MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
REMEDIATION AND REDEVELOPMENT DIVISION

REQUEST FOR EGLE REVIEW – RESPONSE ACTIVITY PLAN TO COMPLY WITH 7A(1)(B)

FOR EGLE USE ONLY
SUBMITTAL REVIEW DUE DATE: _____

This form is required for submittal of a request for the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to review a Response Activity Plan, under Section 20114b, Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The Response Activity Plan to Comply with 7a(1)(b), must address the entire property, all complete pathways, and propose the necessary response activities to mitigate unacceptable exposures for all pathways determined to complete.

This form is for use by a prospective owner or operator who is not yet required to be in compliance with their Section 20107a obligations, but is requesting EGLE review of response activities under 7a(1)(b) to be conducted upon their purchase, occupancy or foreclosure that are intended to prevent or mitigate an unacceptable exposure.

OR

This form is for use by a current owner or operator who must undertake response activities under Section 20107a(1)(b) to achieve compliance with their Section 20107a(1)(b) obligation to mitigate an unacceptable exposure. A current owner or operator of contaminated property has obligations under Section 20107a (due care) with respect to any existing contamination on the property to prevent unacceptable exposure.

If additional data or other information needs to be acquired to conduct an adequate evaluation to determine complete pathways or appropriate response activities, this is not the correct response activity plan submittal form.

EGLE will make every effort to review the response activity plan within 45 business days after receipt, but not later than 150 days per section 20114b(3) EGLE will, approve, approve with conditions, or deny the response activity plan, or will notify the submitter the plan does not contain sufficient information for EGLE to make a decision.

Current owners or operators who believe they are in compliance with all their applicable Section 20107a (due care) obligations need to use form EQP 4402, Documentation of Due Care Compliance, and request review under Section 20114g(2), Part 201 of the NREPA.

Section A: Submitter Information

Legal Entity/Person requesting review: MLK on 2nd Limited Dividend Housing Association, LLC	Complete if contact for questions if different from legal entity: Relationship of contact person to the submitter: Consultant
Street Address: 32500 Telegraph Road, Suite 102	Contact Name: J. Adam Patton
City: Bingham Farms State: MI Zip: 48025	Contact Title: Vice President
Contact Name: T. Van Fox	Street Address: 4080 W. 11 Mile
Contact Title: President	City: Berkley State: MI Zip: 48072
Phone: 248-833-0550	Phone: 517-202-4288
Email: vanfox@mhthousing.net	Email: patton@pmenv.com

Section B: Property Information

Street Address of Property: 3515 2nd Avenue	Town: 2 South Range: 12 East Section: 7
City: Detroit State: MI Zip: 48201	Quarter: Quarter-Quarter:
County: Wayne	Decimal Degrees Latitude: 43.3450 Decimal Degrees Longitude: -83.0633
Property Tax ID (include all applicable ID's): 01000689-90	Reference point for latitude and longitude: Center of Site ☒ Main/Front Door ☐
Part 201 Site ID # (if known):	Front gate/Main Entrance ☐ Other ☐
City/Village/Township: Detroit	Collection Method: Survey ☐ GPS ☐ Interpolation ☒

Section C: Status of Submitter Relative to the Property (Check all that apply)	
Current Owner ☐	Prospective Owner ☒
Current Operator ☐	Prospective Operator ☐
Date Submitter became the owner or operator:	Date Submitter anticipates becoming the owner or operator: April 2022

Section D: Current or Proposed Property Use	
Current Use	**Proposed Use**
Residential ☐	Residential ☐
Nonresidential ☒	Nonresidential ☐
Mixed Use ☐	Mixed Use ☒

Section E: The following questions assist EGLE in evaluating this request
On-site Well(s) (Check all that apply): Drinking Water ☐ Industrial/Commercial Production ☐ Agriculture/Irrigation ☐ No Well on-site ☒
Approximate Depth of Well(s):
Has a Baseline Environmental Assessment (BEA) been previously submitted for this property? Yes ☐ No ☒
Date BEA Submitted:
BEA Number:

Section F: Category of Applicable Generic Cleanup Criteria or Site-specific Criteria**		
Generic	**Site-Specific (check all that apply)**	
Residential ☒	Residential ☒	EGLE Provided – Requested 2/10/2022 ☒
Nonresidential ☐	Nonresidential ☐	Submitter Developed Section 20120b(2) & (3) ☐

****EGLE review required within 90 days of EGLE receipt of the Response Activity Plan, per Section 20120b.**

Section G: Complete Pathways (Check all that apply)**		
Item	**Residential**	**Nonresidential**
Drinking Water / Drinking Water Protection	☐	☐
Direct Contact	☒	☐
Soil Volatilization to Indoor Air Inhalation	☒	☐
Groundwater Volatilization to Indoor Air Inhalation	☐	☐
Ambient Air	☒	☐
Particulate Inhalation	☒	☐
Other:	☐	☐

****Response Activities must be proposed for all complete pathways and for the entire property.**

Section H: Proposed Response Activities (Check all that apply)	
Item	
Excavation	☐
Physical or Engineered Exposure Barrier	☒
Containment: Physical or Hydraulic	☐
Active Soil Remediation System	☐
Active Groundwater Remediation System	☐
Passive Vapor Mitigation System	☐
Active Vapor Mitigation System	☒
Rule 1013(6) Notice(s)	☐
Rule 1015 Notice	☐
Rule 1019 Notice	☐

Section H (Continued): Proposed Response Activities (Continued)(Check all that apply)	
MIOSHA Demonstration Section 20120a(18)	☐
Other (specify):	☐

Section I: Environmental Professional Signature

With my signature below, I certify that this plan and all related materials are true, accurate, and complete to the best of my knowledge and belief.

Signature:		Date: 8/15/2022
Printed Name: J. Adam Patton		
Company of Environmental Professional: PM Environmental, Inc.		
Street Address: 4080 W. 11 Mile		
City: Berkley	State: Michigan	Zip: 48072
Phone: 517-202-4288	Email: patton@pmenv.com	

Section J: Submitter Signature

With my signature below, I certify that this plan and all related materials are true, accurate, and complete to the best of my knowledge and belief.

Signature:		Date: 8/15/2022
Printed Name: T. Van Fox		
Title and relationship of signatory to submitter: President of MHT Housing, Inc.		
Street Address: 32500 Telegraph Road, Suite 100		
City: Bingham Farms	State: MI	Zip: 48205
Phone: 248-833-0550	Email: vanfox@mhthousing.com	

This form and the Response Activity Plan to Comply with 7a(1)(b) should be submitted to the EGLE Remediation & Redevelopment Division District Office for the county in which the property is located, unless the response activity is related to a property that is regulated by another EGLE Division. EGLE District Office contact information by County can be accessed at: https://www.michigan.gov/egle/0,9429,7-135-3311_4109_9846-321402--,00.html. If regulated by another division, contact should be made with that division for information on where to submit the form and plan. The Response Activity Plan is a stand-alone document and should contain all information necessary for EGLE to render a decision.

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RESPONSE ACTIVITY PLAN

Vacant Land
3515 2nd Avenue | Detroit, Michigan
PM Project Number 01-12411-1-0001

Prepared for:

MLK on 2nd Limited Dividend Housing Association, LLC
32600 Telegraph Road, Suite 102
Bingham Farms, Michigan 48025

Prepared by:

PM Environmental, Inc.
4080 West Eleven Mile Road
Berkley, Michigan 48072

PM ENVIRONMENTAL
Risk Well Managed

Corporate Headquarters
Lansing, Michigan
3340 Ranger Road, Lansing, MI 48906
f: 877.884.6775
t: 517.321.3331

Michigan Locations
Berkley **Lansing**
Grand Rapids **Oak Park**
Flint

August 12, 2022

District Supervisor
Michigan Department of Environment, Great Lakes and Energy
Southeastern Michigan District Office
27700 Donald Court
Warren, Michigan 48092

RE: Response Activity Plan for: Vacant Land
3315 2nd Avenue, Detroit, Wayne County, Michigan
PM Environmental, Inc. Project No. 01-12411-1-0001

Dear District Supervisor:

Enclosed is a copy of a Response Activity Plan to Comply with 7a(1)(b) (ResAP) submitted under Section 20114b, Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, for review and approval to secure funding through The Michigan State Housing Development Authority (MSHDA). The ResAP outlines the response activities to be taken by MLK on 2nd Limited Dividend Housing Association, LLC during construction and post-construction as part of the redevelopment activities to address exposure pathways determined to be complete at the property.

If you have any questions regarding the information in this report, please contact us at 800.313.2966.

Sincerely,
PM ENVIRONMENTAL, INC.

J. Adam Patton
Vice President

Beth Sexton
Chief Operating Officer

PM ENVIRONMENTAL
Risk Well Managed

Corporate Headquarters
Lansing, Michigan
3340 Ranger Road, Lansing, MI 48906
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Michigan Locations
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August 12, 2022

Ms. Kathryn Thoits
MLK on 2nd Limited Dividend Housing Association, LLC
32600 Telegraph Road, Suite 102
Bingham Farms, Michigan 48025

RE: Response Activity Plan for: Vacant Land
3315 2nd Avenue, Detroit, Wayne County, Michigan
PM Environmental, Inc. Project No. 01-12411-1-0001

Dear Ms. Thoits:

Enclosed is a copy of a Response Activity Plan to Comply with 7a(1)(b) (ResAP) submitted under Section 20114b, Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The Response Activity Plan outlines the response activities to be taken by MLK on 2nd Limited Dividend Housing Association, LLC during construction and post-construction as part of the redevelopment activities to address exposure pathways determined to be complete at the property.

THIS REPORT WAS COMPLETED FOR MLK ON 2ND LIMITED DIVIDEND HOUSING ASSOCIATION, LLC, MHT HOUSING INC., AND THE MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY, EACH OF WHOM MAY RELY ON THE REPORT'S CONTENTS.

If you have any questions regarding the information in this report, please contact us at 800.313.2966.

Sincerely,
PM ENVIRONMENTAL, INC.

J. Adam Patton
Vice President

Beth Sexton
Chief Operating Officer

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APPENDICES

1.0 INTRODUCTION

This Response Activity Plan to Comply with Section 7a(1)(b) (ResAP) was prepared on behalf of MLK on 2nd Limited Dividend Housing Association, LLC for the Vacant Land (Parcel ID: 04000689-90) located at 3515 2nd Avenue, Detroit, Wayne County, Michigan (hereafter referred to as the "subject property") (Figures 1 and 2), and submitted to the Department of Environment, Great Lakes, and Energy (EGLE) for review and approval in accordance with Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

The purpose of the response activities proposed by MLK on 2nd Limited Dividend Housing Association, LLC is to effectively address the complete exposure pathways through which there is an unacceptable exposure and to describe the response activities necessary to mitigate the unacceptable exposures. By submittal of this ResAP, MLK on 2nd Limited Dividend Housing Association, LLC is seeking EGLE approval that the proposed response activities will be adequate, if implemented as proposed and documented with sufficient data, to allow for residential use of the subject property. MLK on 2nd Limited Dividend Housing Association, LLC intends to purchase the subject property in August 2022.

2.0 DETAILED PROPERTY DESCRIPTION

2.1 Property Description

The subject property consists of one parcel of land totaling 0.356 acres and is located on the northwest corner of Martin Luther King Jr. Boulevard and 2nd Avenue in Detroit, Wayne County, Michigan (Figure 1). The subject property is currently vacant and contains areas of gravel and grass. The northern portion of the property is surrounded by chain-link fence (Figure 2).

The subject property is currently zoned SD-2: Mixed Zoning. The intended use is consistent with Residential property use as defined under Part 201.

There are no conditions at the property that are or could result in erosion of surface soils creating a risk to off-site properties or conditions that are or could result in dispersion of particulate or volatile hazardous substances in surface soils at the property creating a risk to off-site properties.

No persons will conduct work in an easement, under the terms of a utility franchise, or pursuant to severed subsurface mineral rights or severed subsurface formations at the subject property. There are no land or resource use restrictions recorded against the property.

There are no abandoned containers on the subject property.

There are no response activities or corrective actions being undertaken at the property by a liable or non-liable person.

There are no underground storage tanks (USTs) or above ground storage tanks (ASTs) present on the subject property.

There are fire or explosion hazards at the subject property.

No persons will conduct work in an easement, under the terms of a utility franchise, or pursuant to severed subsurface mineral rights or severed subsurface formations at the subject property.

2.2 Property Features

Municipal water and sewer, natural gas, electrical, and telecommunications utilities are available to the subject property. No water supply wells exist on the subject property.

3.0 PROPERTY USE

3.1 Current and Intended Property Use

MLK on 2nd Limited Dividend Housing Association, LLC intends to develop the subject property with a mixed use residential and commercial multi-story building (Figure 2). The assessing information and Proposed Development Site Concept Drawings and Renderings for the subject property are included as Appendix A. The proposed development plans are illustrated on Figure 2. MLK on 2nd Limited Dividend Housing Association, LLC intends to construct one four-story, slab-on-grade foundation with an elevator containing an elevator pit with sump, mixed use apartment building containing 7,126 square feet with 33 residential units. The first floor will contain both commercial retail and residential units. The second to fourth floors will contain residential units. Following redevelopment activities, the subject property will primarily consist of concrete paved parking and drives, portions of building foundations, and limited landscaped areas.

Municipal water, sanitary sewer, natural gas, electrical, and telecommunications utilities are available at the subject property. No water wells are currently present on the subject property, and none will be installed at the property in the future.

The proposed building will be constructed with concrete slab on grade structures, with an elevator pit at a depth of 5 feet below grade, containing a concrete sump with no inlets/outlets to the sub-grade environment. The building will be heated and cooled with packaged heating cooling and ventilation (HVAC) systems that source return air from within the building, and will be equipped with a natural gas powered generator that will power critical building systems in the event of a power outage.

There are no conditions at the subject property that are or could result in erosion of surface soils creating a risk to off-site properties or conditions that are or could result in dispersion of particulate or volatile hazardous substances in surface soils at the property creating a risk to off-site properties.

3.2 Historical Property Use

Standard and other historical sources were able to document that the subject property was developed prior to 1889 with two dwellings in the southeastern and southwestern portions and a stable and outbuilding in the northern portion. The stable and outbuilding were demolished and a garage was constructed in the northern portion in 1913. The southeastern dwelling was demolished and a gasoline dispensing and service station was constructed in the southeastern portion in 1924 with two gasoline USTs depicted north of the building in the 1950 and 1953 Sanborn maps. The gasoline dispensing station and remaining dwelling were demolished in 1954 when a new gasoline dispensing and service station building was constructed in the southwestern

portion. Based on review of historical records, gasoline dispensing operations likely ceased by at least 1978 and automotive service operations likely ceased between 1995 and 2000. The northern garage was demolished between 1966 and 1972. The gasoline service station building was demolished in 2018, and the subject property has consisted entirely of vacant land since that time.

The subject property was occupied by gasoline dispensing operations from at least 1924 until 1977, and automotive service operations from at least 1924 until 1995. The previous site investigation included the area of the former gasoline dispensing and automotive service operations and based on the analytical results the subject property is classified a "facility," as defined by Part 201 of P.A. 451 of the Michigan NREPA, as amended.

Previous Site Investigations

Phase I ESA, ASTI, April 2020

PM was provided with a Phase I Environmental Site Assessment (ESA) for the subject property prepared by ASTI dated April 7, 2020, in conformance with the scope and limitations of ASTM Practice E 1527-13. The report is attached as Appendix B.

The following onsite Recognized Environmental Conditions (RECs)/Vapor Encroachment Concerns (VECs) were identified for the subject property in ASTI's April 2020 Phase I ESA:

- The subject property operated as a gasoline filling station from at least 1926 to 1977 before modern leak/release detection were common to detect compromised USTs and piping. Additionally, based on the nature of gasoline filling station operations, a release may have occurred from chronic over filling over an extended period.

- From at least 1967 to 1995, in addition to gasoline filling operations, the site operated as a tire and battery service and/or automobile service shop and used car sales lot with unknown materials management practices.

- At least two gasoline USTs were used at the subject property. Additional USTs may be present onsite.

The following adjoining and/or nearby REC/VEC was identified in ASTI's April 2020 Phase I ESA:

- The south adjoining property identified as 631 Martin Luther King Jr. Boulevard is a Baseline Environmental Assessment (BEA) site, which are known to contain concentrations of contamination in excess of the most restrictive Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 201 cleanup criteria. Since EGLE records were not obtained and reviewed prior to the completion of ASTI's Phase I ESA, and based on the proximity of the site, the site is considered a REC/VEC for the subject property.

Phase II ESA, PM, August and December 2020

On August 27, 2020, PM completed subsurface investigation activities at the subject property that consisted of advancing five soil borings (SB-1 through SB-5), installing three temporary soil gas sample points (SB/SG-1, SB/SG-3, and SB/SG-5), and collecting seven soil samples and three soil gas samples to assess the RECs/VECs identified in ASTI's April 2020 Phase I ESA. The soil

samples were submitted for laboratory analysis of volatile organic compounds (VOCs), polynuclear aromatic compounds (PNAs), polychlorinated biphenyls (PCBs), and metals (cadmium, chromium and lead), or some combination thereof. The soil gas samples were submitted for laboratory analysis of VOCs.

On December 21, 2020, PM completed additional subsurface investigation activities at the subject property that consisted of advancing 12 soil borings (SB-6 through SB-17) and collecting 26 soil samples to delineate the contamination identified during PM's August 2020 site investigation activities. The soil samples were submitted for laboratory analysis of VOCs and PNAs.

3.3 Property Geology/Hydrogeology/Topography

Based on review of the soil boring logs, the soil stratigraphy of the subject property generally consists of sandy clay and clayey sand to depths between 13.5 and 17.0 feet bgs, underlain by clay to a depth of at least 20.0 feet bgs, the maximum depth explored. Brick debris was encountered in soil borings SB-2, SB-3, and SB-4 at depths ranging between 0.0 and 5.5 feet bgs in the southern-central portion. A copy of PM's August and December 2020 soil boring logs are included in Appendix C.

Groundwater was not encountered in any of the soil borings advanced on the subject property to a depth of 20.0 feet bgs, the maximum depth explored.

The site is 616 feet above mean seal level (msl) according to the United States Geological Survey (U.S.G.S.) 7.5-Minute Topographic Map of the Detroit, Michigan, Quadrangle. The topographic gradient is south-southeast. The closest surface water is the Detroit River, which is located approximately 1.50 miles south of the subject property at an elevation of 585 feet above msl.

The subject property is not located in a Wellhead Protection Area (WHPA).

4.0 IDENTIFICATION OF COMPLETE EXPOSURE PATHWAYS

Exposure Pathway Evaluation		
Complete Pathway?	**Pertinent Property Conditions**	**Explanation, if not complete**
Drinking water pathway is not complete	A person cannot drink groundwater because groundwater is not being used on the property for any purpose	Municipal water is provided to the subject property and no potable or other supply wells exist.
Direct contact pathway is complete	A person can come in contact with contaminated soils on the property (walking, playing, or working on surficial soils with or without vegetation; below surface construction or utility activities)	
Soil particulate inhalation pathway is complete	A person can inhale ambient air particulates from substances present in soils (with or without vegetation) via wind erosion of contaminated soils and vehicle traffic.	

Exposure Pathway Evaluation		
Complete Pathway?	**Pertinent Property Conditions**	**Explanation, if not complete**
Soil volatilization to ambient air pathway is complete	A person can inhale ambient air that contains vapors from volatile substances present in soil.	
Volatilization to indoor air pathway is complete	A person can inhale substances in indoor air from volatile substances present in soil.	
Groundwater-Surface Water Interface Pathway is not complete	A person cannot come in contact with surface water on the property where groundwater is venting to the surface water with contaminants that would present human exposure concerns (e.g., pH exceedances).	Groundwater was not encountered. No surface water exists at the property.

5.0 ASSESSMENT OF APPLICABILITY OF GENERIC CRITERIA

Site conditions were evaluated to determine whether the generic residential criteria for all complete pathways are applicable. Soil samples were not analyzed for diesel range organics (DRO) or gasoline range organics (GRO). Therefore, it is not possible to conclude that residual non-aqueous phase liquid (NAPL) is not present within the soil matrix at concentrations that would preclude the use of the generic residential criteria for either the volatilization to indoor air inhalation pathway or the direct contact pathway due to the presence of residual NAPL.

The applicability of the generic soil volatilization to indoor air criteria was also evaluated in accordance with Appendix C.1 of the EGLE Guidance Document for the Vapor Intrusion Pathway (May 2013 and updated 2022). In addition to the presence of residual NAPL, the proposed building will primarily consist of poured slab-on-grade concrete floors, that includes an elevator pit with a sump, which precludes the use of the generic soil volatilization to indoor air criteria. PM has also identified the presence in soil of hazardous substances with acute, short-term risks that are not addressed by the generic criteria.

Site-specific volatilization to indoor air criteria (SSVIAC) was developed and provided by EGLE on March 21, 2022. A copy of the SSVIAC memo is included in Appendix D.

The subject property/source area size is consistent with the generic 0.5-acre source size used in the development of the criteria for the soil particulate inhalation and soil volatilization to ambient air pathways, as outlined in the 2007 EGLE – Remediation and Redevelopment Operational Memorandum #1 Technical Support Document – Attachment 7 Part 201 Generic Soil Inhalation Criteria for Ambient Air. Therefore, an alternate source-size modifier was not required for the Particulate Soil Inhalation (PSI) and Volatile Soil Inhalation (VSI) criteria.

6.0 IDENTIFCATION OF THE CATEGORY OF APPLICABLE CLEANUP CRITERIA OR SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA (SS VIAC)

The subject property is currently zoned SD-2: Mixed Zoning, which is consistent with a Residential property use as defined under Part 201. Based on the proposed mixed use (i.e., an apartment

building with commercial and residential tenants utilizing the proposed subject building) of the subject property, the category of applicable cleanup criteria and SSVIAC is Residential.

7.0 CONTAMINANT INFORMATION

The analytical results for the soil samples collected from the subject property were compared with EGLE Generic Cleanup Criteria (GCC) and Screening Levels present in Part 201 Rules 299.1 through 299.50, dated December 21, 2020 entitled "Cleanup Criteria Requirements for Response Activity", in accordance with Section 20120a(1) using the Residential DC, PSI, and VSI Cleanup Criteria. For the volatilization to indoor air pathway PM compared the soil and soil gas analytical results to the SSVIAC.

The soil and soil gas analytical results are summarized in Tables 1, 2, and 3 and on Figures 3, 4, and 5. The laboratory analytical reports and associated chains of custody documentation are included in Appendix E.

The complete pathways for which an unacceptable exposure exists requiring activities to mitigate are the Direct Contact (DC) and Volatilization to Indoor Air (VIA) pathways are outlined in the table below.

Summary of Complete Pathways Requiring Response Activity

Location	Sample Depth (feet bgs)	Complete Pathways Requiring Response Activity
SB/SG-1	**Soil:**	**DC, VIA**
	Soil Gas:	**VIA**
SB-2	**Soil:**	**DC, VIA**
SB/SG-3	**Soil:**	**DC, VIA**
	Soil Gas:	None
SB-4	**Soil:**	**DC, VIA**
SB/SG-5	**Soil:**	**DC, VIA**
	Soil Gas:	**VIA**
SB-6	**Soil:**	**DC, VIA**
SB-7	**Soil:**	**DC, VIA**
SB-8	**Soil:**	**DC, VIA**
SB-9	**Soil:**	**DC, VIA**
SB-10	**Soil:**	**DC, VIA**
SB-11	**Soil:**	**DC, VIA**
SB-12	**Soil:**	**DC, VIA**
SB-13	**Soil:**	**DC, VIA**
SB-14	**Soil:**	**DC, VIA**
SB-15	**Soil:**	**DC, VIA**
SB-16	**Soil:**	**DC, VIA**
SB-17	**Soil:**	**DC, VIA**

DC – Direct Contact Pathway
VIA – Volatilization to Indoor Air Pathway

8.0 IDENTIFICATION OF COMPLETE OR LIKELY TO BE COMPLE EXPOSURE PATHWAYS REQUIRING RESPONSE ACTIVITIES TO MITIGATE UNACCEPTABLE EXPOSURES.

8.1 Direct Contact – Soil

Residual LNAPL saturation is present in soil and the generic direct contact criteria are not applicable. Therefore, surface covers consisting of a minimum of six inches of concrete pavement installed using poured slab methods or a minimum of 18 inches of landscaping underlain by a demarcation barrier (i.e., brown/black landscape fabric; refer to Appendix F), and the proposed building foundations, will installed and maintained to prevent contact with the underlying contaminated soils. The proposed surface covers are depicted on Figure 5.

All existing soils requiring excavation to install surface cover will be characterized and transported for disposal at a licensed disposal facility under manifest or bill of lading.

Specifically, landscaped areas will be constructed with an underlayment of landscape fabric set at a bottom elevation of 18-inches below the finished surface grade within the proposed landscaping areas. Above the landscaping fabric, a 12-inch layer of topsoil will be installed. Laboratory analysis of the topsoil will be conducted at the borrow source, with one sample collected per 40-cubic yards to document that it is not contaminated with concentrations exceeding the Part 201 Residential Generic Cleanup Criteria and the SSVIAC established for the subject property, prior to delivery to the subject property. An estimated 85 cubic yards of topsoil will be placed in landscaped areas at the subject property; therefore, a minimum of three soil samples will be collected from topsoil at the borrow source for laboratory analysis.

Laboratory analysis will include VOCs, semi-volatile organic compounds (SVOCs), PCBs, and metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc). Topsoil containing concentrations exceeding the Part 201 Residential Generic Cleanup Criteria or the SSVIAC will not be delivered to or accepted for use at the subject property.

The topsoil will then be overlain by 6-inches of wood mulch sourced from non-reclaimed (i.e. virgin) wood.

During installation, the placement/installation of the landscape fabric underlayment will be documented with photographs and the thickness of the placed topsoil and mulch cover documented via inspections using a ruler or similar measurement device to confirm that the required 12-inch topsoil thickness and 6-inch mulch thickness is achieved. Photographs of the placed topsoil and mulch along with the corresponding measuring device documenting the placed material thickness will be collected. The thickness confirmation measurements will be collected at a rate of one per 200 square feet. Based on the approximate 2,300 square foot area of the planned landscaping areas, a total of 12 soil and mulch confirmation measurements will be collected. Records of all landscape fabric and topsoil/munch installation and measurement activities will be maintained.

The concrete pavement is expected to have a minimum 20-year service life. Landscaping fabric underlayment is expected to have a minimum 20-year service life.

Visual inspections of the surface cover will occur on a monthly basis, unless continual snow cover is present, and will include the following:

- Condition and integrity of non-paved surface cover areas, including landscaping cover, and patches of exposed soils greater than six inches in diameter, indicating that the integrity of the surface cover is incomplete.
- Condition and integrity of concrete surface cover areas, including general condition, and pitting or cracks greater than 0.5-inches in width, through which impacted subsurface soils could be readily accessed.

A visual inspection of the landscape fabric underlayment will also occur 20 years after installation, and annually thereafter to verify its condition and integrity.

