.0300	
40	420.0000	38.9400	2.0800	
41	450.0000	39.0100	2.1500	
42	480.0000	39.0700	2.2100	
43	480.5000	39.0000	2.1400	
44	481.0000	38.7000	1.8400	
45	481.5000	38.5000	1.6400	
46	482.0000	38.4700	1.6100	
47	483.0000	38.3900	1.5300	
48	484.0000	38.3000	1.4400	
49	485.0000	38.2400	1.3800	
50	486.0000	38.1600	1.3000	

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Time-Drawdown plot with discharge	Date: 30.06.2000	Page 3
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	OW 1
Discharge 0.36 U.S.gal/min	Distance from the pumping well 1.0000 ft

Static water level: 36.8600 ft below datum

	Pumping test duration [min]	Water level [ft]	Drawdown [ft]	
51	487.0000	38.1100	1.2500	
52	488.0000	38.0400	1.1800	
53	489.0000	38.0000	1.1400	
54	490.0000	37.9600	1.1000	
55	492.0000	37.8700	1.0100	
56	494.0000	37.7800	0.9200	
57	496.0000	37.7100	0.8500	
58	498.0000	37.6500	0.7900	
59	500.0000	37.6000	0.7400	
60	505.0000	37.5100	0.6500	
61	510.0000	37.4200	0.5600	

Mulry & Cresswell Environmental, Inc. 1691 Horseshoe Pike, Manor Prof. Bldg., Suite 1 Glenmoore, PA 19343	Pumping test analysis Time-Drawdown plot with discharge	Date: 30.06.2000	Page 4
		Project: 2899 Holme Avenue	
		Evaluated by: JMZ	

Pumping Test No.	Test conducted on: 16 May 2000
OW 1	
Discharge 0.36 U.S.gal/min	

	Pumping test duration [min]	Discharge [U.S.gal/min]		
1	0.00	0.00		
2	0.50	0.43		
3	1.00	0.43		
4	1.50	0.43		
5	2.00	0.43		
6	3.00	0.43		
7	4.00	0.43		
8	5.00	0.43		
9	6.00	0.43		
10	7.00	0.43		
11	8.00	0.43		
12	9.00	0.43		
13	10.00	0.42		
14	12.00	0.42		
15	14.00	0.42		
16	16.00	0.42		
17	18.00	0.42		
18	20.00	0.42		
19	25.00	0.42		
20	30.00	0.42		
21	35.00	0.42		
22	40.00	0.42		
23	45.00	0.42		
24	50.00	0.34		
25	55.00	0.34		
26	60.00	0.34		
27	70.00	0.34		
28	80.00	0.33		
29	90.00	0.33		
30	100.00	0.33		
31	120.00	0.33		
32	140.00	0.33		
33	160.00	0.33		
34	180.00	0.34		
35	210.00	0.34		
36	240.00	0.38		
37	270.00	0.38		
38	300.00	0.36		
39	360.00	0.36		
40	420.00	0.39		
41	450.00	0.39		
42	480.00	0.34		

APPENDIX D

GROUNDWATER PUMPING AND VACUUM EXTRACTION TEST-OW 1, SOIL VAPOR INFLUENT SAMPLE LABORATORY ANALYTICAL RESULTS

Lancaster Laboratories
Where quality is a science.

LL Sample No. AQ 3383184

Collected:05/16/2000 16:50 by JZ

Submitted: 05/17/2000 19:25
Reported: 05/22/00 at 05:29 AM
Discard: 6/22/00
Influent - OW1 Grab Tedlar Bag Sample
Holme Ave., PA

Account Number: 06702

Mulry & Cresswell Enviro.
2 Kenley Court
Bear DE 19701

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation	Units	Dilution Factor
07045	MTBE	1634-04-4	45.	4.	mg/m3	1
07048	C2-C10 Hydrocarbons	n.a.	400.	20.	mg/m3 propane	1
07059	BTEX					
07063	Benzene	71-43-2	< 3.	3.	mg/m3	1
07064	Toluene	108-88-3	< 4.	4.	mg/m3	1
07065	Ethylbenzene	100-41-4	< 5.	5.	mg/m3	1
07068	Xylene (total)	1330-20-7	34.	9.	mg/m3	1