Damaged and/or deteriorated surface cover, including landscape fabric, will be repaired and/or replaced with an equivalent surface cover within 14 days of discovery. If repair/replacement of the surface cover is not feasible within the specified timeframe, the areas will be temporarily covered with anchored plastic sheeting, anchored landscaping fabric, or anchored plywood, as appropriate until repair/replacement is complete. Records of the inspections and any associated repair activities, including temporary cover installation, will be maintained for the duration of ownership and/or occupancy of the subject property.

A copy of the surface cover inspection Operations and Maintenance (O&M) Log is included in Appendix F.

MLK on 2nd Limited Dividend Housing Association, LLC will provide written notices all construction and utility contractors working at the subject property regarding the presence of contaminated soils and soil gas. A copy of a model notice is included in Appendix G.

Notice regarding the presence of dermal contact exposure barriers at the subject property will be provided to Lessees at the subject property within their respective lease agreements, which will state:

- Parts of this property was used for automotive service operations. As a result there is contamination in certain portions of the property that are now covered by pavement or landscaping (barriers). No digging, gardening, landscaping, or other activities that affect the integrity of the barriers are allowed.

Copies of the signed lease agreements will be maintained.

8.2 Volatilization to Indoor Air - Soil

A vapor barrier and active sub-slab depressurization system (SSDS) will be installed to prevent soil gas vapors from migrating into the occupied space and/or accumulating beneath the proposed building. The Design and Specifications Plan for the SSDS is included in Appendix H.

9.0 PROPOSED RESPONSE ACTIVITES TO COMPLY WITH APPLICABLE DUE CARE RULES

No response activities are necessary to comply with Due Care Rule 1005, Rule 1009, Rule 1011, Rule 1015, Rule 1017 and Rule 1019.

10.0 SIGNATURES

PM requests that EGLE approve the response activities identified within this ResAP that will allow the subject property to be utilized for Residential purposes with no unacceptable exposures relating to the proposed use of the property.

If you have questions regarding this report, please contact PM at (800) 313.2966.

REPORT PREPARED BY:
PM Environmental, Inc.

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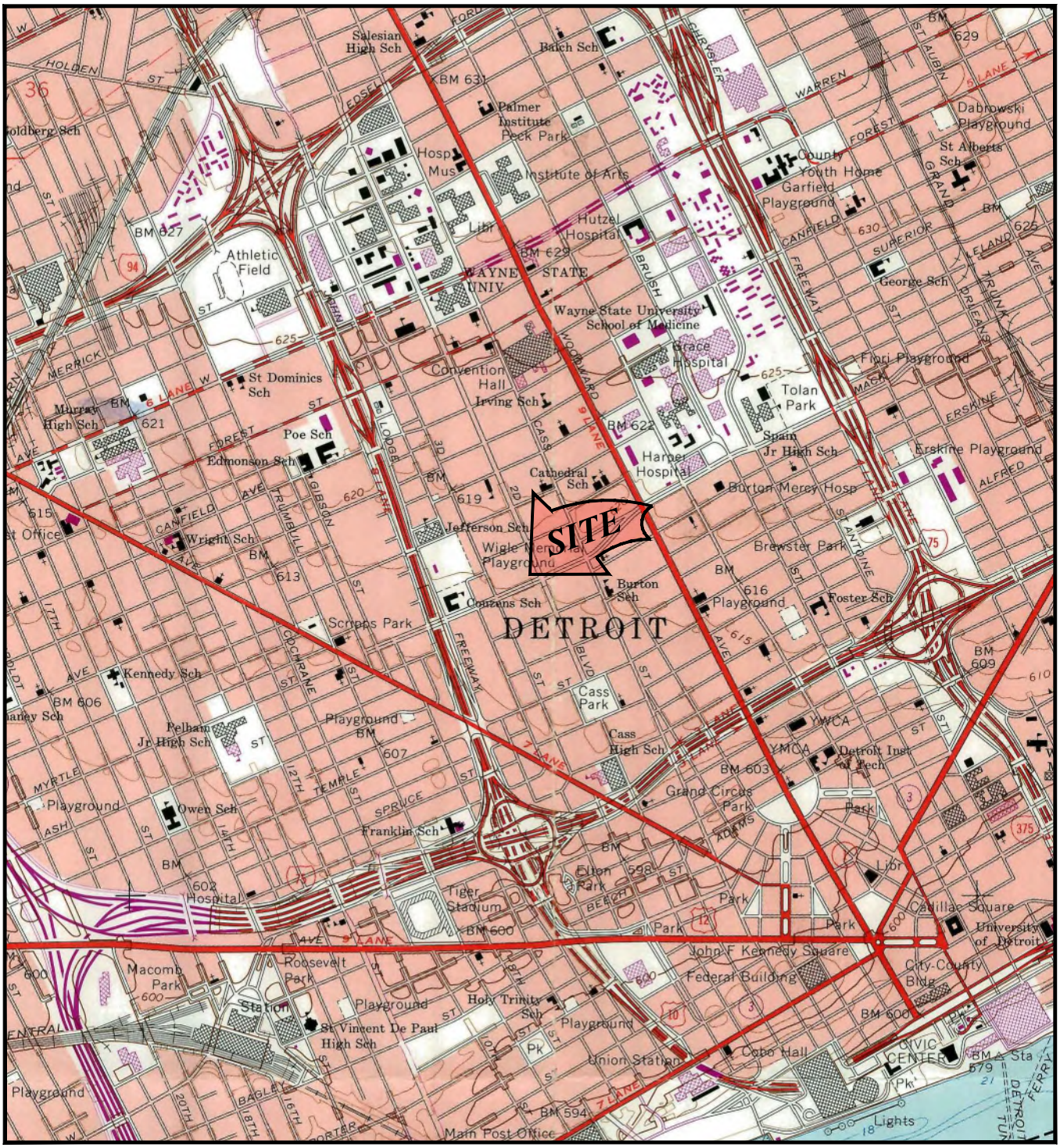
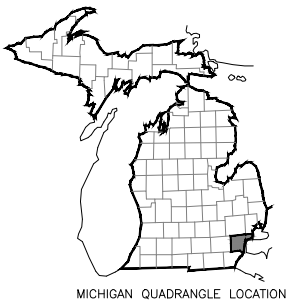
11.0 REFERENCES

- Table 1. Groundwater: Residential and Nonresidential, Part 201 Generic Cleanup Criteria and Screening Levels, Updated December 21, 2020.
- Table 2. Soil: Residential, Part 201 Generic Cleanup Criteria and Screening Levels and Part 213 Risk-Based Screening Levels, Updated June 25, 2018.
- Table 3. Soil: Nonresidential, Part 201 Generic Cleanup Criteria and Screening Levels and Part 213 Risk-Based Screening Levels, Updated June 25, 2018.
- EGLE Volatilization to Indoor Air Pathway Screening Levels, September 4, 2020.
- EGLE Operational Memorandum No. 4 “Site Characterization and Remediation Verification – Attachment 10, Peer Review Draft Groundwater Not in an Aquifer,” February 2007.
- EGLE Operational Memorandum No. 2 “Sampling and Analysis,” October 22, 2004, Revised July 5, 2007.
- Phase I ESA, April 7, 2020, ASTI.

Figures

PM ENVIRONMENTAL Environmental & Engineering Services





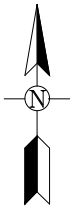
WAYNE COUNTY

FIGURE 1

PROPERTY VICINITY MAP

UNITED STATES GEOLOGICAL SURVEY, 7.5 MINUTE SERIES

DETROIT, MI QUADRANGLE, 1968. PHOTO REVISED 1973 AND 1980.



PM ENVIRONMENTAL | Environmental & Engineering Services

PROJ:
VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 2,000'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
DATE: 9/15/2020
CHKD BY: JB
SCALE: 1" = 2,000'
FILE NAME: 01-12411-0-001F00R00

651 BRAINARD STREET
RESIDENTIAL

ALLEY

3531 2ND AVENUE
RESIDENTIAL

GPR LIMITATION:
A/C UNIT

3525 2ND AVENUE
RESIDENTIAL

GRASS

PARCEL ID:
01000689-90

GRAVEL

SECOND AVENUE

3522 2ND AVENUE
VACANT LAND

3514 2ND AVENUE
VACANT LAND

3500 2ND AVENUE
VACANT COMMERCIAL
BUILDING

630 MARTIN LUTHER KING
BOULEVARD
RESIDENTIAL

SIDEWALK

GPR LIMITATION:
PIPE OF UNKNOWN USE

MARTIN LUTHER KING
JUNIOR BOULEVARD

631 MARTIN LUTHER KING
JUNIOR BOULEVARD
MEDICAL OFFICES

3470 2ND AVENUE
FRED'S KEY SHOP

3469 2ND AVENUE
VACANT LAND

N

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- FENCE
- PROPOSED SITE FEATURES
- GAS
- FORMER GAS
- Ⓐ FORMER AUTOMOTIVE/BATTERY/ TIRE SHOP
- Ⓓ FORMER DWELLING
- Ⓖ FORMER GASOLINE FILLING STATION / DISPENSERS / USTs
- UST UNDERGROUND STORAGE TANK
- GPR SURVEY AREA COMPLETED BY GPRS

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE 2

SUBJECT PROPERTY AND ADJOINING PROPERTIES
WITH GPR SURVEY AREA

PROJ:
VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 30'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
CHKD BY: JB
DATE: 9/15/2020
SCALE: 1" = 30'
FILE NAME: 01-12411-0-001F00R00

SB-1	
8/27/2020	
6.0 – 7.0'	
UNITS	ug/Kg
n-BUTYLB	520
sec-BUTYLB	200
E	260
p-ISOPT	200
2-M	7,100
NAPH	700
n-PROP	230
1,2,3-TMB	1,610
1,2,4-TMB	3,190
1,3,5-TMB	630
X	2,840
OTHER VOCs	<MDL
2-M	700
Ph	400
OTHER PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	10,900
Pb	10,900

SB-1	
8/27/2020	
13.5 – 14.5'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	17,100
Pb	6,980

SB-11	
12/21/2020	
3.0 ~ 4.0'	
UNITS	ug/Kg
VOCs	<MDL
B(a)ANTH	300
B(a)PYR	300
B(b)FLA	500
B(k)FLA	500
CHRYSENE	300
FL	600
Ph	400
Py	500
OTHER PNAs	<MDL

SB-11	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-3	
8/27/2020	
4.0 – 5.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	460
Cr	16,900
Pb	33,800

SB-3	
8/27/2020	
8.0 – 9.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	14,300
Pb	7,830

SB-4	
8/27/2020	
5.0 – 6.0'	
UNITS	ug/Kg
n-BUTYLB	700
n-PROP	160
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	13,200
Pb	48,300

SB-16	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
n-BUTYLB	2,500
sec-BUTYLB	900
2-M	4,000
n-PROP	7,700
OTHER VOCs	<MDL
2-M	2,500
NAPH	1,600
OTHER PNAs	<MDL

SB-16	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-15	
12/21/2020	
3.0 ~ 4.0'	
UNITS	ug/Kg
n-BUTYLB	7,500
sec-BUTYLB	3,100
E	14,600
ISOP	7,000
2-M	12,000
NAPH	13,000
n-PROP	27,500
1,2,3-TMB	5,100
1,2,4-TMB	2,500
1,3,5-TMB	1,200
X	7,000
OTHER VOCs	<MDL
2-M	5,500
NAPH	5,500
OTHER PNAs	<MDL

SB-15	
12/21/2020	
6.0 ~ 7.0'	
UNITS	ug/Kg
n-BUTYLB	210
sec-BUTYLB	90
2-M	500
NAPH	1,600
n-PROP	1,500
OTHER VOCs	<MDL
NAPH	1,000
OTHER PNAs	<MDL

SB-15	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-5	
8/27/2020	
4.0 – 5.0'	
UNITS	ug/Kg
n-BUTYLB	2,410
sec-BUTYLB	800
E	1,400
ISOP	1,700
p-ISOPT	200
2-M	3,400
NAPH	3,300
n-PROP	6,890
T	160
1,2,3-TMB	350
1,2,4-TMB	160
1,3,5-TMB	640
X	400
OTHER VOCs	<MDL
2-M	2,100
NAPH	2,200
OTHER PNAs	<MDL

SB-14	
12/21/2020	
3.0 ~ 4.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-14	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-12	
12/21/2020	
6.0 ~ 7.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-12	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-13	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
VOCs	<MDL
B(a)ANTH	900
B(a)PYR	800
B(b)FLA	1,600
B(k)FLA	1,900
CHRYSENE	1,000
FL	1,600
Ph	700
Py	1,600
OTHER PNAs	<MDL

SB-13	
12/21/2020	
11.0 ~ 12.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-13	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-10	
12/21/2020	
6.5 ~ 7.5'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-10	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-2	
8/27/2020	
5.0 – 6.0'	
UNITS	ug/Kg
2-M	200
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	200
Cr	10,800
Pb	7,290

SB-17	
12/21/2020	
5.0 ~ 6.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-17	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-9	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
n-BUTYLB	13,800
sec-BUTYLB	4,500
E	1,700
ISOP	7,000
2-M	22,000
NAPH	14,000
n-PROP	29,900
X	2,000
OTHER VOCs	<MDL
2-M	7,900
NAPH	4,800
OTHER PNAs	<MDL

SB-9	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-8	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-8	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-6	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-7	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
n-BUTYLB	38,000
sec-BUTYLB	16,000
E	36,000
ISOP	20,000
2-M	45,000
NAPH	20,000
n-PROP	88,000
1,2,3-TMB	5,000
OTHER VOCs	<MDL
ANT	300
2-M	6,100
NAPH	3,200
OTHER PNAs	<MDL

SB-7	
12/21/2020	
7.0 ~ 8.0'	
UNITS	ug/Kg
E	110
n-PROP	410
1,2,3-TMB	70
OTHER VOCs	<MDL
PNAs	<MDL

SB-7	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

651 BRAINE

ALLEY

PARCEL ID: 01000689-90

RESIDENTIAL

GRASS

GRAVEL

SECOND AVENUE

3522 2ND AVENUE

3514 2ND AVENUE

3500 2ND AVENUE

3470 2ND AVENUE

3469 2ND AVENUE

630 MARTIN LUTHER KING BOULEVARD

SIDEWALK

SB-2, SB-4, SB-5, SB-6, SB-7, SB-8, SB-9, SB-10, SB-11, SB-12, SB-13, SB-14, SB-15, SB-16, SB-17, SB/SG-1, SB/SG-3, SB/SG-5

GAS

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- FENCE
- PROPOSED SITE FEATURES
- GAS
- FORMER GAS
- (A) FORMER AUTOMOTIVE/BATTERY/TIRE SHOP
- (D) FORMER DWELLING
- (G) FORMER GASOLINE FILLING STATION / DISPENSERS / USTs
- UST UNDERGROUND STORAGE TANK
- SOIL BORING
- SOIL BORING / TEMPORARY MONITORING WELL

Cd	CADMIUM
Cr	CHROMIUM
Pb	LEAD
2-M	2-METHYLNAPHTHALENE
NAPH	NAPHTHALENE
Ph	PHENANTHRENE
T	TOLUENE
E	ETHYLBENZENE
X	XYLENES
1,2,4-TMB	1,2,4-TRIMETHYLBENZENE
1,3,5-TMB	1,3,5-TRIMETHYLBENZENE
1,2,3-TMB	1,2,3-TRIMETHYLBENZENE
ISOP	ISOPROPYLBENZENE
p-ISOPT	p-ISOPROPYLTOLUENE
n-PROP	n-PROPYLBENZENE
n-BUTYLB	n-BUTYLBENZENE
sec-BUTYLB	sec-BUTYLBENZENE
ANT	ANTHRACENE
B(a)ANTH	BENZO(a)ANTHRACENE
B(a)PYR	BENZO(a)PYRENE
B(b)FLA	BENZO(b)FLUORANTHENE
B(k)FLA	BENZO(k)FLUORANTHENE
FL	FLUORANTHENE
Py	PYRENE
VOCs	VOLATILE ORGANIC COMPOUNDS
PNAs	POLYNUCLEAR AROMATIC COMPOUNDS
PCBs	POLYCHLORINATED BIPHENYLS
MDL	METHOD DETECTION LIMIT

VALUE EXCEEDS SSVIAC AND/OR RESIDUAL LNAPL SATURATION PRESENT IN SOIL

REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE 3

SOIL ANALYTICAL RESULTS

PROJ:

VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE 0 30'

IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS/BP | DATE: 2/12/2021

CHKD BY: JB | SCALE: 1" = 30'

FILE NAME: 01-12411-0-001F00R00

651 BRAINARD STREET

ALLEY

RESIDENTIAL

GRASS

PARCEL ID:
01000689-90

GRAVEL

SECOND AVENUE

3522 2ND AVENUE

3514 2ND AVENUE

3500 2ND AVENUE

3470 2ND AVENUE

3469 2ND AVENUE

630 MARTIN LUTHER KING BOULEVARD

631 MARTIN LUTHER KING JUNIOR BOULEVARD

MARTIN LUTHER KING JUNIOR BOULEVARD

SIDEWALK

SB-12 SB-11 SB/SG-1 SB-13 SB-10 SB-2 SB/SG-3 SB-4 SB-16 SB-17 SB-15 SB-9 SB-14 SB-7 SB/SG-5 SB-6 SB-8

SG-1	
8/27/2020	
5.0'	
UNITS	ug/m³
B	480
CYCLOHEXANE	6,200
E	480
HEPTANE	8,440
HEXANE	3,500
T	1,300
X	3,500
OTHER VOCs	<MDL

SG-3	
8/27/2020	
5.0'	
UNITS	ug/m³
ACETONE	330
B	32
CYCLOHEXANE	130
ETHANOL	85
E	100
4-ETHYLTOLUENE	84
HEPTANE	330
HEXANE	100
2-HEXANONE	45
MEK	440
1,2,4-TMB	230
1,3,5-TMB	93
2,2,4-TMP	140
PCE	34
TETRAHYDROFURAN	15
T	170
X	1,140
OTHER VOCs	<MDL

SG-5	
8/27/2020	
5.0'	
UNITS	ug/m³
CYCLOHEXANE	125,000
E	13,000
HEPTANE	210,000
HEXANE	234,000
2,2,4-TMP	214,000
OTHER VOCs	<MDL

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- FENCE
- PROPOSED SITE FEATURES
- GAS
- FORMER GAS
- (A) FORMER AUTOMOTIVE/BATTERY/ TIRE SHOP
- (D) FORMER DWELLING
- (G) FORMER GASOLINE FILLING STATION / DISPENSERS / USTs
- UST UNDERGROUND STORAGE TANK
- SOIL BORING
- SOIL BORING / TEMPORARY MONITORING WELL

B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	XYLENES
1,2,4-TMB	1,2,4-TRIMETHYLBENZENE
1,3,5-TMB	1,3,5-TRIMETHYLBENZENE
2,2,4-TMP	2,2,4-TRIMETHYLPENTANE
PCE	TETRACHLOROETHENE
MEK	2-BUTANONE (MEK)
VOCs	VOLATILE ORGANIC COMPOUNDS
MDL	METHOD DETECTION LIMIT

- VALUE EXCEEDS SSVIAC

NOTES: REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE 4

SOIL GAS ANALYTICAL RESULTS

PROJ:

VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 30'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS/BP
CHKD BY: JB
DATE: 1/19/2021
SCALE: 1" = 30'
FILE NAME: 01-12411-0-001F00R00

651 BRAINARD STREET

ALLEY

RESIDENTIAL

SECOND AVENUE

3522 2ND AVENUE

3514 2ND AVENUE

3500 2ND AVENUE

3470 2ND AVENUE

3469 2ND AVENUE

630 MARTIN LUTHER KING BOULEVARD

631 MARTIN LUTHER KING JUNIOR BOULEVARD

MARTIN LUTHER KING JUNIOR BOULEVARD

SIDEWALK

GAS

LEGEND:

- SUBJECT PROPERTY
- FENCE
- PROPOSED SITE FEATURES
- GAS
- CONCRETE PAVEMENT
- LANDSCAPING

NOTE: LANDSCAPING AREA TO CONTAIN 18" LAYER OF CLEAN TOPSOIL (12" THICK) AND MULCH (6" THICK UNDERLAIN BY A LANDCAPE FABRIC DEMARCATION BARRIER

N

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE 5

PROPOSED FEATURES
SURFACE COVER MAP

PROJ:

VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: KS	DATE: 3/16/2022
VERIFY SCALE 0 — 30' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHKD BY: JB	SCALE: 1" = 30'
	FILE NAME: 01-12411-0-001F00R00	

Tables

PM ENVIRONMENTAL Environmental & Engineering Services

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
VOCs
3515 2ND AVENUE, DETROIT, MICHIGAN
PM PROJECT #01-12411-1-0001

Volatile Organic Compounds (VOCs) (µg/Kg)			n-Butylbenzene	sec-Butylbenzene	Ethyl benzene	Isopropyl benzene	p-Isopropyltoluene	2-Methylnaphthalene	Naphthalene	n-Propylbenzene	Toluene	1,2,3-Trimethylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes	Other VOCs
Chemical Abstract Service Number (CAS#)			104518	135988	100414	98828	99876	91576	91203	103651	108883	526738	95636	108678	1330207	Various
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**VOCs**													
SB-1	08/27/2020	6.0-7.0	520	200	260	<400	200	7,100	700	230	<70	1,610	3,190	630	2,840	<MDL
	08/27/2020	13.5-14.5	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
SB-2	08/27/2020	5.0-6.0	<70	<70	<70	<400	<100	200	<400	<70	<70	<70	<70	<70	<170	<MDL
SB-3	08/27/2020	4.0-5.0	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
	08/27/2020	8.0-9.0	<60	<60	<60	<300	<100	<100	<300	<60	<60	<60	<60	<60	<160	<MDL
SB-4	08/27/2020	5.0-6.0	70	<70	<70	<300	<100	<100	<300	160	<70	<70	<70	<70	<170	<MDL
SB-5	08/27/2020	4.0-5.0	2,410	800	1,400	1,700	200	3,400	3,300	6,890	160	350	160	640	400	<MDL
SB-6	12/21/2020	10.0-11.0	<80	<80	<80	<400	<200	<200	<400	<80	<80	<80	<80	<80	<280	<MDL
SB-7	12/21/2020	4.0-5.0	38,000	16,000	36,000	20,000	<7,000	45,000	20,000	88,000	<4,000	5,000	<4,000	<4,000	<11000	<MDL
	12/21/2020	7.0-8.0	<70	<70	110	<400	<100	<100	<400	410	<70	70	<70	<70	<170	<MDL
	12/21/2020	14.0-15.0	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
SB-8	12/21/2020	4.0-5.0	<70	<70	<70	<400	<100	<100	<400	<70	<70	<70	<70	<70	<170	<MDL
	12/21/2020	9.0-10.0	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
SB-9	12/21/2020	4.0-5.0	13,800	4,500	1,700	7,000	<2,000	22,000	14,000	29,900	<900	<900	<900	<900	2,000	<MDL
	12/21/2020	10.0-11.0	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
SB-10	12/21/2020	6.5-7.5	<70	<70	<70	<400	<100	<100	<400	<70	<70	<70	<70	<70	<170	<MDL
	12/21/2020	14.0-15.0	<70	<70	<70	<400	<100	<100	<400	<70	<70	<70	<70	<70	<170	<MDL
SB-11	12/21/2020	3.0-4.0	<70	<70	<70	<400	<100	<100	<400	<70	<70	<70	<70	<70	<170	<MDL
	12/21/2020	10.0-11.0	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
SB-12	12/21/2020	6.0-7.0	<70	<70	<70	<400	<100	<100	<400	<70	<70	<70	<70	<70	<170	<MDL
	12/21/2020	10.0-11.0	<60	<60	<60	<300	<100	<100	<300	<60	<60	<60	<60	<60	<160	<MDL
SB-13	12/21/2020	4.0-5.0	<60	<60	<60	<300	<100	<100	<300	<60	<60	<60	<60	<60	<160	<MDL
	12/21/2020	11.0-12.0	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
	12/21/2020	14.0-15.0	<60	<60	<60	<300	<100	<100	<300	<60	<60	<60	<60	<60	<160	<MDL
SB-14	12/21/2020	3.0-4.0	<80	<80	<80	<400	<200	<200	<400	<80	<80	<80	<80	<80	<280	<MDL
	12/21/2020	9.0-10.0	<60	<60	<60	<300	<100	<100	<300	<60	<60	<60	<60	<60	<160	<MDL
SB-15	12/21/2020	3.0-4.0	7,500	3,100	14,600	7,000	<2,000	12,000	13,000	27,500	<800	5,100	2,500	1,200	7,000	<MDL
	12/21/2020	6.0-7.0	210	90	<80	<400	<200	500	1,600	1,500	<80	<80	<80	<80	<280	<MDL
	12/21/2020	14.0-15.0	<60	<60	<60	<300	<100	<100	<300	<60	<60	<60	<60	<60	<160	<MDL
SB-16	12/21/2020	4.0-5.0	2,500	900	<700	<3,000	<1,000	4,000	<3,000	7,700	<700	<700	<700	<700	<1700	<MDL
	12/21/2020	9.0-10.0	<70	<70	<70	<300	<100	<100	<300	<70	<70	<70	<70	<70	<170	<MDL
SB-17	12/21/2020	5.0-6.0	<80	<80	<80	<400	<200	<200	<400	<80	<80	<80	<80	<80	<280	<MDL
	12/21/2020	9.0-10.0	<70	<70	<70	<400	<100	<100	<400	<70	<70	<70	<70	<70	<170	<MDL
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 12, 2020** **EGLE Site-Specific Volatilization to Indoor Air Criteria (SSVIAC), March 21, 2022**																
Residential (µg/Kg)																
Drinking Water Protection (Res DWP)			1,600	1,600	1,500	91,000	NL	57,000	35,000	1,600	16,000	1,800	2,100	1,800	5,600	Various
Groundwater Surface Water Interface Protection (GSIP)			ID	ID	360	3,200	NL	4,200	730	ID	5,400	570	570	1,100	820	Various
Soil Volatilization to Indoor Air Inhalation (Res SVII)			ID	ID	87,000	4.0E+05 {C}	NL	2.70E+06	2.50E+05	ID	3.3E+05 {C}	2.6E+06 {C}	4.3E+06 {C}	2.6E+06 {C}	6.3E+06 {C}	Various
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)			ID	ID	7.20E+05	1.70E+06	NL	1.50E+06	3.00E+05	ID	2.80E+06	1.60E+07	2.10E+07	1.60E+07	4.60E+07	Various
Ambient Air Finite VSI for 5 Meter Source Thickness			ID	ID	1.00E+06	1.70E+06	NL	1.50E+06	3.00E+05	ID	5.10E+06	3.80E+08	5.00E+08	3.80E+08	6.10E+07	Various
Ambient Air Finite VSI for 2 Meter Source Thickness			ID	ID	2.20E+06	2.80E+06	NL	1.50E+06	3.00E+05	ID	1.20E+07	3.80E+08	5.00E+08	3.80E+08	1.30E+08	Various
Ambient Air Particulate Soil Inhalation (Res PSI)			2.00E+09	4.00E+08	1.00E+10	5.80E+09	NL	6.70E+08	2.00E+08	1.30E+09	2.70E+10	8.20E+10	8.20E+10	8.20E+10	2.90E+11	Various
Direct Contact (Res DC)			2.50E+06	2.50E+06	2.2E+07 {C}	2.5E+07 {C}	NL	8.10E+06	1.60E+07	2.50E+06	5.0E+07 {C}	3.2E+07 {C}	3.2E+07 {C}	3.2E+07 {C}	4.1E+08 {C}	Various
Nonresidential (µg/Kg)																
Drinking Water Protection (Nonres DWP)			4,600	4,600	1,500	2.60E+05	NL	1.70E+05	1.00E+05	4,600	16,000	1,800	2,100	1,800	5,600	Various
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)			ID	ID	4.6E+05 {C}	7.3E+05 {C}	NL	4.90E+06	4.70E+05	ID	6.1E+05 {C}	4.8E+06 {C}	8.0E+06 {C}	4.8E+06 {C}	1.2E+07 {C}	Various
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)			ID	ID	2.40E+06	2.00E+06	NL	1.80E+06	3.50E+05	ID	3.30E+06	1.90E+07	2.50E+07	1.90E+07	5.40E+07	Various
Ambient Air Finite VSI for 5 Meter Source Thickness			ID	ID	3.10E+06	2.00E+06	NL	1.80E+06	3.50E+05	ID	3.60E+07	4.60E+08	6.00E+08	4.60E+08	6.50E+07	Various
Ambient Air Finite VSI for 2 Meter Source Thickness			ID	ID	6.50E+06	3.00E+06	NL	1.80E+06	3.50E+05	ID	3.60E+07	4.60E+08	6.00E+08	4.60E+08	1.30E+08	Various
Ambient Air Particulate Soil Inhalation (Nonres PSI)			ID	ID	1.30E+10	2.60E+09	NL	2.90E+08	8.80E+07	5.90E+08	1.20E+10	3.60E+10	3.60E+10	3.60E+10	1.30E+11	Various
Direct Contact (Nonres DC)			8.00E+06	8.00E+06	7.1E+07 {C}	8.0E+07 {C}	NL	2.60E+07	5.20E+07	8.00E+06	1.6E+08 {C}	1.0E+08 {C}	1.0E+08 {C}	1.0E+08 {C}	1.0E+09 {C}	Various
Screening Levels (µg/Kg)																
Soil Saturation Concentration Screening Levels (Csat)			1.00E+07	1.00E+07	1.40E+05	3.90E+05	NL	NA	NA	1.00E+07	2.50E+05	94,000	1.10E+05	94,000	1.50E+05	Various
Residential Site-Specific Volatilization to Indoor Air Criteria (SSVIAC)*			550	3,800	12 (M)	3.8 (M)	NL	1,700	67 (M)	1,800 (DD)	3,700	270 (JT)	150 (JT)	100 (JT)	280 (J)	Various

	Criterion/RBSL Exceeded for Complete Exposure Pathways
BOLD	Exceeds Criterion/RBSL for Complete Exposure Pathways
	Exceeds SSVIAC
underline	SSVIAC Exceeded
bgs	Below Ground Surface (feet)
NA	Not Applicable
NL	Not Listed
ID	Insufficient Data
NLV	Not Likely to Volatilize
NLL	Not Likely to Leach
µg/Kg	Micrograms per Kilogram
*	Residential Volatilization to Indoor Air Criteria (VIAC) apply to a residential house with an elevator shaft that extend 5 feet below grade, with groundwater at a depth of 20.0 feet bgs, and sand soil type.