Commonwealth of Pennsylvania Lab Certification No. 36-037

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07045	MTBE	EPA Method 18 & 25 modified	2	05/18/2000 12:35	David I. Ressler	1
07048	C2-C10 Hydrocarbons	EPA Method 18 & 25 modified	2	05/18/2000 12:35	David I. Ressler	1
07059	BTEX	EPA Method 18 & 25 modified	1	05/18/2000 12:35	David I. Ressler	1

Lancaster Laboratories

A division of Thermo Analytical Inc.

On 05/17/00, 1 sample was submitted to Lancaster Laboratories
Below are listed our sample numbers with your corresponding description and code.

Please refer to your Lancaster Laboratories client account number when submitting samples or corresponding with the laboratory.

***** 35.00% discount applied to all analysis charges *****

Account Number: 06702

MR JAMES MULRY
MULRY & CRESSWELL ENVIRO
1691 HORSESHOE PIKE
MANOR PROFESSIONAL BLDG STE 1
GLENMORE PA 19343

Phone: 610-942-9010
FAX : 16109429039

BILL TO: MR JAMES MULRY
MULRY & CRESSWELL ENVIRO
2 KENLEY COURT
BEAR DE 19701

Phone: 610-942-9010

P.O. NUMBER: HOLME AVE REL NUMBER: SPECIAL JOB NO: QUOTE NUMBER:

COPIES TO:
1 Mulry & Cresswell Enviro.
Mr. James Mulry
1691 Horseshoe Pike
Manor Professional Bldg, Ste 1
Glenmore PA 19343

LLI No.	Sample Code/Description	Lab Use	Tot Price	Discnt	Tot Estimate
AQ3383184	Influent - OW1 Grab Tedlar Bag Sample Holme Ave., PA Collected on 05/16/00 at 1650 by JZ Analysis Numbers:1560 7042 7045 7048 7059	G	100.00	35.00	65.00

SUB TOTALS	100.00	35.00	65.00
Pickup Charge			0.00
*** ESTIMATED TOTAL			$65.00

	Analysis Name	TAT	QTY	List Price	Discount Price	Gross Estimate	Discount	Net Estimate
1560 38	Lab Chronicle	STD	1	0.00	0.00	0.00	0.00	0.00
7042 30	Whole Air Analysis by GC	STD	1	70.00	45.50	70.00	24.50	45.50
7045 30	MTBE	STD	1	10.00	6.50	10.00	3.50	6.50
7048 30	C2-C10 Hydrocarbons	STD	1	10.00	6.50	10.00	3.50	6.50
7059 30	BTEX	STD	1	10.00	6.50	10.00	3.50	6.50
Total Analysis and Prep charges						100.00	35.00	65.00
	SUB TOTALS					100.00	35.00	65.00
	*** ESTIMATED TOTAL					$100.00	$35.00	$65.00

BILLING ... All fees are charged or billed directly to the client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibilty.

The paperwork submitted with your samples will be assumed to describe the testing protocol you desire. Any changes to this protocol must be submitted to LLI in writing. If testing is already in progress, you will be billed. (Our FAX number is 717-656-2681. Send changes to: Client Services - URGENT!)

Lancaster Laboratories reserves the right to amend this acknowledgement if the sample(s) as received require additional preparation charges.

FOR LAB USE: 715216 270 N 10 30 05/17/00 1925 DIS000 N 48 327 10 35.00 N

Lancaster Laboratories
Where quality is a science.

ANALYTICAL RESULTS

Prepared for:

Mulry & Cresswell Enviro.
2 Kenley Court
Bear DE 19701

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

SAMPLE GROUP

The sample group for this submittal is 715216. Samples arrived at the laboratory on Wednesday, May 17, 2000. The PO# for this group is HOLME AVE.

Client Description	Lancaster Labs Number
Influent - OW1 Grab Tedlar Bag Sample	3383184

METHODOLOGY

The specific methodologies used in obtaining the enclosed analytical results are indicated on the laboratory chronicles.

1 COPY TO Mulry & Cresswell Enviro. Attn: Mr. James Mulry

Questions? Contact your Client Services Representative
Carrie A. Fleming at (717) 656-2300.

Respectfully Submitted,
Donald L. Shelly Jr

APPENDIX C
Quick Domenico Spreadsheet

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION,1ST ORDER DECAY and RETARDATION - WITH CALIBRATION TOOL

Project:	Gatz Auto		
Date:	5/28/2025	Prepared by:	RMH
		Contaminant:	Benzene (MW-1) - 30 yr

SOURCE CONC (MG/L)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)	Time (days) (days)
0.666	3.56E+00	3.56E-01	1.00E-03	0.000958	30	3	10950

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm^{3})	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
3.90E-01	0.0025	0.3	1.8	58	5.00E-03	2.74	0.001186131

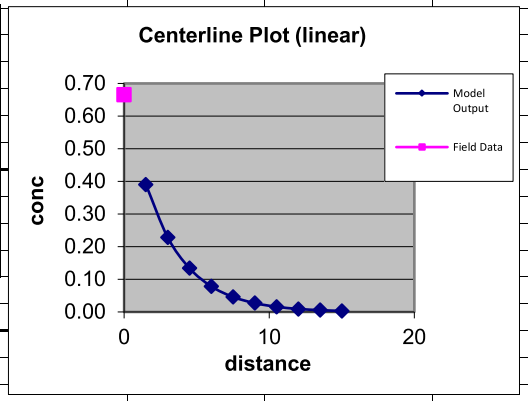
NEW QUICK_DOMENICO.XLS

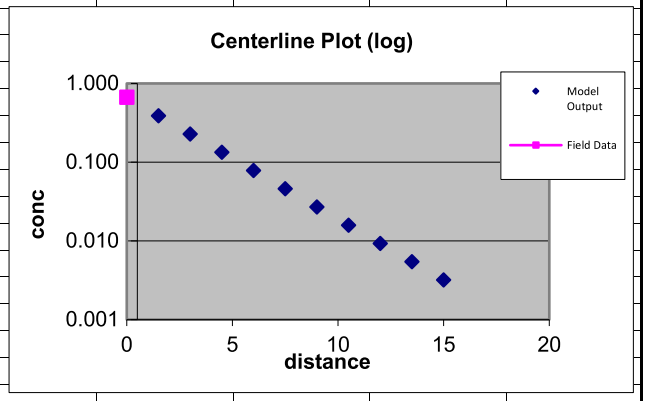
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

Point Concentration

x(ft)	y(ft)	z(ft)
14	0	

	x(ft)	y(ft)	z(ft)
Conc. At	14	0	0
at	10950	days =	0.005 mg/l





AREAL MODEL CALCULATION DOMAIN

Length (ft)	15
Width (ft)	15

	1.5	3	4.5	6	7.5	9	10.5	12	13.5	15
15	0.195	0.114	0.067	0.039	0.023	0.014	0.008	0.005	0.003	0.002
7.5	0.390	0.229	0.134	0.079	0.046	0.027	0.016	0.009	0.005	0.003
0	0.390	0.229	0.134	0.079	0.046	0.027	0.016	0.009	0.005	0.003
-7.5	0.390	0.229	0.134	0.079	0.046	0.027	0.016	0.009	0.005	0.003
-15	0.195	0.114	0.067	0.039	0.023	0.014	0.008	0.005	0.003	0.002

Field Data:	Centerline C Concentration			0.666						
	Distance from Source			0						

APPENDIX D
Regenesis RegenOx® Literature

RegenOx® Technical Description

Close up of RegenOx

RegenOx is an advanced chemical oxidation technology that destroys contaminants through powerful, yet controlled chemical reactions. This product maximizes *in situ* chemical oxidation (ISCO) performance through use of a two-part product system; a sodium percarbonate oxidizer complex activated by a patented surface catalyst system. The technology degrades pollutants through direct oxidation, as well as through the generation of a suite of free radical compounds which in turn oxidize recalcitrant contaminants. RegenOX rapidly and effectively destroys a range of target contaminants including petroleum hydrocarbons and chlorinated compounds.