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
PNAs
3515 2ND AVENUE, DETROIT, MICHIGAN
PM PROJECT #01-12411-1-0001

Polynuclear Aromantic Compounds (PNAs) (µg/Kg)			Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	Other PNAs
Chemical Abstract Service Number (CAS#)			120127	56553	50328	205992	207089	218019	206440	91576	91203	85018	129000	Various
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**PNAs**											
SB-1	08/27/2020	6.0-7.0	<300	<300	<300	<300	<300	<300	<300	700	<300	400	<300	<MDL
	08/27/2020	13.5-14.5	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-2	08/27/2020	5.0-6.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-3	08/27/2020	4.0-5.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	08/27/2020	8.0-9.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-4	08/27/2020	5.0-6.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-5	08/27/2020	4.0-5.0	<300	<300	<300	<300	<300	<300	<300	2,100	2,200	<300	<300	<MDL
SB-6	12/21/2020	10.0-11.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-7	12/21/2020	4.0-5.0	300	<300	<300	<300	<300	<300	<300	6,100	3,200	<300	<300	<MDL
	12/21/2020	7.0-8.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	12/21/2020	14.0-15.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-8	12/21/2020	4.0-5.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	12/21/2020	9.0-10.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-9	12/21/2020	4.0-5.0	<300	<300	<300	<300	<300	<300	<300	7,900	4,800	<300	<300	<MDL
	12/21/2020	10.0-11.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-10	12/21/2020	6.5-7.5	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	12/21/2020	14.0-15.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-11	12/21/2020	3.0-4.0	<300	300	300	500	500	300	600	<300	<300	400	500	<MDL
	12/21/2020	10.0-11.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-12	12/21/2020	6.0-7.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	12/21/2020	10.0-11.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-13	12/21/2020	4.0-5.0	<300	900	800	1,600	1,900	1,000	1,600	<300	<300	700	1,600	<MDL
	12/21/2020	11.0-12.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	12/21/2020	14.0-15.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-14	12/21/2020	3.0-4.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	12/21/2020	9.0-10.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-15	12/21/2020	3.0-4.0	<300	<300	<300	<300	<300	<300	<300	5,500	5,500	<300	<300	<MDL
	12/21/2020	6.0-7.0	<300	<300	<300	<300	<300	<300	<300	<300	1,000	<300	<300	<MDL
	12/21/2020	14.0-15.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-16	12/21/2020	4.0-5.0	<300	<300	<300	<300	<300	<300	<300	2,500	1,600	<300	<300	<MDL
	12/21/2020	9.0-10.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
SB-17	12/21/2020	5.0-6.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL
	12/21/2020	9.0-10.0	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<MDL

Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50)
Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 12, 2020
EGLE Site-Specific Volatilization to Indoor Air Criteria (SSVIAC), March 21, 2022

Residential (µg/Kg)												
Drinking Water Protection (Res DWP)	41,000	NLL	NLL	NLL	NLL	NLL	7.30E+05	57,000	35,000	56,000	4.80E+05	Various
Groundwater Surface Water Interface Protection (GSIP)	ID	NLL	NLL	NLL	NLL	NLL	5,500	4,200	730	2,100	ID	Various
Soil Volatilization to Indoor Air Inhalation (Res SVII)	1.0E+9 {D}	NLV	NLV	ID	NLV	ID	1.0E+9 {D}	2.70E+06	2.50E+05	2.8E+06	1.0E+9 {D}	Various
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)	1.4E+09	NLV	NLV	ID	NLV	ID	7.40E+08	1.50E+06	3.00E+05	1.60E+05	6.5E+08	Various
Ambient Air Finite VSI for 5 Meter Source Thickness	1.4E+09	NLV	NLV	ID	NLV	ID	7.4E+08	1.50E+06	3.00E+05	1.60E+05	6.5E+08	Various
Ambient Air Finite VSI for 2 Meter Source Thickness	1.4E+09	NLV	NLV	ID	NLV	ID	7.4E+08	1.50E+06	3.00E+05	1.60E+05	6.5E+08	Various
Ambient Air Particulate Soil Inhalation (Res PSI)	6.7E+10	ID	1.5E+06	ID	ID	ID	9.3E+09	6.70E+08	2.0E+08	6.7E+06	6.7E+09	Various
Direct Contact (Res DC)	2.3E+08	20,000	2,000	20,000	2.00E+05	2.0E+06	4.6E+07	8.10E+06	1.6E+07	1.6E+06	2.9E+07	Various
Nonresidential (µg/Kg)												
Drinking Water Protection (Nonres DWP)	41,000	NLL	NLL	NLL	NLL	NLL	7.30E+05	1.70E+05	1.00E+05	1.60E+05	4.80E+05	Various
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)	1.0E+9 {D}	NLV	NLV	ID	NLV	ID	1.0E+9 {D}	4.90E+06	4.70E+05	5.1E+06	1.0E+9 {D}	Various
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)	1.6E+09	NLV	NLV	ID	NLV	ID	8.9E+08	1.80E+06	3.50E+05	1.90E+05	7.8E+08	Various
Ambient Air Finite VSI for 5 Meter Source Thickness	1.6E+09	NLV	NLV	ID	NLV	ID	8.8E+08	1.80E+06	3.50E+05	1.90E+05	7.8E+08	Various
Ambient Air Finite VSI for 2 Meter Source Thickness	1.6E+09	NLV	NLV	ID	NLV	ID	8.8E+08	1.80E+06	3.50E+05	1.90E+05	7.8E+08	Various
Ambient Air Particulate Soil Inhalation (Nonres PSI)	2.9E+10	ID	1.9E+06	ID	ID	ID	4.1E+09	2.90E+08	8.8E+07	2.9E+06	2.9E+09	Various
Direct Contact (Nonres DC)	7.3E+08	80,000	8,000	80,000	8.00E+05	8.0E+06	1.3E+08	2.60E+07	5.2E+07	5.2E+06	8.4E+07	Various
Screening Levels (µg/Kg)												
Residential Site-Specific Volatilization to Indoor Air Criteria (SSVIAC)*	1.30E+07	1.60E+05 (MM)	NA	NA	NA	NA	NA	1,700	67 (M)	1,700	2.50E+07	Various

	Criterion/RBSL Exceeded for Complete Exposure Pathways
BOLD	Exceeds Criterion/RBSL for Complete Exposure Pathways
	Exceeds SSVIAC
underline	SSVIAC Exceeded
bgs	Below Ground Surface (feet)
NA	Not Applicable
NL	Not Listed
ID	Insufficient Data
NLV	Not Likely to Volatilize
NLL	Not Likely to Leach
µg/Kg	Micrograms per Kilogram
*	Residential Volatilization to Indoor Air Criteria (VIAC) apply to a residential house with an elevator shaft that extend 5 feet below grade, with groundwater at a depth of 20.0 feet bgs, and sand soil type.

TABLE 3
SUMMARY OF SOIL ANALYTICAL RESULTS
PCBs AND METALS
3515 2ND AVENUE, DETROIT, MICHIGAN
PM PROJECT #01-12411-1-0001

Polychlorinated Biphenyls (PCBs) and Metals (µg/Kg)			PCBs	Cadmium	Chromium	Lead
Chemical Abstract Service Number (CAS#)			1336363	1336363	7440439	16065831
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**PCBs**	**Metals**		
SB-1	08/27/2020	6.0-7.0	<MDL	<200	10,900	10,900
SB-1	08/27/2020	13.5-14.5	<MDL	<200	17,100	6,980
SB-2	08/27/2020	5.0-6.0	<MDL	200	10,800	7,290
SB-3	08/27/2020	4.0-5.0	<MDL	460	16,900	33,800
SB-3	08/27/2020	8.0-9.0	<MDL	<200	14,300	7,830
SB-4	08/27/2020	5.0-6.0	<MDL	<200	13,200	48,300
SB-5	08/27/2020	4.0-5.0	NA	NA	NA	NA
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 12, 2020 EGLE Site-Specific Volatilization to Indoor Air Criteria (SSVIAC), March 21, 2022						
Residential (µg/Kg)						
Statewide Default Background Levels			NA	1,200	18,000	21,000
Drinking Water Protection (Res DWP)			NLL	6,000	30,000	7.00E+05
Groundwater Surface Water Interface Protection (GSIP)			NLL	1.2E+5{G,X}	3,300	1.8E+7{G,X}
Soil Volatilization to Indoor Air Inhalation (Res SVII)			1.2E+03	NLV	NLV	NLV
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)			2.40E+05	NLV	NLV	NLV
Ambient Air Finite VSI for 5 Meter Source Thickness			7.9E+06	NLV	NLV	NLV
Ambient Air Finite VSI for 2 Meter Source Thickness			7.9E+06	NLV	NLV	NLV
Ambient Air Particulate Soil Inhalation (Res PSI)			5.2E+06	1.70E+06	2.60E+05	1.0E+08
Direct Contact (Res DC)			4,000 {T}	5.50E+05	2.50E+06	4.00E+05
Nonresidential (µg/Kg)						
Drinking Water Protection (Nonres DWP)			NLL	6,000	30,000	7.00E+05
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)			1.6E+07	NLV	NLV	NLV
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)			8.10E+05	NLV	NLV	NLV
Ambient Air Finite VSI for 5 Meter Source Thickness			2.8E+07	NLV	NLV	NLV
Ambient Air Finite VSI for 2 Meter Source Thickness			2.8E+07	NLV	NLV	NLV
Ambient Air Particulate Soil Inhalation (Nonres PSI)			6.5E+06	2.2E+06	2.40E+05	4.4E+07
Direct Contact (Nonres DC)			16,000 {T}	2.1E+06	9.20E+06	9.00E+05 (DD)
Screening Levels (µg/Kg)						
Soil Saturation Concentration Screening Levels (Csat)			NA	NA	NA	NA
Residential Site-Specific Volatilization to Indoor Air Criteria (SSVIAC)*			NA	NLV	NLV	NLV

	Criterion/RBSL Exceeded
BOLD	Exceeds Criterion/RBSL
	Exceeds SSVIAC
underline	SSVIAC Exceeded
bgs	Below Ground Surface (feet)
NA	Not Applicable
NL	Not Listed
NLV	Not Likely to Volatilize
µg/Kg	Micrograms per Kilogram
{G}	Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 102 mg/L CaCO3 Hardness: Station ID 000025, Detroit River at Range 3.9, Off Bar Point, in Detroit, MI.
*	Residential Volatilization to Indoor Air Criteria (VIAC) apply to a residential house with an elevator shaft that extend 5 feet below grade, with groundwater at a depth of 20.0 feet bgs, and sand soil type.

TABLE 4
SUMMARY OF SOIL GAS ANALYTICAL RESULTS
VOCs
3515 2ND AVENUE, DETROIT, MICHIGAN
PM PROJECT #01-12411-1-0001

Volatile Organic Compounds (VOCs) (µg/m^3)			Acetone	Benzene	Cyclohexane	Ethanol	Ethylbenzene	4-Ethyltoluene	Heptane	Hexane	2-Hexanone	Methyl ethyl ketone	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2,2,4-Trimethylpentane	Tetrachloroethylene	Tetrahydrofuran	Toluene	Xylenes (total)	Other VOCs
Chemical Abstract Service Number (CAS#)			67641	71432	110827	64175	100414	622968	142825	110543	591786	78933	95636	108678	540841	127184	109999	108883	1330207	Various
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**VOCs**																	
SG-1	08/27/2020	5.0	<810	**480**	6,200	<810	**480**	<150	8,440	3,500	<370	<500	<150	<150	<1,170	<200	<88	1,300	3,500	<MDL
SG-3	08/27/2020	5.0	330	32	130	85	100	84	330	100	45	440	230	93	140	34	15	170	1,140	<MDL
SG-5	08/27/2020	5.0	<3,600	<640	125,000	<3,600	**13,000**	<980	**210,000**	**234,000**	<1,600	<2,200	<980	<980	**214,000**	<1,400	<590	<750	<2,200	<MDL
EGLE Site-Specific Volatilization to Indoor Air Criteria (SSVIAC), March 21, 2022																				
EGLE VIAP Screening Levels (µg/m3)																				
Residential Soil Vapor VIAP Screening Level			1.0E+06	110	210,000	630,000	340	NL	120,000	24,000	1,000	170,000	2,100	2,100	120,000	1,400	70,000	170,000	7,600	Various

	SSVIAC Exceeded
BOLD	Value Exceeds SSVIAC
<MDL	Not detected at or above laboratory reporting or detection limits
bgs	Below Ground Surface
(µg/m^3)	micrograms per cubic meter
NL	Not Listed
*	Residential Volatilization to Indoor Air Criteria (VIAC) apply to a residential house with an elevator shaft that extend 5 feet below grade, with groundwater at a depth of 20.0 feet bgs, and sand soil type.

Appendix A

PM ENVIRONMENTAL Environmental & Engineering Services

3515 SECOND 48201 (Property Address)

Parcel Number: 04000689-90

Item **1** of **12** 12 Images / 0 Sketches

Property Owner: BAZZI, JAMAL

Summary Information

> Assessed Value: $366,800 | Taxable Value: $66,885

> Property Tax information found

Owner and Taxpayer Information

Owner	BAZZI, JAMAL 27030 DOXTATOR DEARBORN HEIGHTS, MI 48127	**Taxpayer**	SEE OWNER INFORMATION

General Information for Tax Year 2020

Property Class	202-COMMERCIAL VACANT	**Unit**	01 CITY OF DETROIT
School District	DETROIT PUBLIC SCHOOLS	**Assessed Value**	$366,800
WARD#	04	**Taxable Value**	$66,885
DISTRICT	4	**State Equalized Value**	$366,800
ASMT CODE	*Not Available*	**Date of Last Name Change**	05/24/2017
RELATED #	*Not Available*	**Notes**	*Not Available*
Historical District	*Not Available*	**Census Block Group**	*Not Available*
COUNCIL #	*Not Available*	**Exemption**	*No Data to Display*

Principal Residence Exemption Information

Homestead Date *No Data to Display*

Principal Residence Exemption	June 1st	Final
2020	0.0000 %	0.0000 %

Land Information

Zoning Code	SD2	**Total Acres**	0.356
Land Value	$733,600	**Land Improvements**	$0
Renaissance Zone	No	**Renaissance Zone Expiration Date**	*No Data to Display*
ECF Neighborhood	*Not Available*	**Mortgage Code**	*No Data to Display*
Lot Dimensions/Comments	*Not Available*	**Neighborhood Enterprise Zone**	No

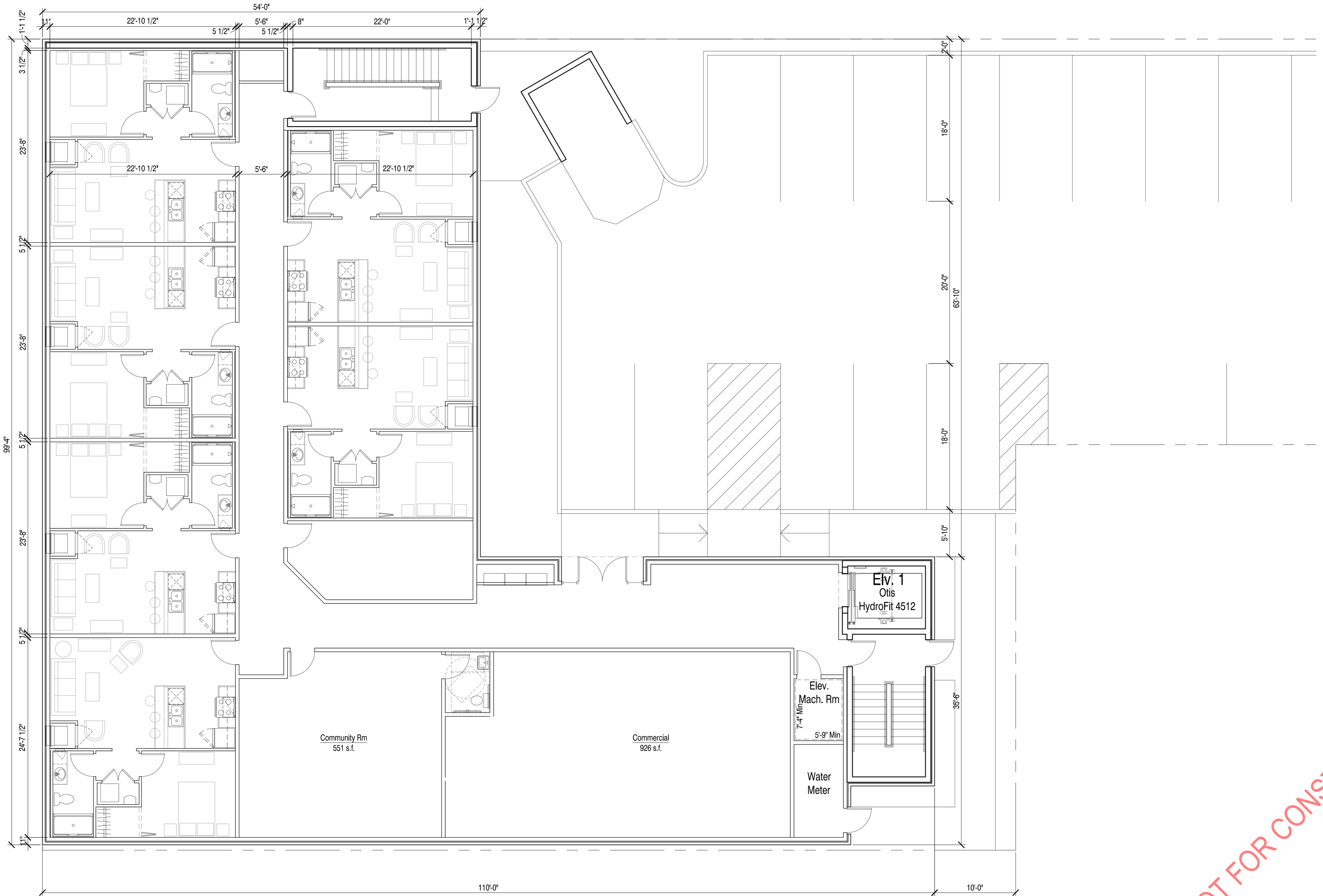
Lot(s)	Frontage	Depth
Lot 1	100.00 ft	155.00 ft
	Total Frontage: 100.00 ft	**Average Depth: 155.00 ft**

Legal Description

N MYRTLE 18 S 120 FT 17 BLK 90 CASS FARM SUB L1 P175-7 PLATS, W C R 4/34 100 IRREG

Sale History

Sale Date	Sale Price	Instrument	Grantor	Grantee	Terms of Sale	Liber/Page
04/15/2017	$300,000.00	WD	WEATHERLY, JEREMIAH & ADDIE	BAZZI, JAMAL	VALID ARMS LENGTH	2017170245
06/19/2004	$0.00	PTA	LUDY, QUINON	WEATHERLY, JEREMIAH	NO CONSIDERATION	



1 A1.1 Ground Floor Plan

Scale: 3/16" = 1'-0"

N

NOT FOR CONSTRUCTION

SHELTER
DESIGN STUDIO LLC

104 W. Fourth Street
Suite 303
Royal Oak, Michigan 48067

248.629.7153 ph.
248.629.7154 fax

www.SHELTERSTUDIOLLC.com

Architect of Record

Owner

MHT HOUSING, INC.
32600 Telegraph Road, Ste 102
Bingham Farms, MI 48025

Project

New Apartments
SECOND AVENUE APARTMENTS

3515 Second Ave
Detroit, MI 48201

1"=1'-0" 1/2"=1'-0" 1/8"=1'-0"
3" 3/8"=1'-0" 0"
1 1/2"=1'-0" 3/4"=1'-0" 1/4"=1'-0"

Issued For	Date
Preliminary	09.13.2021

Drawing Title

Ground Floor Plan

2021-249
Project No.

JMH	SGP
Drawn By	Checked By

Scale

A1.1
Drawing No.

1 A1.2 — 2nd - 4th Floor Plans
Scale: 3/16" = 1'-0"

N

NOT FOR CONSTRUCTION

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Issued For	Date
Preliminary	09.13.2021

Drawing Title
2nd - 4th Floor Plan

2021-249
Project No.

JMH	SGP
Drawn By	Checked By

Scale
A1.2
Drawing No.

Appendix B

PM ENVIRONMENTAL Environmental & Engineering Services

Phase I Environmental Site Assessment
3515 2nd Avenue
Detroit, Michigan

MHT Housing, Inc.

April 7, 2020

ASTI ENVIRONMENTAL

ASTI ENVIRONMENTAL

SECTION IX **2020 MSHDA PHASE I SUMMARY COVER SHEET**

Project Name:			
Project Address:	3515 2nd Avenue, Detroit, Michigan		
Sponsors Name:	Jen Liddell	Sponsor E-mail:	jliddell@mhthousing.net
Consulting Firm:	ASTI Environmental		
Consultant Phone:	(810) 225-2800	E-mail:	pchapman@asti-env.com
Consultant Project #:	11469	Report Date:	April 7, 2020

Additional Site Info (please complete if known)

Site area:	(in acres)	# Units planned:	25
Vacant land:	☒	Developed:	☐
If developed, # existing buildings:			
Vacant Structure(s):	☐	# vacant	
Date(s) of construction for existing structures:			
Single Site:	☒	Scattered sites:	☐
If scattered, # sites:			
Rehab of existing structure(s):	☐	New Construction with planned demolition of existing structure(s):	☐
Adaptive Re-Use:	☐	New Construction without planned demolition of existing structure(s):	☐
No physical changes planned:	☐	Comments:	

Please answer all questions below, noting the appropriate page or appendix in your report that contains the supporting documentation. **Summary Cover Sheets containing unknown or incomplete responses will not be processed and will be returned for correction.**

REPORT FINDINGS

a. **RECs** - The Phase I ESA revealed a REC(s). ☒ Yes ☐ No (See Sec. IV) Page. 2

b. The site contains a **wetland** area(s). ☐ Yes ☒ No (See Sec. IV, H.5) Page. 31

c. The site or a portion of the site is in the **Special Flood Hazard Area**.
☐ Yes ☒ No (See Sec. IV, H.4) Page. 31

d. The site contains a **UST(s)**. ☒ Yes ☒ No (See Sec. IV, I)
See pages 24-25 (USTs previously existed on site, but may have been removed during demolition of the prior building.

e. This site contains a **AST(s)**. ☐ Yes ☒ No (See Sec. IV, H.10) Page. 33

e. **EMF** - There are high power electrical transmission lines within 500 feet of the subject site.
☐ Yes ☒ No (See Sec. IV, H.6) Page. 31

f. **HP GAS** - There are buried high-pressure gas transmission lines (4" in diameter and 400 psi or greater) within 1000 feet of the subject site. ☐ Yes ☒ No (See Sec. IV, H.7) Page. 31

g. **NOISE -** The subject site is near a busy roadway or within 1000 feet of a limited access freeway or 3000 feet of a rail line, or within 15 miles of an airport.

☒ Yes ☐ No Page. 31

Was a noise assessment performed?

☒ Yes ☐ No (See Sec. IV, H.8) (Appendix 10.7)

h. **ASBESTOS** - A NESHAP-compliant asbestos survey is required for every MSHDA renovation/remodeling project, regardless of the date of construction. Was a NESHAP-compliant asbestos survey performed for this renovation/remodeling project?

☐ Yes ☒ No Page. 31

If Yes, were any asbestos containing materials (ACM) identified?

☐ Yes ☐ No (See Sec. IV, H.1)

i. **LEAD** - For structures built before January 1, 1978, a combination lead Risk Assessment/Inspection satisfying state and federal requirements is required. Was a combination lead Risk Assessment/Inspection performed?

☒ Not required (*Post-1977 Date of Construction*) ☐ Yes ☐ No Page. 31

If Yes, was Lead Based Paint identified? ☐ Yes ☐ No (See Sec. IV, H.2)

j. **RADON -** For developments in Michigan counties where 25% or more homes tested equal to or above the EPA action level of 4 pCi/L, as depicted by the Michigan EGLE radon map (*Barry, Berrien, Branch, Calhoun, Cass, Clinton, Dickinson, Easton, Hillsdale, Ionia, Iron, Jackson, Kalamazoo, Lapeer, Lenawee, Livingston, Monroe, Oakland, Otsego, Ottawa, St. Joseph, Shiawassee, Tuscola and Washtenaw*) was a radon assessment conducted by a Radon Professional was performed?

☒ Not required: Not in >25% county. ☐ Yes ☐ No Page. 31

If Yes, was Radon above EPA action level? ☐ Yes ☐ No (See Sec. IV, H.3)

k. A "Recorded Land Records" search was performed? ☒ Yes ☐ No (See Sec. IV, C) Page. 11

l. A Phase II investigation is required? ☒ Yes ☐ No (See Sec. V) Page. 26

m. A Tier I and non-invasive Tier II Vapor Encroachment Screen were preformed?

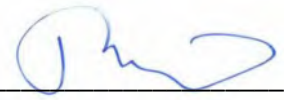
☒ Yes ☐ No (See Sec. IV, H.9) Page. 32

If yes, was a **Vapor Encroachment Condition (VEC)** identified and an invasive Tier II investigation is recommended. ☒ Yes ☐ No (See Sec. IV, H.9) Page. 32

2. Report Documentation Check List. If any of the responses below are "NO," do not submit report.

a. MSHDA Phase I Letter of Reliance completed?	☒ Yes	☐ No
b. User's Disclosure Statement completed?	☒ Yes	☐ No
c. Compliant ACORD 25 Certificate of insurance included?	☒ Yes	☐ No
d. FEMA Flood Plain Map Included?	☒ Yes	☐ No
e. Fire Insurance Maps or No Coverage Letter Included?	☒ Yes	☐ No
f. Development Site Plan Included?	☒ Yes	☐ No
g. Site boundaries indicated on all maps and photos?	☒ Yes	☐ No
h. CD or flash drive (PDF versions) included?	☒ Yes	☐ No

I represent that this Summary Cover Sheet accurately reflects the environmental information contained in the above captioned document.



Signature of Environmental Professional	Date	Print or Type Legal Name
_____/	April 6, 2020	Pam Chapman, PE, EP

Phase I Environmental Site Assessment
3515 2nd Avenue
Detroit, Michigan

April 7, 2020

Report Prepared For:

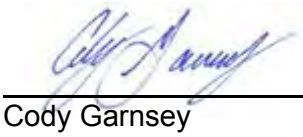
MHT Housing, Inc.
32600 Telegraph Road, Suite 102
Birmingham Farms, Michigan
and
Michigan State Housing Development Authority
735 E. Michigan Avenue
Lansing, Michigan 48912

Report Prepared By:

ASTI Environmental
10448 Citation Drive, Suite 100
Brighton, Michigan 48116
1-800-395-ASTI

ASTI Project No. 11469

Report Prepared by:



Cody Garnsey
Associate I

Report Reviewed by:

Pam Chapman, PE, EP
Phase I Group Leader

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ASTI ENVIRONMENTAL

1.0 EXECUTIVE SUMMARY

ASTI Environmental (ASTI) was retained by MHT Housing, Inc. to conduct a Phase I Environmental Site Assessment (ESA) of 3515 2nd Avenue in Detroit, Wayne County, Michigan (Subject Property). The Phase I ESA was conducted in accordance with American Society for Testing and Materials (ASTM) Practice E1527-13 and the Michigan State Housing Development Authority (MSHDA) Environmental Review Requirements for 2020. The information and opinions rendered in this report are exclusively for reliance by MHT Housing, Inc. and MSHDA, and ASTI will not distribute or publish this report without the consent of MHT Housing, Inc., except as required by law or court order. The services provided by ASTI in completing this assessment have been provided in a manner consistent with the normal standards of the profession. No other warranties, expressed or implied, are made.

The Phase I ESA included (1) a site inspection on March 26, 2020, (2) interviews with knowledgeable site contacts, (3) review of pertinent Michigan Department of Environment, Great Lakes, and Energy (EGLE), Department of Licensing and Regulatory Affairs (LARA), Wayne County, and Detroit information, (4) acquisition and review of a federal and Michigan database search, (5) review of historical aerial photographs, Sanborn maps, and city directories, and (6) FEMA Map search, National Wetlands Inventory map review, and Noise Assessment.

No testing or sampling of materials (for example, soil, water, and air) was included in this assessment. No limiting conditions were identified during the site reconnaissance, except for those described in Section 6.1. The temperature was approximately 50°F and overcast.

1.1 Summary and Conclusions

A detailed summary of the findings of this Phase I ESA can be found in Section 8.1.

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 and MSHDA requirements of 3515 2nd Avenue in Detroit, Wayne County, Michigan, referred to as the “Subject Property”. Any exceptions to, or deletions from, this practice are described in Section 5.4 of this report. This assessment has revealed no evidence of recognized environmental conditions (RECs) in connection with the Subject Property, except for the following.

- The Subject Property operated a gasoline filling station from at least 1926 to 1977 before modern leak/release detection systems were common to detect compromised USTs and piping. Additionally, based on the nature of gasoline filling station operations, a release may have occurred from chronic over filling over an extended period.

- From at least 1967 to 1995, in addition to gasoline filling operations, the site operated as a tire and battery service and/or automobile service shop and used car sales lot with unknown materials management practices.

- At least two gasoline USTs were used at the Subject Property. Additional USTs may be present on-site.

- The southern adjoining property of 631 Martin Luther King Jr. Boulevard is identified as a BEA site. BEA sites are known to contain concentrations of contamination in excess of the most restrictive EGLE GRCC. Since EGLE records were not obtained and reviewed prior to completion of this assessment and based on the proximity of the site, the site is considered a REC for the Subject Property.

Significant Data Gaps

The southern adjoining property of 631 Martin Luther King Jr. Boulevard is identified as a BEA site. ASTI requested a copy of the BEA and associated documents from EGLE, but records were not obtained and reviewed prior to completion of this assessment. The inability to review these records is considered a significant data gap. Based on the proximity of the site, and the nature of BEA sites, the site is considered a REC for the Subject Property.

The City of Detroit Assessing, Building, and Fire Department records were not available for review due to the recent municipal office closures as a result of the Covid-19 virus. Municipal records may contain information regarding prior USTs associated with the prior gasoline filling operations on the Subject Property. Reviewing these records at a later date could alleviate this data gap.

The foundations of previous buildings may include basements. Fill material could have been required to return to grade any potentially resulting cavities, and the source of the fill is

unknown. The type of backfill and grading materials used prior to stricter permitting regulations commonly included demolition materials and/or industrial by-products. Historic fill materials often contained hazardous substances and/or petroleum products. If demolition debris is encountered, asbestos containing materials may be present.

1.2 Data Failure Points

Refer to Section 8.4 for a discussion regarding data failures and/or data gaps encountered during the investigation.

1.3 Identified Liens or Activity Use Limitations

The EGLE Remediation and Redevelopment Division (RRD) maintains a list of properties that have perfected environmental liens on file with the EGLE. The Subject Property was not on the list as of the last update dated October 11, 2019 (Appendix 10.5).

Based on a review of the government records search for the Subject Property provided from EDR and information provided on the User Questionnaire, there are no activity and use limitations (AULs) against the Subject Property.

2.0 INTRODUCTION

ASTI Environmental (ASTI) was retained by MHT Housing, Inc. to conduct a Phase I Environmental Site Assessment (ESA) of 3515 2nd Avenue in Detroit, Wayne County, Michigan (Subject Property). The Phase I ESA was conducted in accordance with the American Society for Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (E1527-13), 40 CFR Part 312: Standards and Practice for All Appropriate Inquiries; Final Rule (AAI), and the Michigan State Housing Development Authority (MSHDA) Environmental Review Requirements for 2020.

2.1 Purpose

The assessment was conducted to identify *recognized environmental conditions,* (RECs), *historical recognized environmental conditions* (HRECs), and *controlled recognized environmental condition*s (CRECs) associated with the historical uses of the Subject Property, current site operations, and the condition of surrounding properties. ASTI understands that the findings of this study will be used for a LIHTC submittal to MSHDA. This Phase I ESA can be also used by MHT Housing, Inc. to qualify for one of three landowner liability protections (contiguous property owner, innocent landowner, or bona fide prospective purchaser) available under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended, and may also be used to qualify for State of Michigan liability defenses and exemption that may be available under Part 201 of the Natural Resources and Environmental Protection Act.

According to ASTM Practice E1527-13, the term *recognized environmental condition* is defined as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

2.2 Detailed Scope of Services

Information required to complete the ESA was obtained from personal interviews and review of practically reviewable and reasonably ascertainable records. Informational sources include the following:

- User's Environmental Questionnaire;
- Key Site Manager;
- Department of Environment, Great Lakes, and Energy (EGLE);
- EGLE Perfected Environmental Liens (10-11-19);
- Department of Licensing and Regulatory Affairs (LARA);
- Available records maintained by the City of Detroit and Wayne County;
- The EDR Radius Map Report with GeoCheck (3-18-20);
- Aerial photographs;
- Sanborn maps;
- City directories;
- Noise Assessment;
- Acceptable separation distance calculations;
- U.S. DOT National Pipeline Mapping System Map;
- FEMA; and
- U.S. Fish and Wildlife Service NWI Map.

Mr. Anthony Spencer, Environmental Professional, inspected the Subject Property on March 26, 2020. Mr. Cody Garnsey, Project Manager, and Ms. Pam Chapman, PE, Environmental Professional, completed report preparation. Copies of Mr. Spencer's, Mr. Garnsey's, and Ms. Chapman's resumes are provided in Appendix 10.8.

2.3 Significant Assumptions

Information obtained during this assessment, to the extent it was relied on to form our opinion, was assumed to be complete and accurate. ASTI cannot be held responsible for the quality or content of information obtained from interviews and standard sources. Since ASTI cannot warrant or guarantee that the information provided by interviews and standard sources is accurate or complete, the intention of this Phase I ESA is to reduce, but not eliminate, uncertainty for the potential for RECs, HRECs, and CRECs on the Subject Property.

2.4 Limitations and Exceptions

The information and opinions included in this report were given in response to a limited scope of work being a Phase I ESA per ASTM Practice E1527-13 and MSHDA Environmental Review Requirements for 2020, and should be considered and implemented only in light of that particular scope of work. The services provided by ASTI in completing this assessment have been provided in a manner consistent with the normal standards of the profession. No other warranties, expressed or implied, are made.

No testing or sampling of materials (for example, soil, water, and air) was included in this assessment. No limiting conditions were identified during the site reconnaissance, except for those described in Section 6.1. The temperature was approximately 50°F and overcast.

Responses received from regulatory agencies or other secondary sources of information after the issuance of this report may alter the facts, findings, conclusions, or recommendations to this ESA.

2.5 Special Terms and Conditions

The Phase I ESA was performed in conformance with the scope and limitations of ASTM Practice E1527-13, AAI, and MSHDA Environmental Review Requirements for 2020. No special terms and conditions outside ASTM Practice E1527-13, AAI, and MSHDA Requirements have been addressed. Under the AAI Rule and ASTM Practice E1527-13, all appropriate inquiries must be conducted within one year prior to the date of transaction of the Subject Property. However, certain components of the all appropriate inquiries (interviews, liens searches, records review, and visual inspections) must be conducted or updated within 180 days prior to the date of the Subject Property transaction.

2.6 User Reliance

The Phase I ESA was performed for the benefit of MHT Housing, Inc. and MSHDA, and ASTI acknowledges that said parties may rely on the contents and conclusions presented in this report. ASTI acknowledges the fact that the scope of work was sufficient in ASTI's opinion to uncover, to the extent of ASTI's services, potential environmental liabilities at the Subject Property.

This effort was performed per authorization of MHT Housing, Inc. on March 17, 2020. The information and opinions rendered in this report are exclusively for use by MHT Housing, Inc. and MSHDA. ASTI will not distribute or publish this report without the consent of MHT Housing, Inc., except as required by law or court order.

Any use a third party makes of this report, or any reliance upon it, or any decisions based on it, is the sole responsibility of the third party. A third party is not afforded the status of a third-party beneficiary unless ASTI expressly agrees to such status in writing. ASTI has no responsibility for any damages that may be suffered by a third party as a result of any decision made, or action taken by a third party, based on this report.

3.0 SITE DESCRIPTION

3.1 Location and Legal Description

General Location	A Site Location Map is provided in Appendix 10.1.
Section, Township and Range	This land has been in private ownership since before Michigan joined the United States. It is therefore not part of the Township and Range system, which was a survey of federal lands.
City/Township, County, State Zip Code	Detroit, Wayne County, Michigan 48201
Parcel Number(s)	04000689-90

Current assessing records with parcel legal descriptions are included in Appendix 10.5.

3.2 Site and Vicinity General Characteristics

Subject Property Zoning	SD-2 (mixed zoning)
Local Development Utilization	Mixed-commercial

A Site Features Map is included in Appendix 10.2. Photographs of the Subject Property and adjoining properties were taken during the site inspection and are provided as Appendix 10.3.

3.3 Current Use of the Subject Property

The Subject Property is currently vacant land.

3.4 Descriptions of Structures, Roads, Other Improvements on the Site

Below is summary of the Subject Property improvements.

Roads and Other Improvements	
Access	Available from nearby roadways.
Paved Areas	Paved areas are present on the east portion of the Subject Property.
Maintained Lawn	Present on the north portion.
Landscaped Areas	None
Surface Water	None

Municipal Services and Utilities			
Service or Utility	**Present**	**Provider**	**Comments**
Potable Water Source	Hook-up available	City of Detroit	
Irrigation Well	No		
Sewage	Hook-up available	City of Detroit	
Storm Sewer	Yes	City of Detroit	
Electrical	Hook-up available		
Natural Gas	Hook-up available		
Solid Waste Disposal	No		
Heating & Cooling	No		

There was no indication or evidence of the former presence of potable wells or septic systems on the Subject Property. A current or prior heating source other than natural gas has not been identified through a review of reasonably ascertainable records.

3.5 Current Uses of Adjoining Properties

ASTI observed adjoining properties during the inspection to evaluate the potential risk these properties may pose to the Subject Property.

Adjoining Property Use			
Direction from Property	**Occupant & Address**	**Use**	**Potential Concerns Observed During Site Reconnaissance**
North	Apartments 651 Brainard Street	Residential	None
South	Vacant 3469 2nd Avenue	Vacant parcel	None
	Woodward Corridor Family Medical Center 631 Martin Luther King Jr. Boulevard	Medical center	None
East	Residential 3525-3531 2nd Avenue	Residential	None
	Vacant land 3522-3514 2nd Avenue	Vacant land	None
	Vacant building 3500 2nd Avenue	Vacant building	None
West	People United as One Apartments 660 Myrtle Street	Apartments	None

4.0 USER PROVIDED INFORMATION

In order to qualify for one of the landowner liability protections offered by the Small Business Liability Relief and Brownfield's Revitalization Act of 2002, the User, defined by ASTM as *the party seeking to use Practice E1527 to complete an environmental site assessment of the Subject Property*, has specific obligations for completing a successful application of this practice as outlined in Section 6 of ASTM E1527-13 Failure to provide information regarding the obligations outlined to the Environmental Professional may result in a determination that AAI is not complete.

Mr. T. Van Fox representing MHT Housing, Inc., completed a User's Questionnaire. A copy of the User's Questionnaire is provided in Appendix 10.6.

4.1 Title Records

A title search was not included in the scope of this Phase I ESA based on prior use identified through other historical resources.

4.2 Environmental Liens or Activity and Use Limitations

The User representative was not aware of any environmental liens or activity and land use limitations.

4.3 Specialized Knowledge

The User representative does have specialized knowledge or experience related to the Subject Property or nearby properties. The User is aware adjoining sites are multi-family housing and the Subject Property is currently vacant land.

4.4 Commonly Known or Reasonably Ascertainable Information

The User representative does not have any commonly known or reasonably ascertainable information indicative of releases or threatened releases on the Subject Property.

4.5 Valuation Reduction for Environmental Issues

According to The User representative, the purchase price represents the fair market value.

4.6 Owner, Property Manager, and Occupant Information

The Subject Property is privately owned and is not occupied.

4.7 Reason for Performing Phase I ESA

ASTI understands that the findings of this study will be used for a LIHTC submittal to MSHDA. This Phase I ESA can be also used by MHT Housing, Inc. to qualify for one of three landowner liability protections (contiguous property owner, innocent landowner, or bona fide prospective purchaser) available under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended, and may also be used to qualify for State of Michigan liability defenses and exemption that may be available under Part 201 of the Natural Resources and Environmental Protection Act.

4.8 Other

Ms. Jennifer Liddell of MHT Housing (User) stated the Owner of the property had demolished the prior building and removed onsite USTs with permits. Provided permits included a wrecking permit, a water disconnection notice, and a document that indicated an asbestos survey may have been conducted prior to demolition. No documents regarding the removal of the USTs were provided. It is unknown if the verification sampling was conducted during removal of the USTs to determine whether a release had occurred.

5.0 RECORDS REVIEW

5.1 Standard Environmental Record Sources

ASTI ordered a government records search for the Subject Property from Environmental Data Resources, Inc. (EDR) in Shelton, Connecticut. A copy of The EDR Radius Map Report with GeoCheck dated March 18, 2020, is included in Appendix 10.5. A description of the databases, search distances, and results are presented in the report.

ASTM-Required Databases			
Database List (ASTM Required Search Distance)	**Subject Property Listing**	**Adjoining Property Listing**	**Total Applicable ASTM Listings**
Federal NPL/State Hazardous Waste Site (1 mile)	No	No	0
Delisted NPL (0.5 mile)	No	No	0
Federal/State/Tribal Equivalent SEMS (0.5 mile)	No	No	1
Federal SEMS Archive (0.5 mile)	No	No	0
Federal RCRA CORRACTS (1 mile)	No	No	0
Federal TSD Facility (0.5 mile)	No	No	0
Federal RCRA Generator (Subject Property/Adjoining)	No	No	0
Federal Inst./Eng. Controls (Subject Property only)	No	No	0
Federal ERNS (Subject Property Only)	No	N/A	0
State/Tribal Landfill or Solid Waste Facility (0.5 mile)	No	No	0
State/Tribal LUST (0.5 mile)	No	No	35
State/Tribal Registered UST (Subject Property/Adjoining Properties)	No	No	0
State/Tribal Inst./Eng. Controls (Subject Property only)	No	N/A	0
State/Tribal Voluntary Cleanup Sites (0.5 mile)	No	No	0
State/Tribal Brownfield Sites (0.5 mile)	No	No	5

Refer to the EDR report Executive Summary for abbreviation descriptions.

Supplemental Databases Selected by Environmental Professional			
Supplemental Database List Name (ASTI Search Distance)	**Subject Property Listing**	**Adjoining Property Listing**	**Additional Listings in Search Distance**
State/Tribal - Part 201 (1 mile)	No	No	4
Michigan Baseline Environmental Assessment (BEA) Sites ($^1/_{10}$ mile)	No	Yes	2
Historical Auto Stations ($^1/_{10}$ mile)	Yes (1)	Yes (1)	7
Dry Cleaners/Historical Cleaners ($^1/_{10}$ mile)	No	No	10
Additional Non-ASTM Databases (Subject Property or Adjoining Property)	Yes	No	N/A
Orphans	No	No	0

Discussion of Subject Property Listings

The Subject Property is identified as a Historical Auto and WDS listing under the address 3515 2nd Avenue. The historical auto listing references the site as an Earl S Standard Super Service gasoline station in 1965. The WDS listing identifies the Subject Property address as a H & R Auto Service. The WDS listing did not identify any violations for the Subject Property. Refer to Section 8.1 for further discussion regarding operations of a gasoline service station and/or auto service.

Discussion of Off-Site Listings of Environmental Concern

Adjoining property listings are discussed below. For the remaining listings, ASTI considers select criteria to determine which listings represent an environmental concern to the Subject Property. The criteria include but are not limited to the following.

- Database type
- Topography relative to the Subject Property
- Direction and distance
- Soil profile identified in available sources
- Known or inferred groundwater depth and flow direction
- Status of applicable investigation
- Surface and subsurface conditions including but not limited to buildings, pavement, utility corridors, and surface water features
- Potable water source (well or municipal)

An evaluation of these criteria is completed to determine the level of risk associated with each listing. Listings with likely releases that are found to have the potential to represent an

elevated or high risk are requested through FOIA to applicable agencies.

Using the referenced criteria and based upon the information contained within the EDR report, ASTI did not identify any additional listings beyond adjoining properties that were considered to represent an elevated or high risk to the Subject Property.

Site Name	Koester's Laundromat
Databases Listing(s)	EDR Historical Cleaner
Location	3562 2nd Avenue
Distance and Direction	+/- 181 feet northeast
Documentation Requested	• *None*
Summary of Findings	According to Sanborn maps, the site operated as a laundromat from at least 1950 to 1988. The site exists +/- 181 feet northeast across 2nd Avenue. Based on distance from the Subject Property and the site existing cross-gradient, the site is not considered a REC.

Site Name	Ideal Laundry and Cleaners
Databases Listing(s)	EDR Historical Cleaner
Location	3534 2nd Avenue
Distance and Direction	+/- 121 feet northeast
Documentation Requested	• *None*
Summary of Findings	According to the EDR Report, the site operated as a laundry and cleaner in at least 1965. Based on distance from the Subject Property and the site existing cross-gradient, the site is not considered a REC.

Site Name	Detroit Medical Center
Databases Listing(s)	BEA
Location	2nd Avenue and Myrtle
Distance and Direction	+/- 66 feet south
Documentation Requested	• RRD: Remediation and Redevelopment Division of the EGLE • MMD: Materials Management Division of the EGLE
Summary of Findings	ASTI requested a copy of the BEA and other records for the site from EGLE. Records were not provided prior to completion of this report. Based on the nature of BEA sites known to contain contamination above state levels, and the proximity to the

	Subject Property, the site is considered a REC for the Subject Property. The inability to review EGLE records for the property is considered a significant data gap.

5.2 Additional Environmental Record Sources

Michigan Oil and Gas Wells

Based on a review of the EGLE GeoWebFace search system and EDR report, no oil or gas wells were identified on or adjoining to the Subject Property.

County and Local Records Review

ASTI requested information for the Subject Property from the Wayne County Health Division. A response was not received prior to completion of this report. Refer to Section 8.4.

ASTI requested information for the Subject Property from the Detroit Fire Department. A response was not received prior to completion of this report. Refer to Section 8.4.

ASTI requested information for the Subject Property from the Detroit Assessing Department. A response was not received prior to completion of this report. Refer to Section 8.4. Due to recent municipal office closure as a result of the Covid-19 virus, ASTI was unable to inspect records in person. Online assessing information was obtained and reviewed (Appendix 10.5). Records showed a picture of the prior building which had over head doors indicative of buildings associated with auto repair operations.

ASTI requested information for the Subject Property from the Detroit Building Department A response was not received prior to completion of this report. Refer to Section 8.4. Due to recent municipal office closure as a result of the Covid-19 virus, ASTI was unable to inspect records in person.

5.3 Physical Setting Sources

A Physical Setting Sources Map, which includes an overlay of the United States Geological Survey (USGS) topographic map (7.5-minute series) for the Detroit, Michigan, quadrangle, which includes the Subject Property, is provided in the EDR report in Appendix 10.5. The USGS map is also the basis of the Site Location Map in Appendix 10.1.

Average Elevation (feet above mean sea level)	616
Local Gradient	Local topography is considered relatively flat.
Regional Gradient	The topography of the regional area declines to the southeast.
Nearest Surface Water Body	Detroit River +/- 1.8 miles south.
Groundwater Depth	Groundwater could not be reasonably estimated with available information.
Groundwater Flow Direction	Inferred to flow southeast in accordance with regional gradient.

Soil composition information for the Subject Property is included in the EDR report (Appendix 10.5). The soil component for the Subject Property is described as follows.

Soil Component	Soil Texture	Infiltration Rate	Drainage	Hydric
Urbanland	Variable	Not reported	Not reported	Not reported

According to the DEQ/EGLE GeoWebFace website, quaternary geology on the Subject Property consists of silt and clay from a lacustrine depositional environment.

5.4 Historical Use Information on the Subject Property

Reasonably ascertainable standard historical sources as found in Section 8.3.4 of ASTM Practice E1527-13 were used to determine the previous use of the Subject Property and surrounding area. A chronological summary of the sources used may include, but is not limited to aerial photographs, Sanborn maps, city directories, agency records, and prior environmental assessments. ASTI made a *good faith* effort to identify the obvious uses of the Subject Property from the present back to the Subject Property's first developed use, or back to 1940, whichever is earlier. *Data Failures* were encountered as part this assessment and are discussed as data gaps in Section 8.4.

5.4.1 Aerial Photographs

ASTI reviewed available aerial photographs of the Subject Property area provided by EDR. Copies of the aerial photographs are included in Appendix 10.4. The aerial photographs are summarized as follows.

Year	Observations
1937	The Subject Property and adjoining sites appear to be developed, but the image is somewhat blurry.
1949, 1952, 1956, 1961, 1966, 1972	Subject Property: An apparent filling station is evident on the southeast corner of the property.
	North adjoining: The site is improved with a building.
	East adjoining: Multiple commercial buildings are evident.
	South adjoining: Multiple buildings are evident.
	West adjoining: The site is developed with two small buildings.
1983, 1987	Subject Property: No significant changes are evident.
	North adjoining: No significant changes are evident.
	East adjoining: Two prior buildings are demolished. The building on the southernmost parcel remains.
	South adjoining: The prior buildings were demolished.
	West adjoining: The prior building is demolished by 1987.
1997, 1999, 2005, 2009, 2012, 2016	Subject Property: Multiple parked/stored vehicles are evident. The building on the west portion remains.
	North adjoining: Vacant land (1997 and 1999). The current apartment buildings are established by 2005.
	East adjoining: No significant changes occurred.
	South adjoining: The current building is established.
	West adjoining: Vacant land (1997 and 1999). The current building is established by 2005.

Review of aerial photos did not reveal any changes in site topography that would be indicative of landfilling activities on the Subject Property. No evidence of waste disposal was noted on the aerial photos.

5.4.2 Sanborn Maps

ASTI reviewed available Sanborn maps of the Subject Property area provided by EDR. Copies of the Sanborn maps are included in Appendix 10.4. The maps are summarized as follows.

Year	Observations
1889, 1897, 1919, 1921	Subject Property: Two dwellings were evident.
	North adjoining: Residential development were depicted. Flats were depicted by 1919
	East adjoining: Residential development were depicted.
	South adjoining: Residential development were depicted.
	West adjoining: Residential development were depicted.
1950, 1953, 1957, 1961, 1977	Subject Property: A filling station with two gas tanks were evident on the southeast corner. One dwelling remained on the west. By 1953, the prior structures were removed, and a small building was depicted on the west. The site remained a “filling station”.

Year	Observations
	North adjoining: Depicted with flats and stores.
	East adjoining: Depicted with flats and stores.
	South adjoining: Depicted with multi-family residential and a flat.
	West adjoining: Depicted with two flats.
1988, 1991, 1996, 2002	Subject Property: The building remained, but the site was no longer designated as a "filling station".
	North adjoining: Depicted buildings were identified as a vacant restaurant, a flat, and a vacant flat. The property lot across the alleyway was depicted as parking by 1991.
	East adjoining: One store was depicted.
	South adjoining: Vacant property was depicted.
	West: The prior flat was depicted as a "fire ruins" (1988). The building was removed by 1991. By 2002, the site was depicted with the current building.