RegenOx is especially effective in destroying target contaminants present in high concentration source areas within the saturated and vadose zones. For petroleum hydrocarbon treatment, RegenOx produces oxygen as a result of its reactions, providing seamless transition from ISCO to enhanced aerobic bioremediation. RegenOx produces minimal heat when applied, and continues to destroy contaminants for up to 30 days on a single application. RegenOx is safe for use in direct contact with underground utilities, since it is non-corrosive to concrete and most metals.

$$C_2Cl_4 + 4/3\ Na_2CO_3 \bullet 2H_2O_2 + 4NaOH \rightarrow 2CO_2 + 4NaCl + 4H_2O + 4/3\ Na_2CO_3$$

- Free Radical Oxidation via production of:
  - Perhydroxyl Radical ($HO_2\bullet$)
  - Hydroxyl Radical ($OH\bullet$)
  - Superoxide Radical ($O_2^{-}\bullet$)

For a list of treatable contaminants with the use of RegenOx, view the Range of Treatable Contaminants Guide

Chemical Composition – Part A Oxidant

- Sodium Percarbonate – CAS #15630-89-4
- Sodium Carbonate Monohydrate - CAS #5968-11-6
- Silicic Acid – CAS #7699-11-6
- Silica Gel – CAS #63231

Chemical Composition – Part B Activator Complex

- Silicic Acid, Sodium Salt, Sodium Silicate - CAS#1344-09-08
- Silica Gel – CAS #63231
- Ferrous Sulfate – CAS #7720-78-7
- Water – CAS#7732-18-5

Properties

- Bulk Density – Part A 0.9-1.2 g/cm3; Part B – 1.39 g/cm3
- pH - 10-11 per recommended mixing ratios (3-5% oxidant in solution)
- Solubility – Oxidant - 14.5 g/100 g water; Activator – miscible in water
- Appearance – Brown to orange-brown when mixed with water
- Odor – Not detectable
- Vapor Pressure – None
- Non-hazardous

RegenOx® Technical Description

Storage and Handling Guidelines

Storage
Store in a cool, dry place out of heat/direct sunlight
Store at temperatures not to exceed 40°C/104°F
Store in original tightly closed container
Store in a well-ventilated place
Do not store near combustible materials
Store away from incompatible materials
Protect from contamination
Provide appropriate exhaust ventilation in places where dust is formed

Handling
Minimize dust generation and accumulation
Observe good industrial hygiene practices
Keep away from clothing and combustible materials
Take any precaution to avoid mixing with combustibles
Avoid contact with eyes
Do not taste or swallow
Do not eat, drink or smoke nearby
Wear appropriate personal protective equipment
Wash hands thoroughly after handling
Avoid release to the environment

Applications

RegenOx is applied using direct-injection techniques or wells. The application process enables the two- part product to be combined, then pressure-injected into the zone of contamination and moved out into the aquifer media. Application instructions for this product are contained in the RegenOx Application Instructions Guide.

Health and Safety

Material is relatively safe to handle; however, we recommend avoiding contact with eyes, skin and clothing. OSHA Level D personal protection equipment including vinyl or rubber gloves, eye protection and dust mask are recommended when handling this product. Please review the Material Safety Data Sheet for additional storage, packaging, usage, and handling requirements here: RegenOx Part A SDS and RegenOx Part B SDS.

REGENESIS

www.regenesis.com
1011 Calle Sombra, San Clemente CA 92673
949.366.8000

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