5.4.3 City Directories

City directory research was conducted by EDR (Appendix E). The table below summarizes non-residential use information about the Subject Property.

Year	Observations
1926	Northwest corner Second Avenue & Stimson (now Martin Luther King Jr. Boulevard) – Standard Oil Co
1931	3515 Second Avenue - Standard Oil Co
1935	3513 Second Avenue – Standard Oil Co
1940	3515 Second Avenue – Bossence Wm S – filling sta
1957, 1962	3515 Second Avenue - Earl's Standard Service
1967	3515 Second Avenue - Russ Tire & Battery
1982, 1987	Second Avenue Service
1992, 1995	H & R Auto Service

5.4.4 Title Search

A title search was not included in the scope of this Phase I ESA.

5.4.5 Prior Environmental Investigations

ASTI was not provided with, nor is aware of, prior environmental investigations for the Subject Property.

5.4.6 Summary of Historical Uses on the Subject Property

Based on review of the obtained historical sources, the historic use(s) of the Subject Property is summarized as follows.

From at least 1889 to 1921, the Subject Property was developed with two residential dwellings. By at least 1926, the east dwelling was demolished, and a gasoline filling station replaced it on the southeast portion of the site. Two gas tanks associated with the filling station were identified in the 1950 and 1953 Sanborn maps. By 1957, the west dwelling and gasoline filling station were demolished and replaced with a building on the west which was identified as a gasoline filling station from at least 1957 to 1977. From at least 1967 to 1995, in addition to gasoline filling operations, the site operated as a tire and battery service and/or automobile service shop and used car sales lot. The building became vacant sometime after 1995 and was demolished in 2018.

5.5 Historical Use Information on Adjoining Properties

Based on review of the obtained historical sources, the historic uses of adjoining properties are summarized as follows.

Summary of Historic Uses of Adjoining Properties	
Direction	**Historical Use Summary**
North	The sites were developed for residential use by at least 1889. Commercial use of the sites began around the 1950s.
East	The sites were developed for residential use by at least 1889. Commercial use of the sites began around the 1950s.
South	The sites were developed for residential use by at least 1889. Commercial use of the sites began around the 1950s.
West	The site was developed for residential use by at least 1889. Commercial development began in around the 1950s.

6.0 SITE RECONNAISSANCE

6.1 Methodology and Limiting Conditions

Assessor Name and Title	Mr. Anthony Spencer, EP
Date of Inspection	March 26, 2020
Weather Conditions	50 º F and overcast
Methodology	Inspected the Subject Property in a meander and search pattern, including all property boundaries, and adjoining properties from Subject Property and public access areas.
Access Limitations	Overgrown vegetation
Adverse Subject Property Conditions	No

6.2 General Site Settings

General Location	A Site Location Map is provided in Appendix 10.1.
City/Township, County, State Zip Code	Detroit, Wayne County, Michigan 48201
Acreage	0.36 acre
Local Development Utilization	Mixed commercial and multi-family residential

6.3 Exterior Observations

The following table summarizes the site exterior observations. Items observed are discussed further following the table.

Category	Item	Item Observed
Above Ground Hazardous Substances and Petroleum Products	Drums, barrels or containers ≥5 gallons in connection with identified uses	No
	Drums, barrels or containers ≥5 gallons not in connection with identified uses	No
	Unidentified Substance Containers	No
	ASTs	No
Underground Hazardous Substances and Petroleum Products	USTs (fill ports and/or vent pipes)	No
	Fuel dispensers	No
	Natural gas or petroleum pipelines/wells	No
Basic & Specialized Systems (Electrical, Hydraulic, Refrigeration, & PCBs)	Pole-mounted transformers	No
	Pad-mounted transformers	No
	Capacitors	No
	Hydraulic equipment	No
	Emergency generator	No

Category	Item	Item Observed
	High-power transmission lines (EMF)	No
Indications of Releases or Potential Releases	Stained soil or pavement	No
	Stressed vegetation	No
	Pools of liquid	No
	Strong or pungent odors	No
	Filled Land	No
	Unregulated/Unauthorized Waste Disposal	No
Drainage & Waste Collection Systems	Pits	No
	Ponds	No
	Lagoons	No
	Sumps	No
	Storm water collection basins	No
	Monitor wells	No
	Dry wells/crocks	No
	Oil-water separators	No
	Regulated/Authorized Waste Removal (Dumpsters)	No

Items noted as not observed do not fully warrant that these items are not present on the Subject Property as some items may not have been readily observable.

6.4 Interior Observations

There are no interior spaces on the Subject Property.

7.0 INTERVIEWS

7.1 Interview with Owner

An Owner Questionnaire was not completed prior to completion of this assessment.

7.2 Interview with Key Site Manager

Refer to Section 6.1.

7.3 Interview with Occupants

The Subject Property does not have any occupants.

7.4 Interviews with Local Government Officials

Conversations with local government officials were limited to requesting records. No significant information was obtained from the interviews.

7.5 Interviews with Others

No others were interviewed as part of this assessment.

8.0 EVALUATION

8.1 Findings

From at least 1889 to 1921, the Subject Property was developed with two residential dwellings. By at least 1926, the east dwelling was demolished, and a gasoline filling station replaced it on the southeast portion of the site. Two gas tanks associated with the filling station were identified in the 1950 and 1953 Sanborn maps. By 1957, the west dwelling and gasoline filling station were demolished and replaced with a building on the west which was identified as a gasoline filling station from at least 1957 to 1977. From at least 1967 to 1995, in addition to gasoline filling operations, the site operated as a tire and battery service and/or automobile service shop and used car sales lot. The building became vacant sometime after 1995 and was demolished in 2018.

The Subject Property operated a gasoline filling station from at least 1926 to 1977 before modern leak/release detection systems were common to detect compromised USTs and piping. Additionally, based on the nature of gasoline filling station operations, a release may have occurred from chronic over filling over an extended period.

The User representative stated the Owner of the property had demolished the prior building and removed onsite USTs with permits. Provided permits included a wrecking permit, a water disconnection notice, and a document that indicated an asbestos survey may have been conducted prior to demolition. No documents regarding the removal of the USTs were provided. It is unknown if the verification sampling was conducted during removal of the USTs to determine whether a release had occurred. USTs commonly become compromised over time and could be the source of a release.

From at least 1967 to 1995, in addition to gasoline filling operations, the site operated as a tire and battery service and/or automobile service shop and used car sales lot. Operations associated with automobile battery and service shops include the storage, collection, and disposal of petroleum products, hazardous substances, and hazardous waste. These operations occurred before modern stricter regulations and permitting regarding the handling of hazardous materials (i.e., spill prevention, spill response, manifesting, etc.). Even with cautious practices, automobile service shops commonly result in a release to the environment over an extended period of time. The operations of a tire and battery service

and/or automobile service shop with unknown material management practices over an extended period is considered a REC.

Two gasoline USTs were depicted on the 1950 and 1953 Sanborn maps. Due to the length of the gasoline station operations, it is likely that additional USTs were used on the Subject Property. No USTs were registered with the State of Michigan. Local records were unavailable for review. The fate of USTs at the Subject Property is unknown.

The southern adjoining property of 631 Martin Luther King Jr. Boulevard is identified as a Baseline Environmental Assessment (BEA) site. BEA sites are known to contain concentrations of contamination in excess of the most restrictive State of Michigan Generic Residential Cleanup Criteria (GRCC). ASTI requested a copy of the BEA and associated documents from EGLE, but records were not obtained and reviewed prior to completion of this assessment. The inability to review these records is considered a significant data gap. Based on the proximity of the site, and the nature of BEA sites, the site is considered a REC for the Subject Property.

The City of Detroit Assessing, Building, and Fire Department records were not available for review due to the recent municipal office closures as a result of the Covid-19 virus. Municipal records may contain information regarding prior USTs associated with the prior gasoline filling operations on the Subject Property. The inability to review these records is considered a significant data gap. Reviewing these records at a later date could alleviate this data gap.

The foundations of previous buildings may include basements. Fill material could have been required to return to grade any potentially resulting cavities, and the source of the fill is unknown. This is considered a significant data gap. The type of backfill and grading materials used prior to stricter permitting regulations commonly included demolition materials and/or industrial by-products. Historic fill materials often contained hazardous substances and/or petroleum products. If demolition debris is encountered, asbestos containing materials may be present.

8.2 Opinion

Based on the site inspection, interviews, regulatory and municipal records review, and review of historical documentation, the following is opined by the EP.

1. The EP did not identify any de minimis conditions associated with the Subject Property.

2. The EP did not identify any HRECs associated with the Subject Property.

3. The EP did not identify any CRECs associated with the Subject Property.

4. The EP did identify RECs associated with the Subject Property.

8.3 Additional Investigation

A subsurface investigation is recommended to evaluate the identified RECs and significant data gaps.

8.4 Data Gaps

Data gaps occur when the EP is unable to obtain information required despite a *good faith* effort.

Data failure is one type of data gap. According to ASTM Practice E1527-13, data failure occurs when all of the standard historical sources that are *reasonably ascertainable* and likely to be useful have been reviewed and yet the objectives have not been met. Historical sources are required to document property use back to the Subject Property's first developed use or back to 1940, whichever is earlier. A data failure occurred and is described below.

Data Gap	Inability to determine the first developed use of the Subject Property.
Is this a significant data gap?	No
Rationale	The site was developed for residential use by at least 1889. It is likely that the site was undeveloped or farmland prior to the earliest known uses.

Additional data gaps were encountered during the investigation consisting of the following.

Data Gap	Inability to obtain and review EGLE records for a BEA site adjoining to the south.
Is this a significant data gap?	Yes
Rationale	Reviewing the BEA and associated records would help resolve this significant data gap.

Data Gap	Inability to obtain and review Detroit Assessing, Building, and Fire Department records.
Is this a significant data gap?	Yes.
Rationale	Municipal records might contain information regarding prior USTs on site for gasoline filling operations. Reviewing municipal records would alleviate this data gap.

Data Gap	Inability to interview the Owner of the Subject Property.
Is this a significant data gap?	No
Rationale	Other sources provided sufficient information regarding past use of the Subject Property.

Data Gap	Inability to determine all prior heating sources for historical structures on the Subject Property.
Is this a significant data gap?	No
Rationale	Although no evidence (i.e., fill ports, vent pipes, or pressure gages, etc.) or information regarding the use of heating fuel was found during the assessment, based on the age of prior residences (built in the late 1800s and early 1900s), there is a potential that heating oil was used as a fuel source prior to natural gas. If a buried heating oil fuel tank is found during any redevelopment activities, the tank should be properly decommissioned with verification sampling conducted.

Data Gap	The foundations of previous buildings may include basements. Fill material could have been required to return to grade any potentially resulting cavities, and the source of the fill is unknown.
Is this a significant data gap?	Yes
Rationale	The type of backfill and grading materials used prior to stricter permitting regulations commonly included demolition materials and/or industrial by-products. Historic fill materials often contained hazardous substances and/or petroleum products. If demolition debris is encountered, asbestos containing materials may be present. If fill materials are encountered during redevelopment activities, the material should be properly characterized and managed in accordance with applicable regulations.

8.5 Conclusions

We have performed a Phase I ESA in accordance with the scope and limitations of ASTM Practice E1527-13 of 3515 2nd Avenue in Detroit, Wayne County, Michigan, the Subject Property. Any exceptions to, or deletions from, this practice are described in Section 5.4 of

this report. This assessment has revealed no recognized environmental conditions in connection with the Subject Property, except for the following.

- The Subject Property operated a gasoline filling station from at least 1926 to 1977 before modern leak/release detection systems were common to detect compromised USTs and piping. Additionally, based on the nature of gasoline filling station operations, a release may have occurred from chronic over filling over an extended period.

- From at least 1967 to 1995, in addition to gasoline filling operations, the site operated as a tire and battery service and/or automobile service shop and used car sales lot with unknown materials management practices.

- At least two gasoline USTs were used at the Subject Property. Additional USTs may be present on-site.

- The southern adjoining property of 631 Martin Luther King Jr. Boulevard is identified as a BEA site. BEA sites are known to contain concentrations of contamination in excess of the most restrictive EGLE GRCC. Since EGLE records were not obtained and reviewed prior to completion of this assessment and based on the proximity of the site, the site is considered a REC for the Subject Property.

Significant Data Gaps

The southern adjoining property of 631 Martin Luther King Jr. Boulevard is identified as a BEA site. ASTI requested a copy of the BEA and associated documents from EGLE, but records were not obtained and reviewed prior to completion of this assessment. The inability to review these records is considered a significant data gap. Based on the proximity of the site, and the nature of BEA sites, the site is considered a REC for the Subject Property.

The City of Detroit Assessing, Building, and Fire Department records were not available for review due to the recent municipal office closures as a result of the Covid-19 virus. Municipal records may contain information regarding prior USTs associated with the prior

gasoline filling operations on the Subject Property. Reviewing these records at a later date could alleviate this data gap.

The foundations of previous buildings may include basements. Fill material could have been required to return to grade any potentially resulting cavities, and the source of the fill is unknown. The type of backfill and grading materials used prior to stricter permitting regulations commonly included demolition materials and/or industrial by-products. Historic fill materials often contained hazardous substances and/or petroleum products. If demolition debris is encountered, asbestos containing materials may be present.

8.6 Additional Services

No additional services were performed.

8.7 Deviations

No deletions, deviations, or additions to E1527-13 have occurred during this assessment, except for MSHDA Environmental Review Requirements for 2020.

8.8 References

The following references were used in preparing this Phase I ESA.

- Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E1527-13
- Michigan State Housing Development Authority Environmental Review Requirements for 2020
- Standard Guide for Vapor Encroachment Screening on Subject Property Involved in Real Estate Transactions: ASTM E2600-15
- The EDR Radius Map Report with GeoCheck
- The EDR Aerial Photo Decade Package
- EDR Certified Sanborn Map Report
- The EDR-City Directory Image Report, Date / City Directories, Library of Michigan
- User Questionnaire
- Assessing Department
- EGLE Perfected Environmental Liens List, 10-11-19
- http://www.deq.state.mi.us/GeoWebFace/
- https://pvnpms.phmsa.dot.gov/PublicViewer/
- U. S. Fish and Wildlife Service

- FEMA

8.9 Signature(s) of Environmental Professional

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 312.10 of 40 CFR 312.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Pam Chapman, PE, EP
Phase I Group Leader

8.10 Qualification(s) of Environmental Professional(s)

Ms. Pam Chapman has been conducting Phase I Environmental Site Assessments for over 26 years. Ms. Chapman has a B.S.E in Civil Engineering from the University of Michigan. Ms. Chapman is an Environmental Professional and a Professional Engineer (PE), MI No. 67062.

9.0 NON-SCOPE SERVICES DISCUSSION

9.1 Asbestos-Containing Materials (ACMs)

There are no structures present on the Subject Property.

9.2 Lead-Based Paint (LBP)

There are no structures present on the Subject Property.

9.3 Radon Gas

Wayne County is not a MSHDA radon mitigation county. Wayne County is located within EPA Radon Zone 3.

9.4 100-Year Floodplain

The Subject Property is not located within a flood hazard zone per FEMA Panel 26163CO285E dated February 2, 2012 (Appendix 10.7).

9.5 Wetlands

A wetland delineation was not included in the scope of this Phase I ESA. No obvious wetland features were observed on the Subject Property parcel. ASTI obtained a National Wetlands Inventory map from the U.S. Fish and Wildlife Service (Appendix 10.7). No NWI wetlands were identified.

9.6 EMF

No EMF lines were observed near the Subject Property.

No cell towers or roof top phone towers, antennas, or arrays were observed.

9.7 High Pressure Buried Gas Lines

The Subject Property is not believed to be located within 1,000 feet of buried high-pressure gas transmission lines, per a map obtained from the U.S. DOT National Pipeline Mapping System (Appendix 10.7).

9.8 Noise Analysis

A Noise Assessment was conducted and is attached in Appendix 10.7. Two noise assessment locations (NAL #1 and NAL #2) were selected on the Subject Property for the

analysis based on proximity to noise sources. Using the HUD DNL calculator, the noise levels at NAL #1 and NAL #2, as predicted in 2030, are calculated to be 72.6 dB and 72.5 dB, respectively. Both noise levels are within the Normally Unacceptable range.

9.9 Assessment of Potential Vapor Encroachment Conditions, ASTM E 2600-15

The purpose of Tier 1 and Tier 2 Non-Invasive screening is to conduct an initial screen to determine if a vapor encroachment condition (VEC) exists in connection with the Subject Property. The vapor encroachment screen (VES) is conducted in accordance with ASTM E 2600-15.

Screening tests: 1) search distance test to determine if there are any known or suspected contaminated properties in the area of concern (AOC) 2) a chemicals of concern (COC) test to determine for those known or suspect contaminated properties within the AOC whether or not COC are likely to be present. The critical distance is defined as the lineal distance in any direction between the nearest edge of the contaminated plume and the nearest property boundary. For contaminated properties downgradient of the Subject Property the AOC is reduced to the area within the critical distance.

- Critical distance = 30 feet for dissolved petroleum hydrocarbon COC
- Critical distance = 100 feet for COC and petroleum hydrocarbon COC @ LNAPL

The following sites were identified for discussion by the EP in the primary area of concern, which is $^1/_3$ mile (1,742 feet) for Chemicals of Concern (COC) and $^1/_{10}$ mile (528 feet) for petroleum hydrocarbon COC.

#	Use Concern	Address	Location
1	**Prior gas station operations**	**3515 2nd Avenue**	**Subject Property**
2	**Prior auto repair operations**	**3515 2nd Avenue**	**Subject Property**
3	**A BEA site adjoining the Subject Property.**	**631 MLK Jr. Boulevard**	**Southern adjoining**

Bold is opined to be a VEC.

Concerns 1-3 are opined to represent VECs and are also RECs. Releases potentially containing COCs were likely to have occurred and based on close proximity, soil gas migration cannot be ruled out.

The screening process concludes that a VEC likely exists.

9.10 Assessment of Acceptable Separation Distance

The Subject Property is located at an Acceptable Separation Distance (ASD) from any above-ground explosive or flammable fuels or chemicals containers according to 24 CFR 51C. No explosive or flammable hazards, including ASTs were found on the Subject Property based on interviews with site managers and comprehensive site investigations.

Review of aerial photographs and AST licensing information revealed nine ASTs located within 1-mile of the property. The AST listings are summarized below. All were within the acceptable separation distance. A calculation of ASD from the ASTs was completed and is attached (Appendix 10.7).

Distance (miles)	Address	Capacity (gallons)	Contents	ASD (Yes/No)
0.153 North	666 Selden	1,000	Empty	Yes
0.332 Southwest	3200 Hobson	13,500	Not reported	Yes
0.401 East	100 Mack Ave.	2,000	Diesel	Yes
0.476 Northeast	3990 John R	20,000	Diesel	Yes
0.579 Southwest	1351 Spruce	8,000	Diesel	Yes
0.779 South	2000 2nd Ave	1,650	Diesel	Yes
0.786 Southwest	2950 Rosa Parks	1,650	Removed	Yes
0.812 South	1777 3rd Ave	6,500	Diesel	Yes
0.848 South	1 Energy	6,000	Diesel	Yes

9.11 Adjoining or Close Proximity Industrial Uses

There are no active or former adjoining or close proximity industrial sites. Therefore, no separate summary document has been prepared.

10.0 APPENDICES

10.1 Site Location Map/USGS 7.5 min. Topographic Map

10.2 Site Features Map

10.3 Site Photographs

10.4 Historical Research Documentation: Aerial Photographs, Certified Sanborn Map Report, and City Directory Summary

10.5 Regulatory Records Documentation: The EDR Radius Map Report with GeoCheck (3-18-20), Online Assessing Records, and EGLE Perfected Environmental Liens (10-11-19)

10.6 Interview Documentation: MSHDA User's Questionnaire and Development Plan

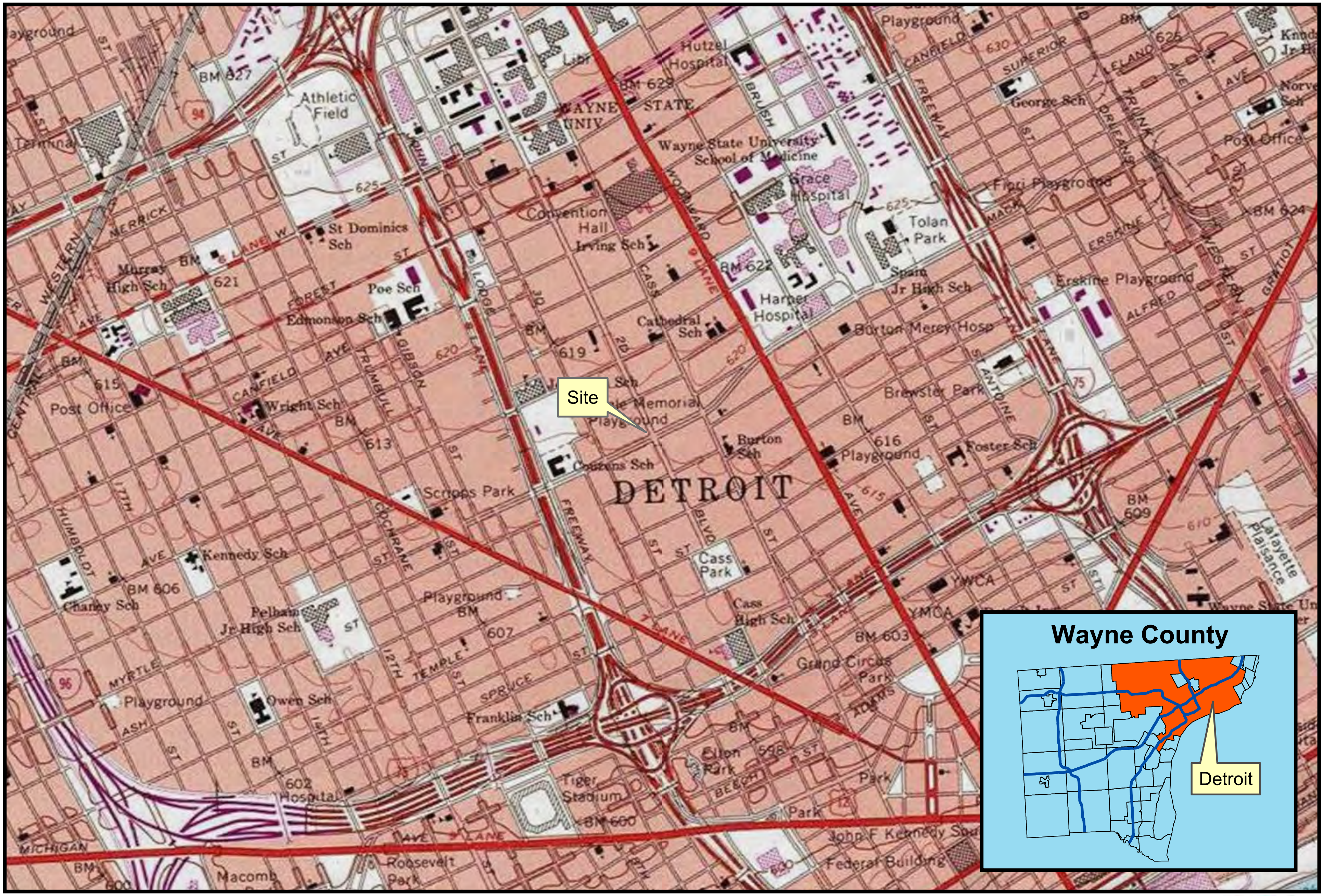
10.7 Special Contractual Conditions Between User and Environmental Professional: FEMA Firmette Map, National Wetlands Inventory Map, U.S. DOT National Pipeline Mapping System Map, Noise Assessment, and Acceptable Separtion Distance Calculations

10.8 Qualifications of the Environmental Professional(s)

10.9 MSHDA Phase I Letter of Reliance

10.10 Copy of Environmental Professional Insurance Certificate

10.1 Site Location Map/USGS 7.5 min. Topographic Map



3515 2nd Ave

Detroit, MI

2,000 1,000 0 2,000 Feet

N

ASTI ENVIRONMENTAL

Created for: MHT Housing, Inc.
Created by: RMH, March 25, 2020, ASTI Project 11469

Site Location Map

10.2 Site Features Map

Service Layer Credits: World Imagery: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,

3515 2nd Ave

Detroit, MI

0 37.5 75

N

ASTI Environmental

Client: MHT Housing, Inc.
Created by: RMH, March 25, 2020, ASTI Project 11469

Site Features Map

10.3 Site Photographs

PHOTO LOG

3515 Second Avenue, Detroit, Michigan

	**Photo 1.** The Subject Property, facing northwest near the corner of MLK and 2nd
	**Photo 2.** The Subject Property, facing southeast
	**Photo 3.** The fence-enclosed area near the north adjoining dwellings

ASTI Project No. 11469
March 26, 2020
Photographed By Anthony Spencer

PHOTO LOG

3515 Second Avenue, Detroit, Michigan

	**Photo 4.** The north adjoining apartments
	**Photo 5.** The north adjoining dwellings
	**Photo 6.** The east adjoining area

ASTI Project No. 11469
March 26, 2020
Photographed By Anthony Spencer

PHOTO LOG

3515 Second Avenue, Detroit, Michigan

	**Photo 7.** The southeast adjoining site
	**Photo 8.** The southwest adjoining site
	**Photo 9.** The west adjoining site

ASTI Project No. 11469
March 26, 2020
Photographed By Anthony Spencer

10.4 Historical Research Documentation: Aerial Photographs, Certified Sanborn Maps, and City Directory Summary

3515 2nd Avenue

3515 2nd Avenue

Detroit, MI 48201

Inquiry Number: 6013759.8

March 18, 2020

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

03/18/20

Site Name:

3515 2nd Avenue
3515 2nd Avenue
Detroit, MI 48201
EDR Inquiry # 6013759.8

Client Name:

Applied Science & Technology
10448 Citation Drive
Brighton, MI 48116
Contact: Laura Gray

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
1999	1"=500'	Acquisition Date: March 28, 1999	USGS/DOQQ
1997	1"=500'	Flight Date: April 26, 1997	DTE
1987	1"=500'	Flight Date: June 17, 1987	USDA
1983	1"=500'	Flight Date: May 10, 1983	USDA
1972	1"=500'	Flight Date: July 01, 1972	USDA
1966	1"=500'	Flight Date: November 21, 1966	USGS
1961	1"=500'	Flight Date: May 30, 1961	DTE
1956	1"=500'	Flight Date: April 13, 1956	DTE
1952	1"=500'	Flight Date: April 26, 1952	DTE
1949	1"=500'	Flight Date: April 28, 1949	DTE
1937	1"=500'	Flight Date: July 23, 1937	USDA

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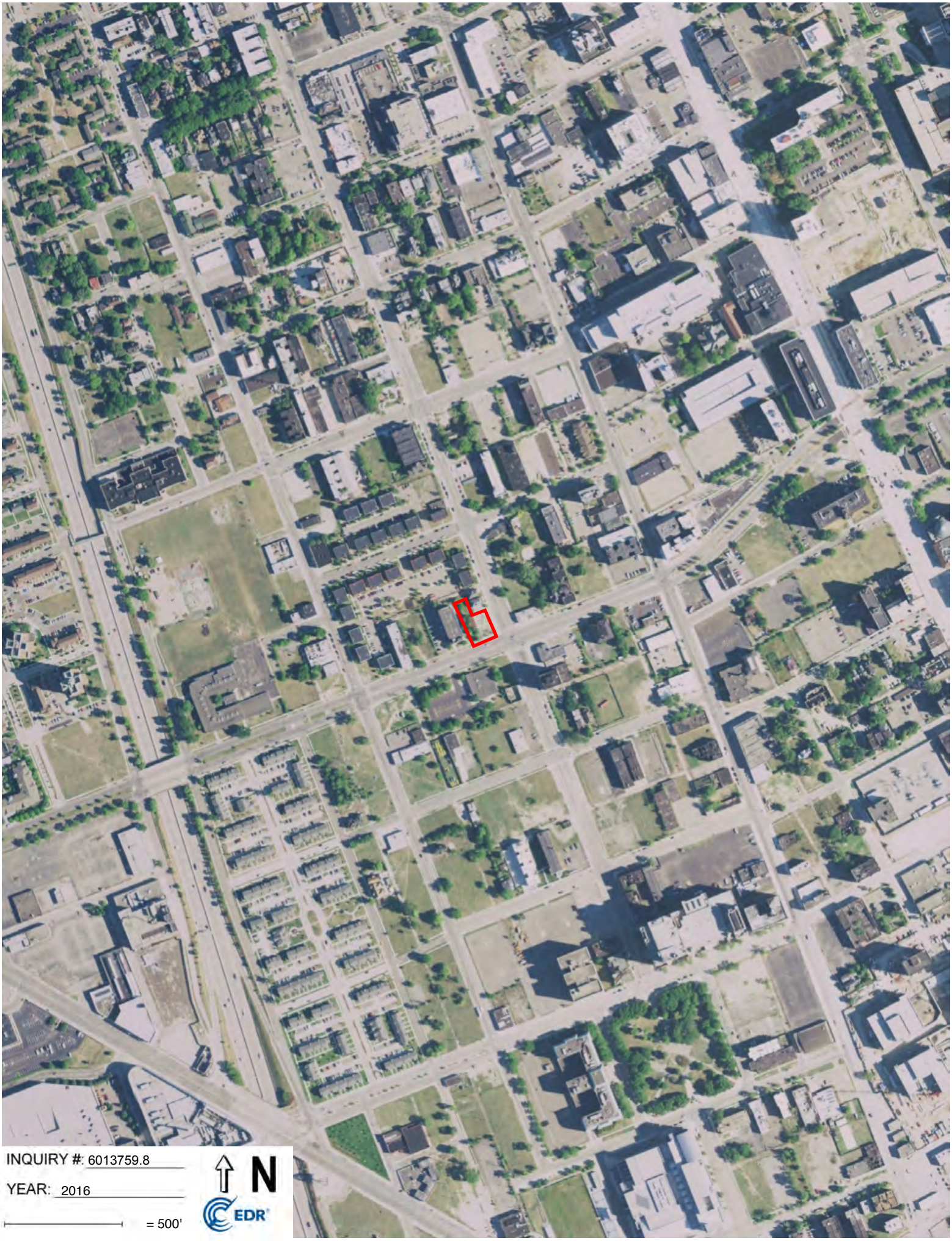
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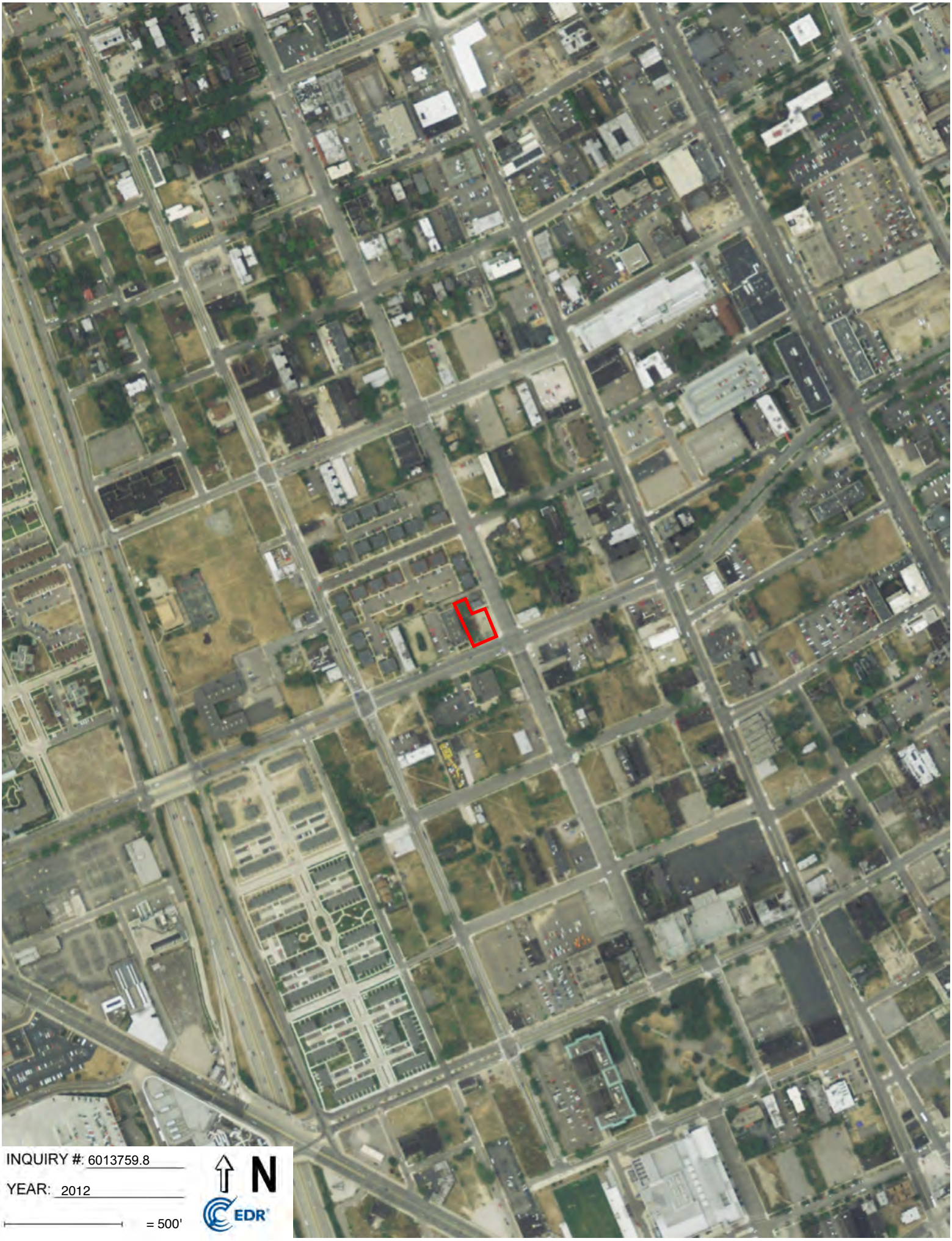
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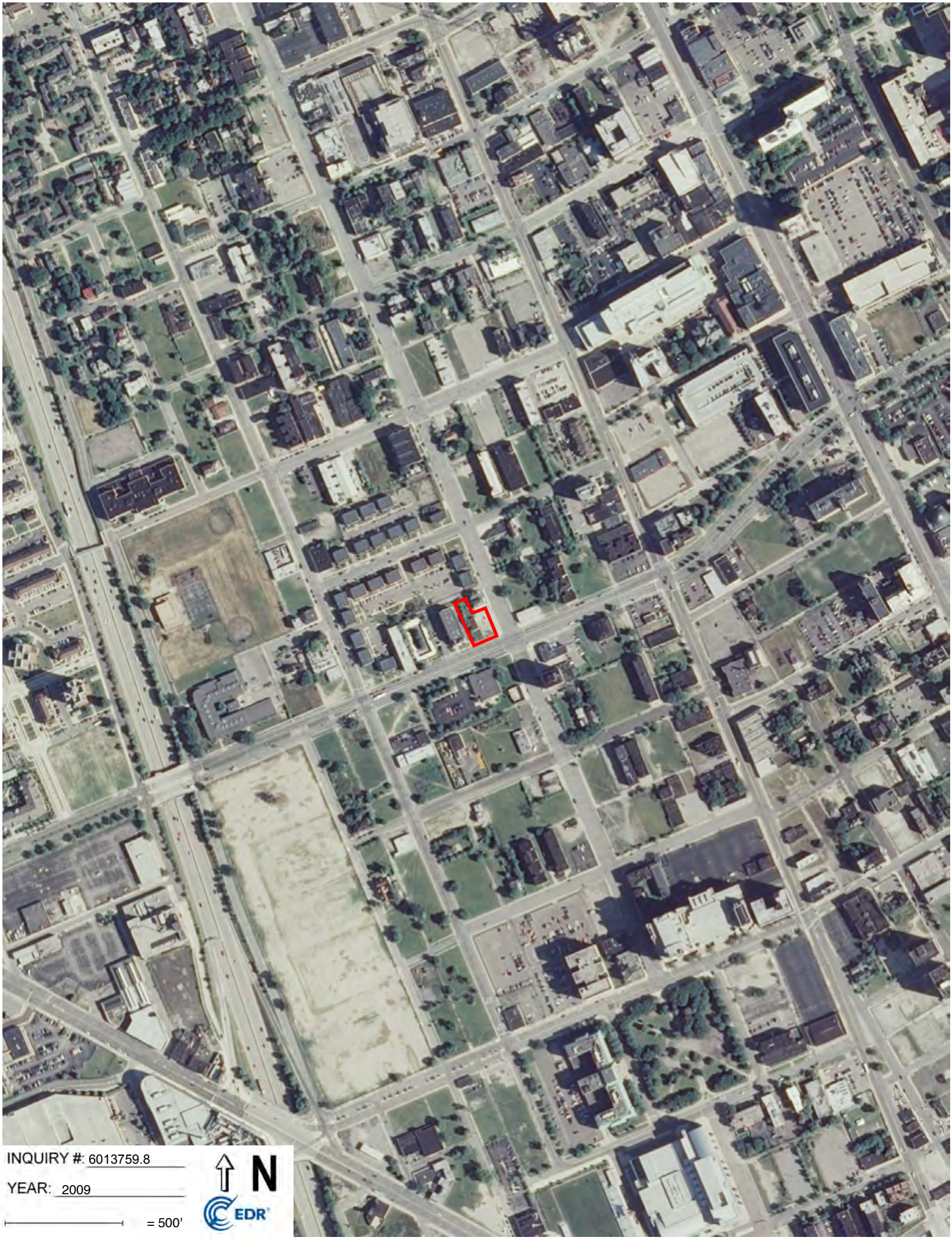
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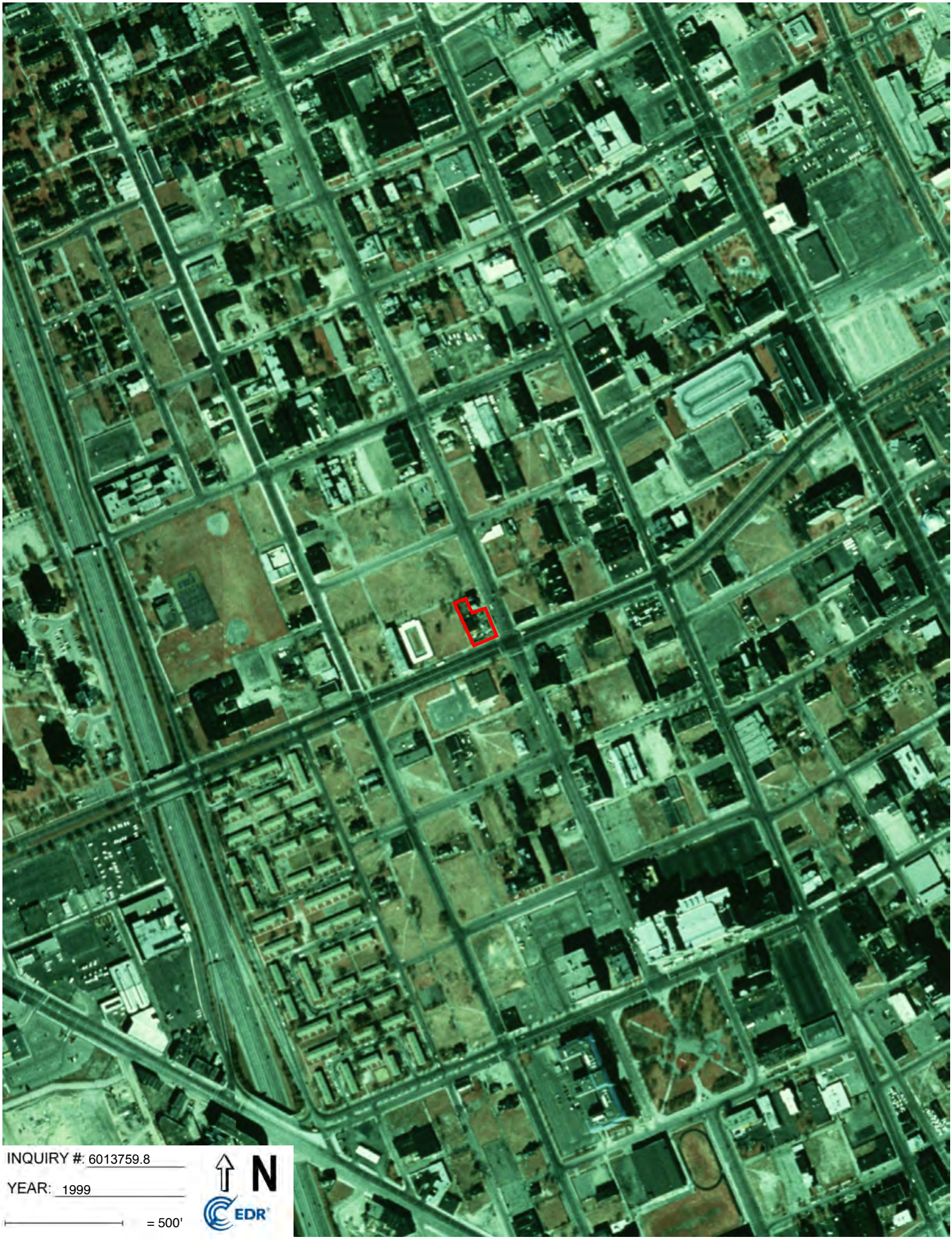
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EDR


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EDR


INQUIRY #: 6013759.8
YEAR: 1949
= 500'
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EDR


INQUIRY #: 6013759.8
YEAR: 1937
= 500'
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EDR

3515 2nd Avenue

3515 2nd Avenue

Detroit, MI 48201

Inquiry Number: 6013759.3

March 18, 2020

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

03/18/20

Site Name:

3515 2nd Avenue
3515 2nd Avenue
Detroit, MI 48201
EDR Inquiry # 6013759.3

Client Name:

Applied Science & Technology
10448 Citation Drive
Brighton, MI 48116
Contact: Laura Gray

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Certified Sanborn Results:

Certification # 5B1A-4232-8BC6

PO # NA

Project 11469

Maps Provided:

2002	1950
1996	1921
1991	1919
1988	1897
1977	1889
1961	
1957	
1953	

Sanborn® Library search results

Certification #: 5B1A-4232-8BC6

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
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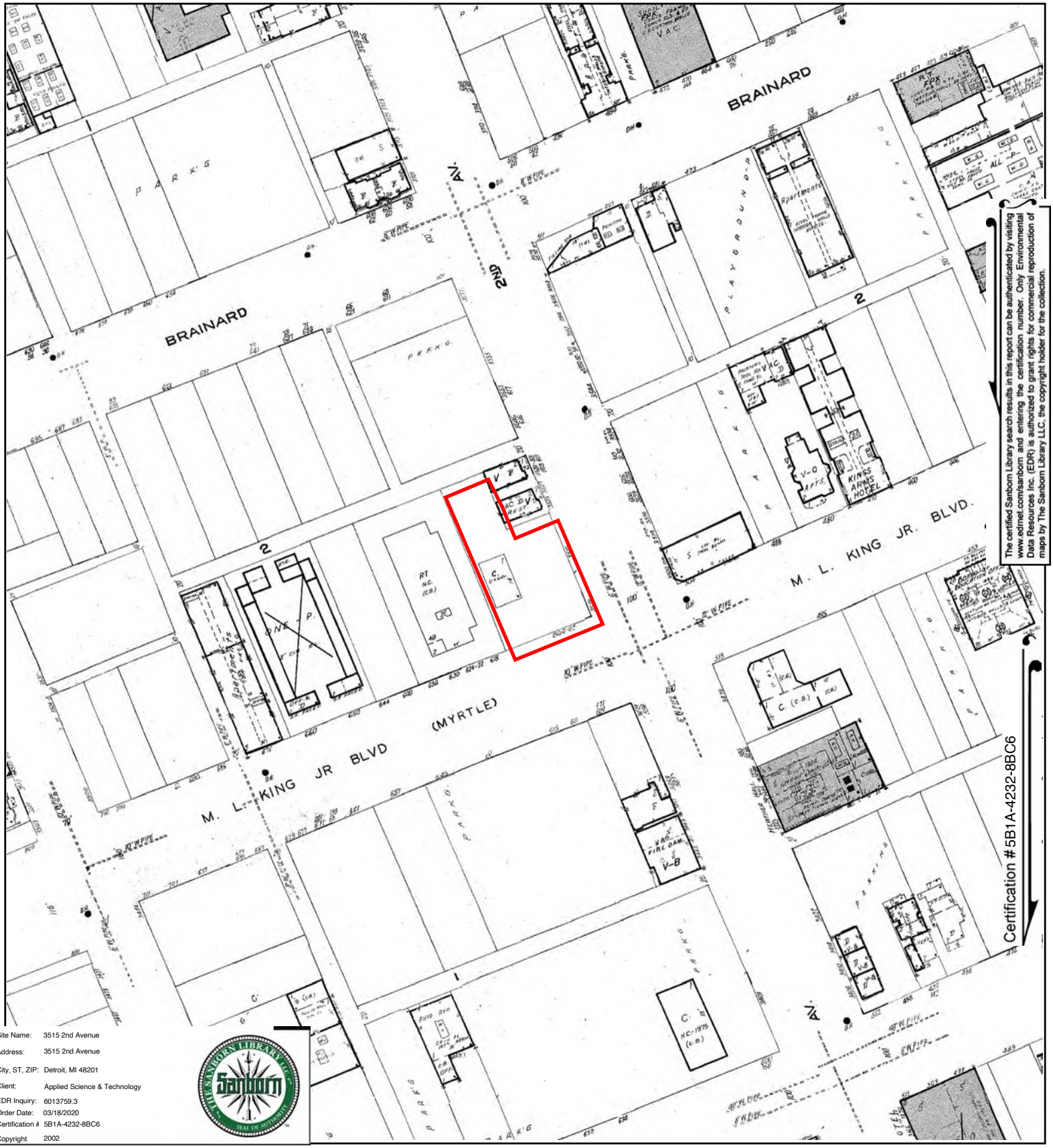

Site Name: 3515 2nd Avenue
Address: 3515 2nd Avenue
City, ST, ZIP: Detroit, MI 48201
Client: Applied Science & Technology
EDR Inquiry: 6013759.3
Order Date: 03/18/2020
Certification #: 5B1A-4232-8BC6
Copyright: 2002

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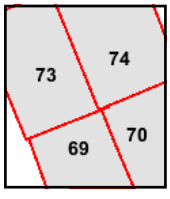

Volume 2, Sheet 74
Volume 2, Sheet 73
Volume 2, Sheet 70
Volume 2, Sheet 69

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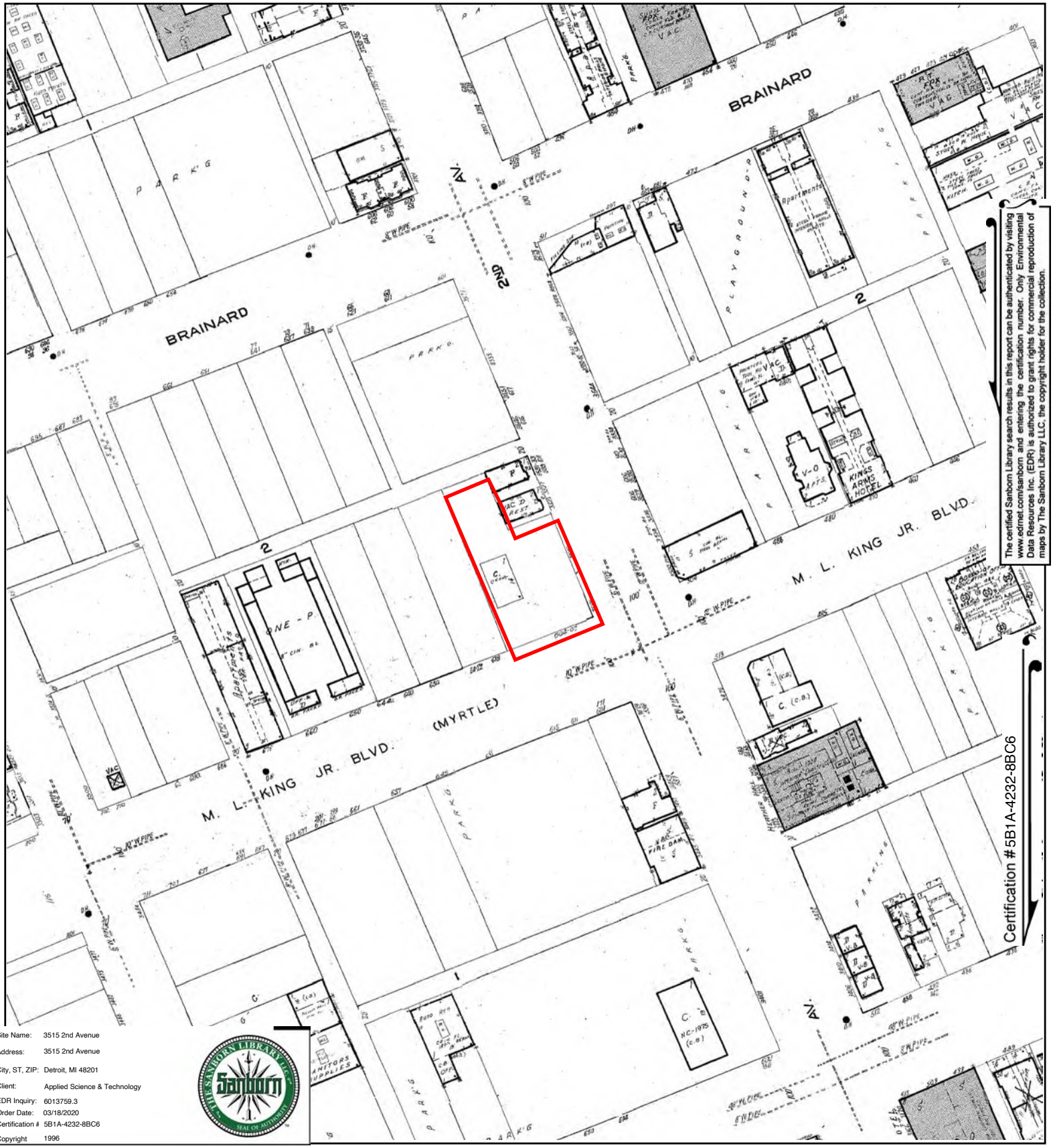

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Address: 3515 2nd Avenue
City, ST, ZIP: Detroit, MI 48201
Client: Applied Science & Technology
EDR Inquiry: 6013759.3
Order Date: 03/18/2020
Certification #: 5B1A-4232-8BC6
Copyright: 1996

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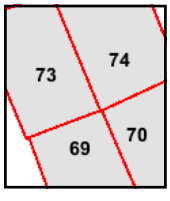

Volume 2, Sheet 74
Volume 2, Sheet 73
Volume 2, Sheet 70
Volume 2, Sheet 69

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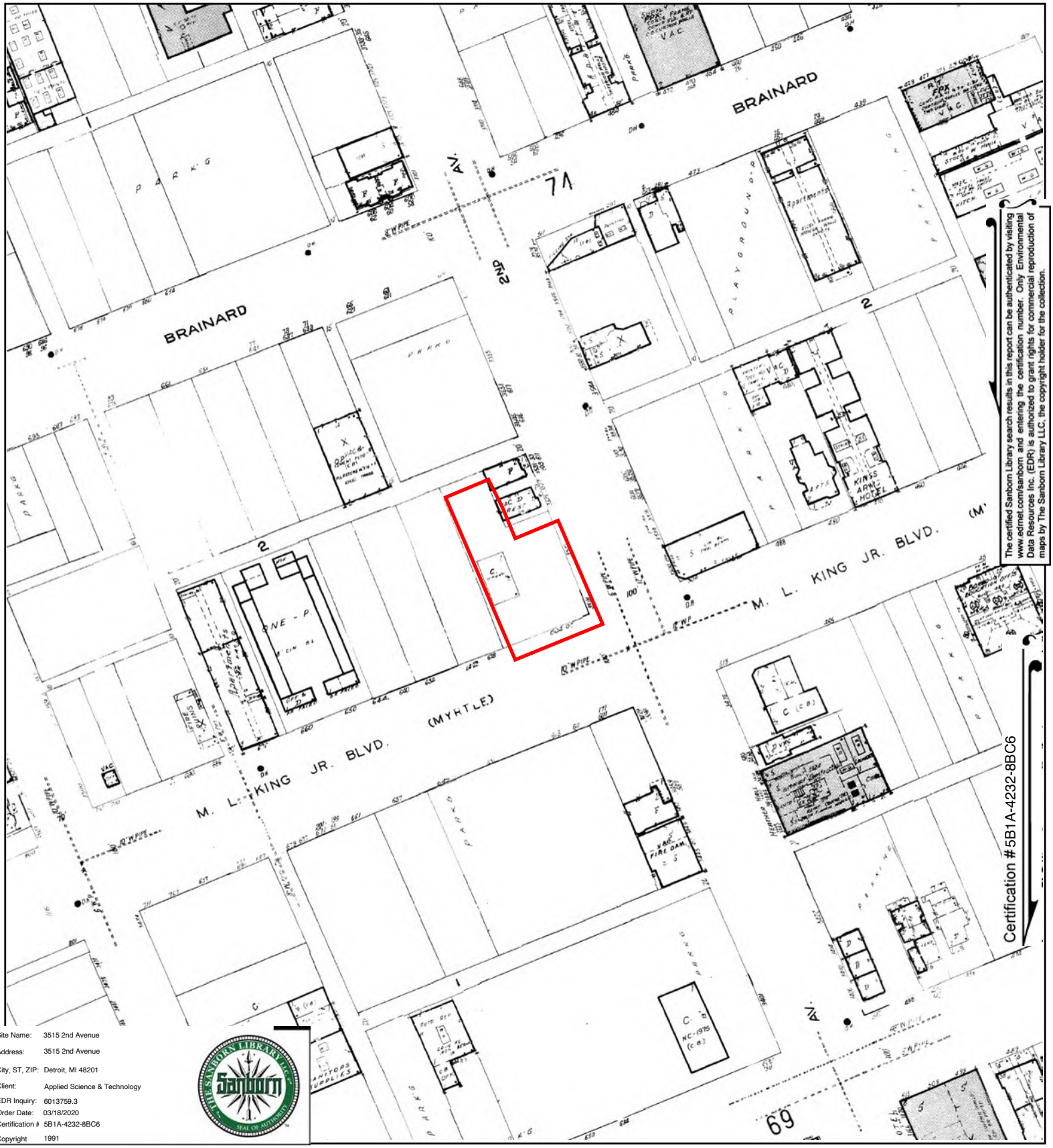

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City, ST, ZIP: Detroit, MI 48201
Client: Applied Science & Technology
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Order Date: 03/18/2020
Certification #: 5B1A-4232-8BC6
Copyright 1991

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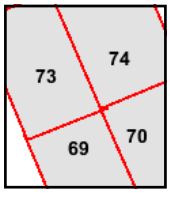

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Volume 2, Sheet 70
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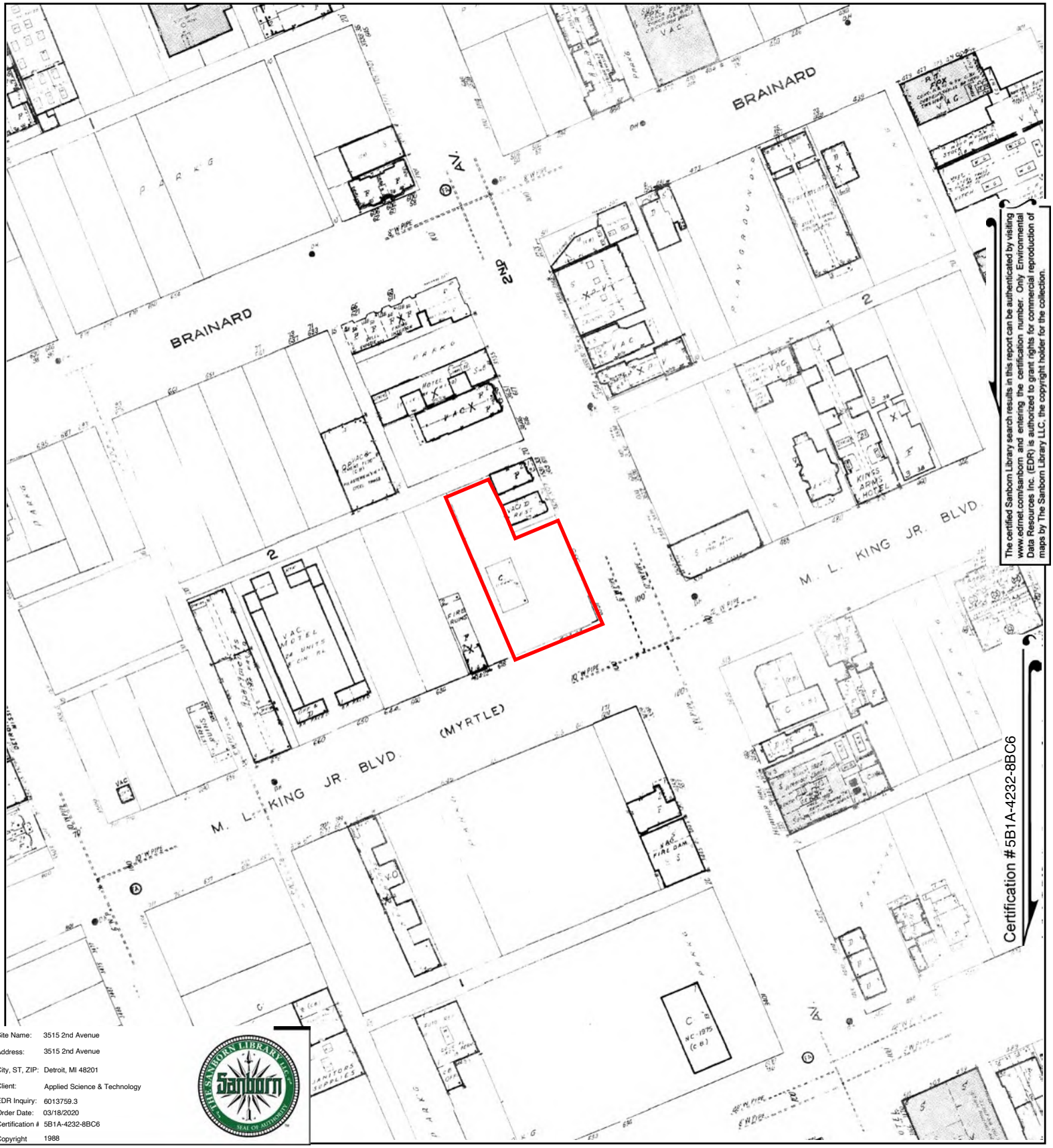

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Site Name:	3515 2nd Avenue
Address:	3515 2nd Avenue
City, ST, ZIP:	Detroit, MI 48201
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Copyright	1988

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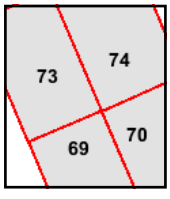

Volume 2, Sheet 74
Volume 2, Sheet 73
Volume 2, Sheet 70
Volume 2, Sheet 69

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Address: 3515 2nd Avenue
City, ST, ZIP: Detroit, MI 48201
Client: Applied Science & Technology
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Order Date: 03/18/2020
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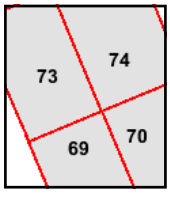

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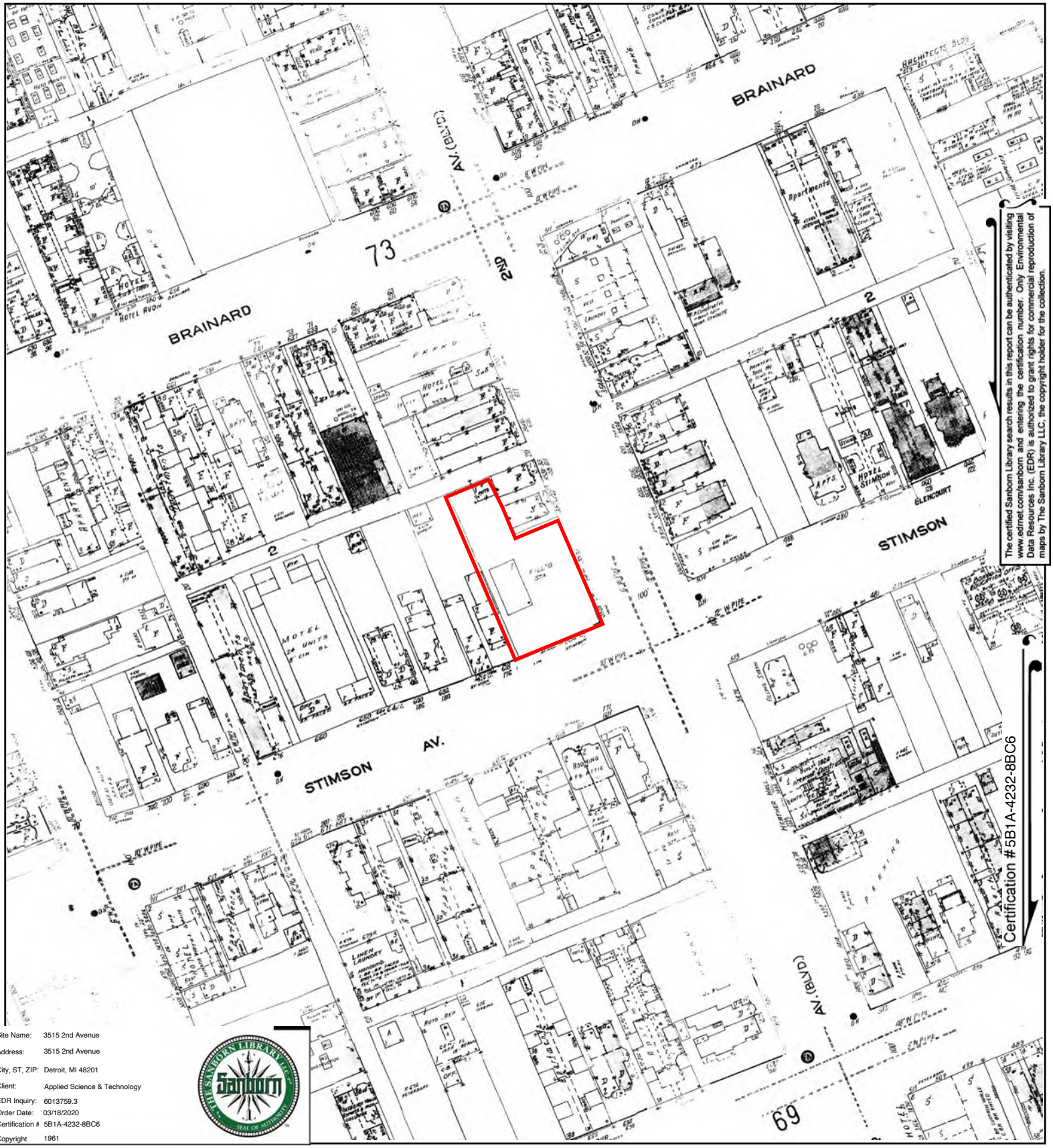

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Address:	3515 2nd Avenue
City, ST, ZIP:	Detroit, MI 48201
Client:	Applied Science & Technology
EDR Inquiry:	6013759.3
Order Date:	03/18/2020
Certification #	5B1A-4232-8BC6
Copyright	1961

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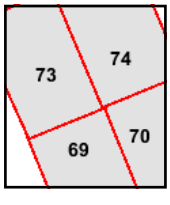

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Volume 2, Sheet 70
Volume 2, Sheet 69

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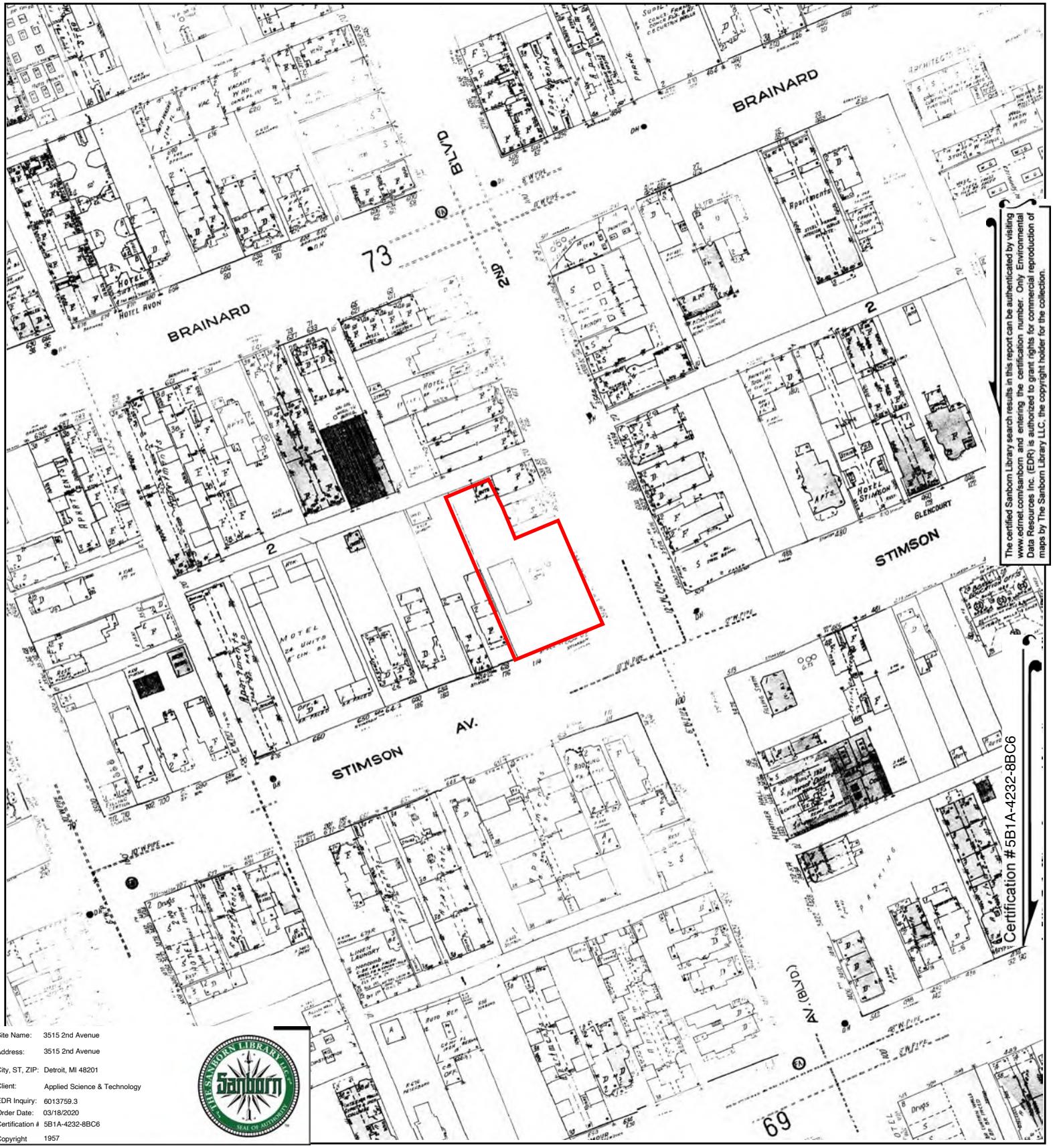

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Address:	3515 2nd Avenue
City, ST, ZIP:	Detroit, MI 48201
Client:	Applied Science & Technology
EDR Inquiry:	6013759.3
Order Date:	03/18/2020
Certification #	5B1A-4232-8BC6
Copyright	1957

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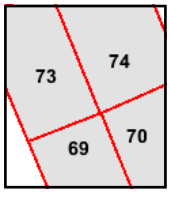

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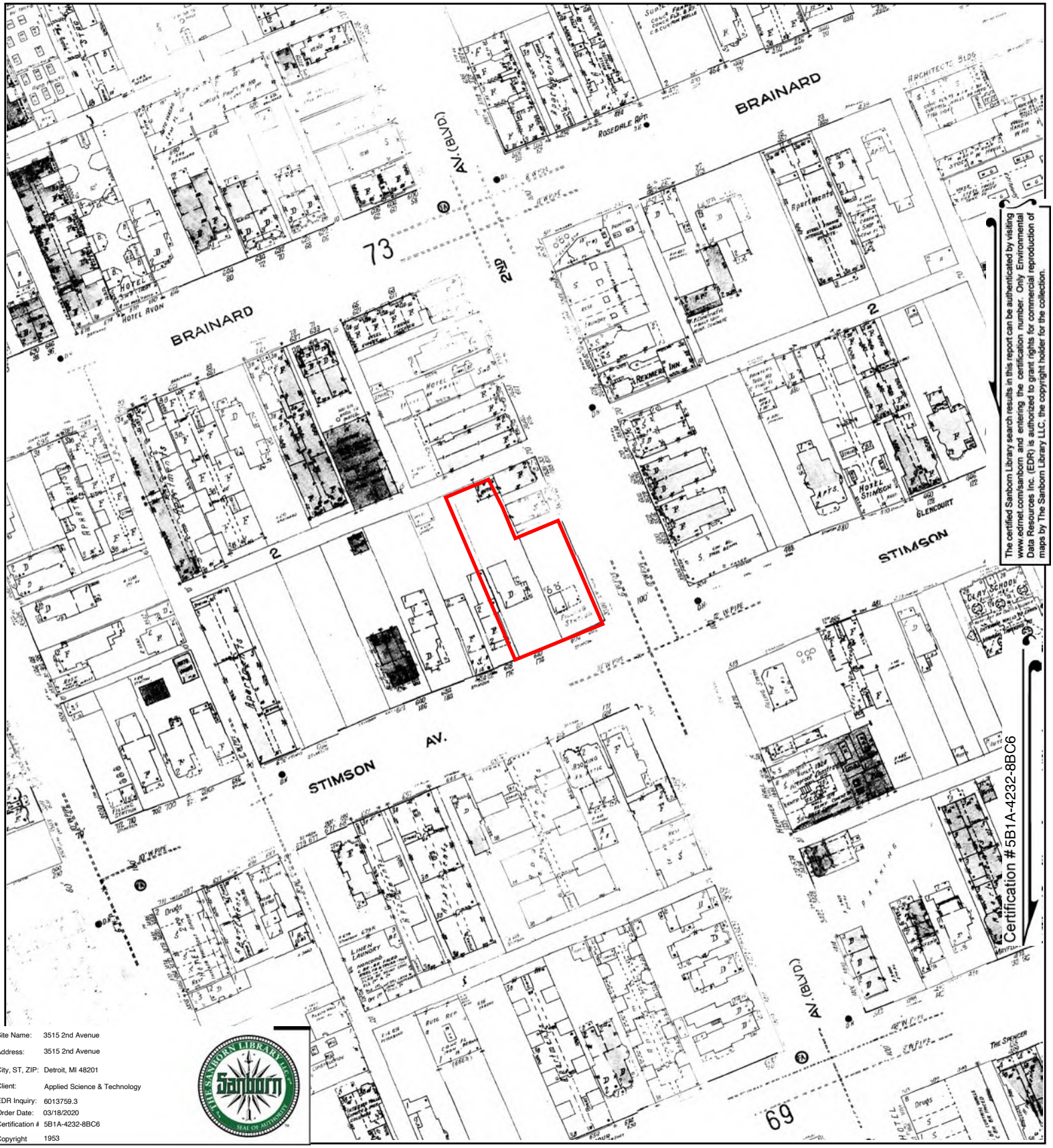

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City, ST, ZIP:	Detroit, MI 48201
Client:	Applied Science & Technology
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Certification #	5B1A-4232-8BC6
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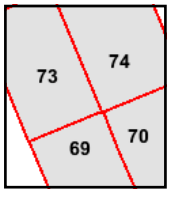

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Volume 2, Sheet 70
Volume 2, Sheet 69

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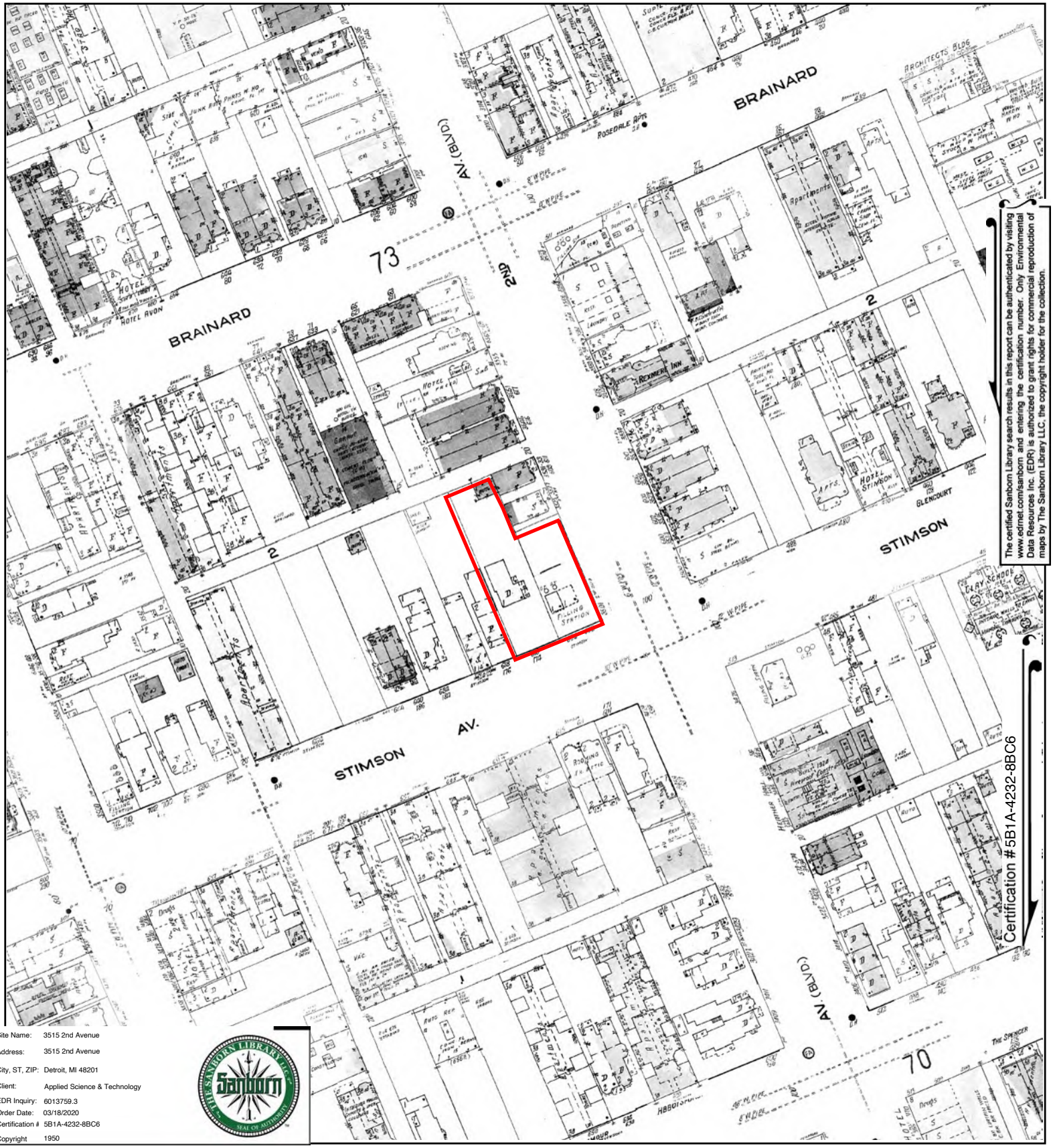

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City, ST, ZIP:	Detroit, MI 48201
Client:	Applied Science & Technology
EDR Inquiry:	6013759.3
Order Date:	03/18/2020
Certification #	5B1A-4232-8BC6
Copyright	1950

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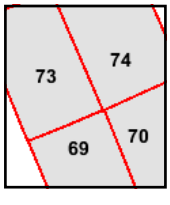

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Volume 2, Sheet 70
Volume 2, Sheet 69

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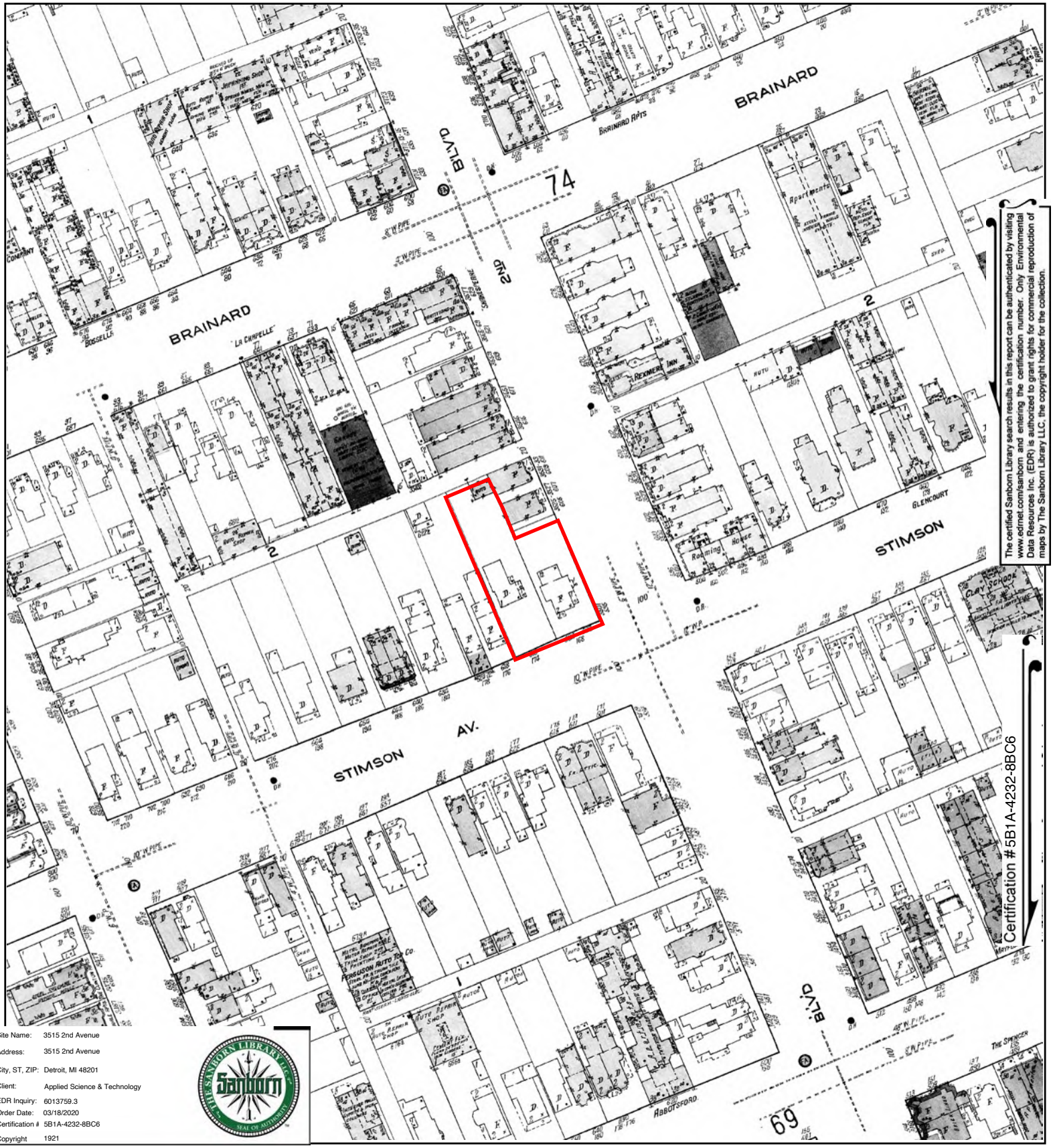

Site Name: 3515 2nd Avenue
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City, ST, ZIP: Detroit, MI 48201
Client: Applied Science & Technology
EDR Inquiry: 6013759.3
Order Date: 03/18/2020
Certification #: 5B1A-4232-8BC6
Copyright: 1921

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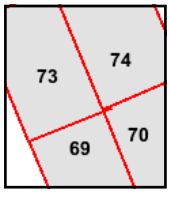

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Volume 2, Sheet 73
Volume 2, Sheet 70
Volume 2, Sheet 69

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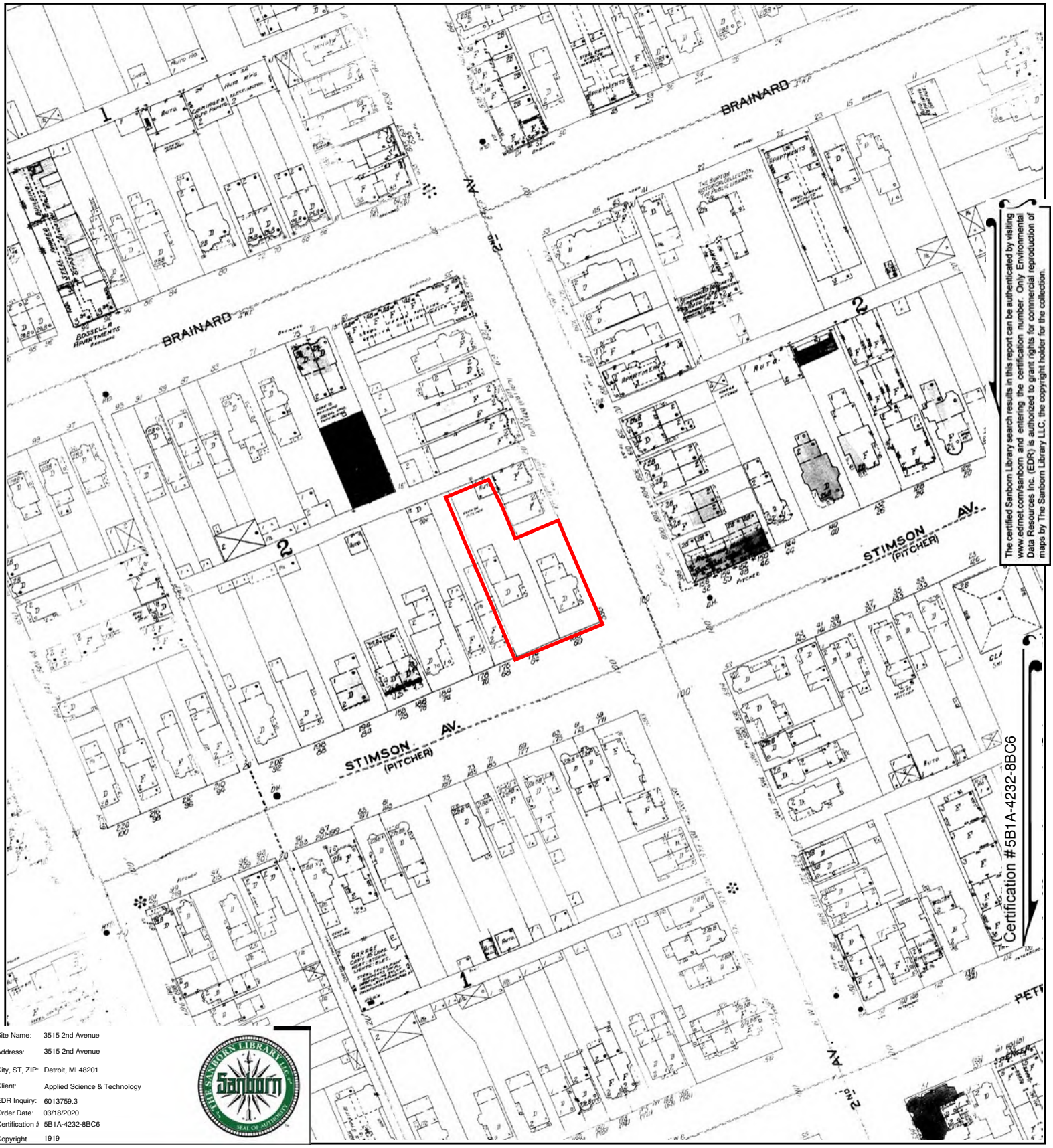

Site Name: 3515 2nd Avenue
Address: 3515 2nd Avenue
City, ST, ZIP: Detroit, MI 48201
Client: Applied Science & Technology
EDR Inquiry: 6013759.3
Order Date: 03/18/2020
Certification #: 5B1A-4232-8BC6
Copyright: 1919

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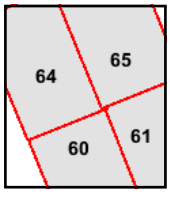

Volume 2, Sheet 65
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Volume 2, Sheet 60

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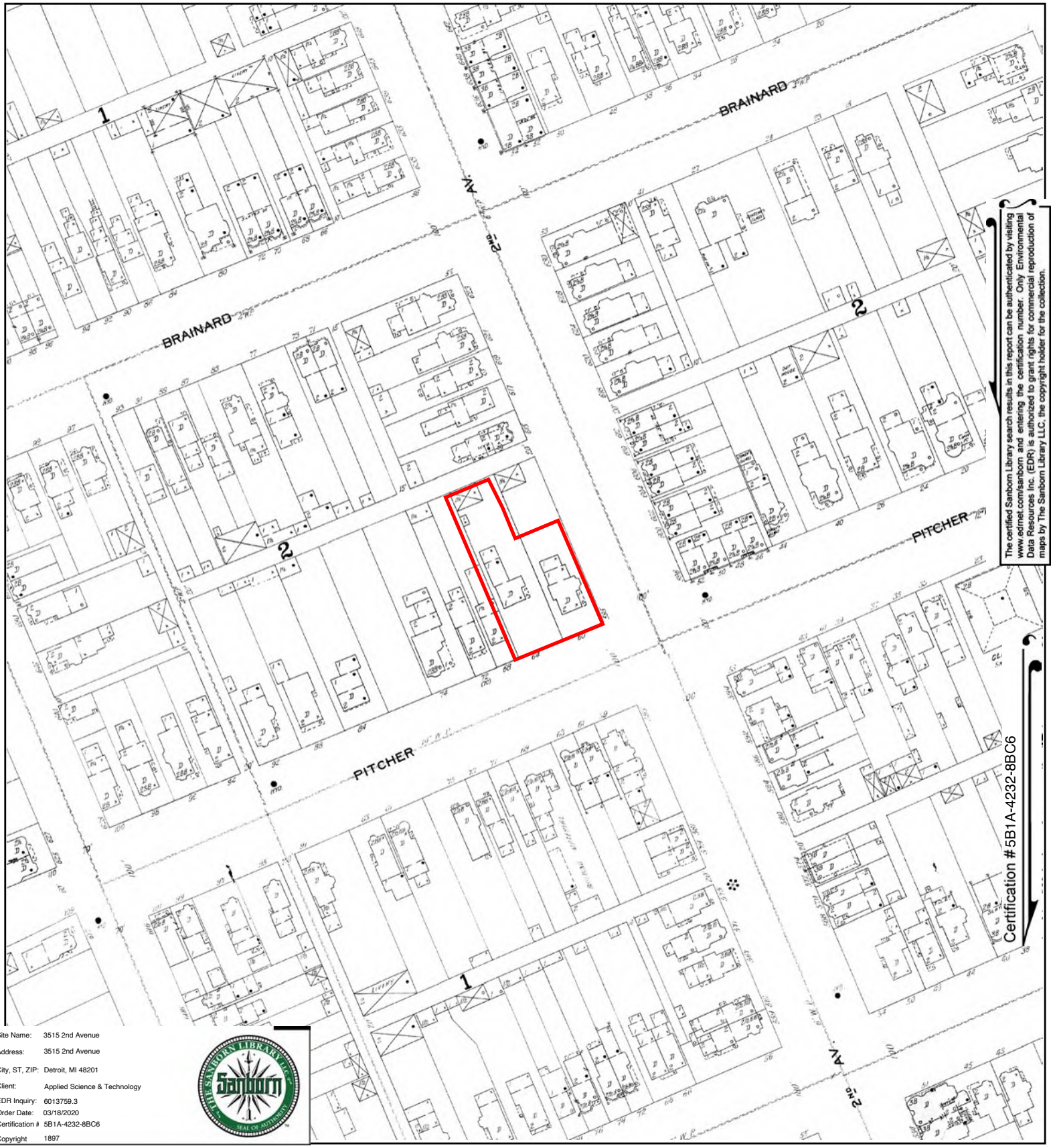

Certification #5B1A-4232-8BC6

Site Name:	3515 2nd Avenue
Address:	3515 2nd Avenue
City, ST, ZIP:	Detroit, MI 48201
Client:	Applied Science & Technology
EDR Inquiry:	6013759.3
Order Date:	03/18/2020
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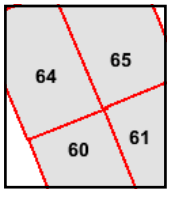

Volume 2, Sheet 65
Volume 2, Sheet 64
Volume 2, Sheet 61
Volume 2, Sheet 60

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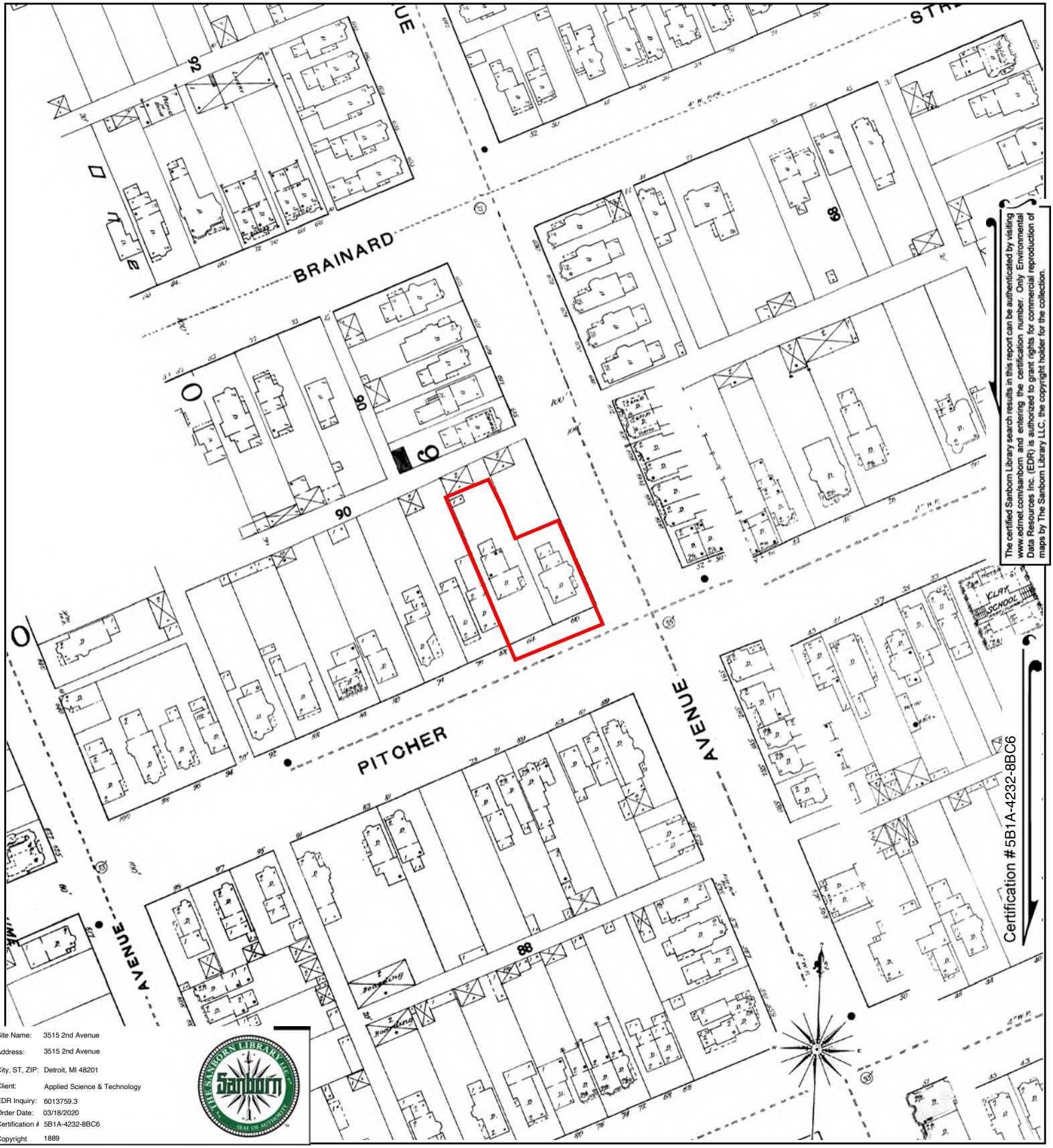

Site Name: 3515 2nd Avenue
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City, ST, ZIP: Detroit, MI 48201
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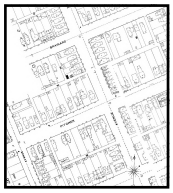
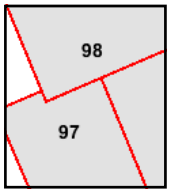
EDR Inquiry: 6013759.3
Order Date: 03/18/2020
Certification #: 5B1A-4232-8BC6
Copyright: 1889

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.





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N

3515 2nd Avenue
3515 2nd Avenue
Detroit, MI 48201

Inquiry Number: 6013759.5
March 26, 2020

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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SECTION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

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Data by infoUSA®

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2017	☑	☐	EDR Digital Archive
2014	☑	☑	EDR Digital Archive
2010	☑	☑	EDR Digital Archive
2005	☑	☑	EDR Digital Archive
2000	☑	☑	EDR Digital Archive
1995	☑	☑	EDR Digital Archive
1992	☑	☑	EDR Digital Archive
1987	☑	☑	Bresser's Cross-Index Directory Company
1982	☑	☑	Bresser's Cross-Index Directory Company
1977	☑	☑	Bresser's Cross-Index Directory Company
1972	☑	☑	Bresser's Cross-Index Directory Company
1967	☑	☑	Bresser's Cross-Index Directory Company
1962	☑	☐	Bresser's Cross-Index Directory Company
1957	☑	☐	Bresser's Cross-Index Directory Company
1940	☑	☐	Polk's City Directory
1935	☑	☐	Polk's City Directory
1931	☑	☐	Polk's City Directory
1926	☑	☐	Polk's City Directory
1921	☑	☐	Polk's City Directory

EXECUTIVE SUMMARY

Year	Target Street	Cross Street	Source
1916	☑	☐	Polk's City Directory
1911	☑	☐	Polk's City Directory

FINDINGS

TARGET PROPERTY STREET

3515 2nd Avenue
Detroit, MI 48201

Year	*CD Image*	*Source*
2ND AVE		
2017	pg A2	EDR Digital Archive
2014	pg A4	EDR Digital Archive
2010	pg A7	EDR Digital Archive
2005	pg A11	EDR Digital Archive
2000	pg A14	EDR Digital Archive
1995	pg A17	EDR Digital Archive
1992	pg A20	EDR Digital Archive
1987	pg A22	Bresser’s Cross-Index Directory Company
1982	pg A24	Bresser’s Cross-Index Directory Company
1977	pg A26	Bresser’s Cross-Index Directory Company
1972	pg A29	Bresser’s Cross-Index Directory Company
1967	pg A32	Bresser’s Cross-Index Directory Company
1967	pg A33	Bresser’s Cross-Index Directory Company
1962	pg A35	Bresser’s Cross-Index Directory Company
1957	pg A36	Bresser’s Cross-Index Directory Company
1940	pg A37	Polk's City Directory
1935	pg A38	Polk's City Directory
1931	pg A39	Polk's City Directory
1926	pg A40	Polk's City Directory
1921	pg A41	Polk's City Directory
1916	pg A42	Polk's City Directory
1916	pg A43	Polk's City Directory
1911	pg A44	Polk's City Directory

FINDINGS

CROSS STREETS

Year	*CD Image*	*Source*	
MYRTLE			
2014	pg. A6	EDR Digital Archive	
2010	pg. A9	EDR Digital Archive	
2005	pg. A13	EDR Digital Archive	
2000	pg. A16	EDR Digital Archive	
MYRTLE ST			
2017	-	EDR Digital Archive	Target and Adjoining not listed in Source
2010	pg. A10	EDR Digital Archive	
1995	pg. A19	EDR Digital Archive	
1992	pg. A21	EDR Digital Archive	
1987	pg. A23	Bresser’s Cross-Index Directory Company	
1982	pg. A25	Bresser’s Cross-Index Directory Company	
1977	pg. A27	Bresser’s Cross-Index Directory Company	
1977	pg. A28	Bresser’s Cross-Index Directory Company	
1972	pg. A30	Bresser’s Cross-Index Directory Company	
1972	pg. A31	Bresser’s Cross-Index Directory Company	
1967	pg. A34	Bresser’s Cross-Index Directory Company	
1962	-	Bresser’s Cross-Index Directory Company	Target and Adjoining not listed in Source
1957	-	Bresser’s Cross-Index Directory Company	Target and Adjoining not listed in Source
1940	-	Polk's City Directory	Target and Adjoining not listed in Source
1935	-	Polk's City Directory	Target and Adjoining not listed in Source
1931	-	Polk's City Directory	Target and Adjoining not listed in Source
1926	-	Polk's City Directory	Target and Adjoining not listed in Source
1921	-	Polk's City Directory	Target and Adjoining not listed in Source
1916	-	Polk's City Directory	Target and Adjoining not listed in Source
1911	-	Polk's City Directory	Target and Adjoining not listed in Source

City Directory Images

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2017

2933	CHEAP ELECTRIC CONTRACTORS COMPANY
	KARNICK, STEFAN V
3435	GROCER FARM
3444	ANDREWS, JANAE
	BABS, JAMES
	BALLARD, KATHY K
	BARBARA, LEONZER
	BENTLEY, ERNEST
	DAVIS, JAMES H
	FOX, LAKECIA
	GRAHAM, MARY B
	HARRISON, JAMES
	HATCHER, DENNIS E
	HEARD, EMILY
	HUNTER, MARCUS E
	JENKINS, BENNIE
	JOHNSON, VERRITA J
	LANIER, DANIELLE
	LEWIS, JAMES
	MOYER, ALFONSO F
	PHILLIPS, JAMES F
	PITTS, FRANKLIN
	PORCH, ANITAH
	PRUITT, JUAN J
	SMITH, D L
	STEWART, CRYSTAL A
	STOKES, MARCIA L
	STOKES, NAKISHA
	STONE, AGUSTAVE J
	SWANN, LATOYA
	TATE, SHARON
	THOMAS, ERIC S
	THOMPSON, YVONNE
	VASQUEZ, ARTURO
	WALKER, PRISCILLA A
	WHITE, RONALD
	WILLIAMS, ALLEN
	WILLIAMS, GLENDA M
	WORTHAM, HANIEL
3470	FREDS KEY SHOP & LOCKSMITH
3551	ADAMS, SHANELL A
	BOYKIN, JONATHAN
	BOYKIN, SIBYL A
	CONLEY, JOYCE J
	JENKINS, VERONICA C
3571	AVERETT, JUSTIN
	FRAZIER, KHRISTIE R
	YOUNG, J
3745	BROWN, ADRIENNE M
	LEE, JEANETTE L

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2017 (Cont'd)

3745	MARION, MICHAEL W
	MEDOW, MICHAEL A
3751	SIMS, LADONNA V
	WATKINS, GEORGE W
3753	BRYANT, BRANDON H
	RIGGS, BRIDGETT S
	ROSS, CHRISTOPHER J
3760	JONES, SHARLEEN
3761	CORONADO II APARMENTS
	ROBINSON, DAWN N
3763	BLOUNT, JON
	BUSH, MAQUITA
	JAMES, DOMINISHA L
3771	GARDNER, MARLEEN L
	HAYES, ALIYAH
	TOLES, CEDRIC M
3773	HARVEST, JENNIFER L
	STAGG, NICOLE M
3921	SELDON STANDARD
3951	GOLDENBERG, OREN
3962	CHENG, CHAMNAP
3972	HAWTHORNE, AFT
	LINENFELSER, ERIKA
	OBERLAND, ELYSE M
3977	KHOLER, RUSSELLE E
3980	ALEX & BECK LLC
	COX, SARAH F

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2014

3044	GRAYSON, JOHNIE L
3131	WHITE GROVE RESTAURANT
3435	GROCER FARM MKT
3436	WEBSTER, ANNIE
3444	ALLEN, BRANDON K
	BALL, KENNETH W
	BARBARA, LEONZER
	BOLDEN, VELMA J
	BROWNING, SHIRLEY
	BURTON, TERETHA
	CHEAP CHEAP APPLIANCE REPAIR
	CLAY, TYEISHA
	CRAWFORD, MARCO D
	DAVIS, JAMES H
	DEVONE, GREGORY L
	FIELDS, EDDIE
	GOODWIN, KIM R
	GRAHAM, MARY B
	GREEN, DEBORAH A
	HARGRAY, BELINDA
	HUMPHREY, JAMES F
	JACKSON, BARBARA J
	JACKSON, ROBERT L
	MCKEE, LORIANN
	MITCHELL, JOHN
	MORGAN, TONY H
	MOYER, ALFONSO F
	PITTS, FRANKLIN
	POROSHENKO, EVGENY
	PRUITT, JUAN J
	ROUSSEAU, RON
	RUDOLPH, TRACY C
	STEWART, CRYSTAL A
	STOKES, MARCIA L
	THOMPSON, YVONNE
	TRANZIE, MICHAEL R
	VASQUEZ, ARTURO
	WIGGINS, KENNETH M
	WILLIAMS, GLENNIS W
	WILSON, JESSE
	WORTHAM, HANIEL
	WRIGHT, ROGER L
	YOUNKINS, GRACE A
3551	BOYKIN, SIBYL A
	BRADLEY, ALECIA B
	CONLEY, JOYCE J
	JENKINS, VERONICA C
	ROQUEMORE, DIANJILE E
	THOMAS, FELICIA
3571	DUREN, LINDA

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2014 (Cont'd)

3571	SMITH, CHARLES L
	TATE, CAROL
	YOUNG, MARKEYSHA S
3745	BROWN, ADRIENNE M
	DORN, PATRICK N
	LEE, JEANETTE L
3751	POPLAR, SANDRA D
	SIMS, NICHELLE F
3752	OCCUPANT UNKNOWN,
3753	BRYANT, BRANDON H
	RIGGS, BRIDGETT S
	ROSS, CHRISTOPHER J
3760	DORN, REBECCA L
3761	CORONADO II APARTMENTS
	DENNARD, TYREEA
	ROBINSON, DAWN N
3763	BLOUNT, JON
	BUSH, MAQUITA
	GRAVES, EBONY M
	NORMAN, HUGH C
3771	GARDNER, MARLEEN L
	HAYES, ALIYAH
	TOLES, CEDRIC M
	WATKINS, CATHERINE M
3773	BLOUNT, SHARON A
	HARVEST, JENNIFER L
	MCFARLIN, HEATHER
3815	MCKAY, JUANITA M
3951	NOLISH, JEFFREY F
	PARKS, CHRISTOPHER
3962	CHENG, CHAMNAP
	FARLEY, SHAWNTIA L
	WASHINGTON, ANTHONY D
	WINBUSH-JONES, LORENIA
3972	ALTERNATIVE TECHNOLOGY
	ELLIOT, RONALD
	GIBBS, BIANCA M
	JOSHUA, JAMES W
	STOKES, TAMEKA
3977	KHOLER, RUSSELLE E
3980	OCCUPANT UNKNOWN,

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

MYRTLE 2014

453	LOMAX, ANDREW
470	KRISELL, JOHN
644	BUTCHEE, DUYANE
	DEAN, DALE
	LEE, MARTHA R
	MATTEN, D
	WILLIAMS, LARRY
660	MURPHY, DONALD
676	JAGIELO, JUDY
939	THOMAS, VERETTA
943	GOODE, MORENE
1300	HERMAN, EILEEN

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2010

2952	LANDY, JOEL
3044	GRAYSON, JOHNIE L
3131	WHITE GROVE RESTAURANT
3435	GROCER FARM
3436	WEBSTER, ANNIE
3437	AUSTIN, JESSICA J
3444	BELL, JAMES W
	CASEY, AMANDA
	CLAY, TYEISHA
	COLEMAN, EARL E
	DAVIS, C
	DELISE, FULLER
	DEPTUCK, JOHN
	DEYEL, AMANDA
	DIGGS, MICHELLE
	FLEMING, LINDA
	GOREE, YVES M
	GRAHAM, MARY B
	GULLEDGE, KARL
	HARGRAY, BELINDA
	HATCHER, DENNIS
	HAWKINS, GREGORY
	JACKSON, ROBERT
	LAJUA, ANGA G
	MORGAN, JUDY
	MORTON, LAWRENCE J
	MOYER, ALFONSO
	NORTH, DESSIE
	REYNOLDS, JAMES B
	RUDOLPH, TRACY
	SHIRLEY, LAURA J
	SPICER, C
	STRAUCH, CHRISTINE C
	THORNTON, MARKELLA S
	VASQUEZ, ARTURO
	WATSON, GLENN
	WELLS, SAMUEL L
	WILLIAMS, GLENNIS W
3470	FREDS KEY SHOP
3525	MALMSTEN, JEFFREY
3551	ALLEN, TONI
	DELAINE, NIKA
	HOLMES, DONNA
	MOORE, ANDREA
	SANDERS, SHARISSE
3571	CASEY, GLORIA
	FAST, BIANCA
	RANDALL, JEREMY
	SINGLETARY, J
	SMITH, CHARLES L

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2010 (Cont'd)

3571 THOMAS, GEORGE
WILKS, MONIQUE
3745 DORN, FRANCINE A
ROSS, TREVOY
3753 RIGGS, BRIDGETT
3760 DORN, JOSHUA J
3761 WHITFIELD, GLORIA J
3763 NORMAN, MARVIN C
3771 CAMBELL, THERESA D
COSEY, ASHLEY
GARDENER, ARITA
GREEN, LEONARD
MCINNIS, CARL
3773 CRAWFORD, BRANDON
WHITTED, DOROTHY A
3815 MCKAY, JUANITA M
3951 DAVIS, EVELYN M
DAWKINS, RONDO K
3962 ALTMAN, ALEX
BLOCKER, JACK J
BRAGGS, ANTOINE
DUNLAP, C
FARLEY, SHAWNTIA
FULLER, JAMES
GLOVER, LETRIECI
HOLMES, DEVON
PARKER, J
ROBINSON, ANTHONY
SIMON, DALE R
WILLIAMS, JOSEPH L
WINBUSH, LEE
3972 ALTERNATIVE TELEPHONE SVC
GARDNER, L
GUYTON, C
3977 JOHN POPE HOSPITALITY HOUSE
KHOLER, RUSSELLE E
3980 PAYNE, MARK A
4120 TOMBOY MARKETS

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

MYRTLE 2010

453	LOMAX, ANDREW
644	BLACK, PEBBLES
	BRYANT, TONY
	BUTCHEE, DUYANE
	DEAN, DALE
	GRANT, OWEN
	SEAWRIGHT, CARLA
676	BAKER, ELAINA J
	BELANGER, GREGORY
	CARCER, ANNE
	CASON, RICKEY
	JAGIELO, JUDY
	MCGEE, LINDA
	PAUL, ALBERTA
	PRITCHETTE, MATTHEW
690	DANIEL, KIERSTON
927	SEELEY, TANASHA M
939	THOMAS, VERETTA
943	GOODE, MORENE
951	BATTLE, JANELL R
1300	HAIRSTON, SHIRLEY

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

MYRTLE ST 2010

484 BRUNING CALVIN E

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2005

3171	SABBS BAR
3189	SABBS MARKET
3435	GROCER FARM
3436	WEBSTER, ANNIE
3444	BLEIDL, PAUL J
	COCHRAN, SAMONA S
	ELLIOTT, ALTHEA
	FANT, SEAN L
	FAULKEN, SHAWN R
	FORD, SEAN G
	GRAHAM, MARY B
	HARGRAY, BELINDA
	HAYNES, QUTRINA
	HENLEY, KENNETH
	HICKS, SHIRAN
	HOWELL, ROSE
	JETER, T
	JOHNSON, CHARLES
	KRUEGER, DIANNA
	MANFRE, ROBERT
	MCCLUNZ, SHEILA
	MCDONALD, GLENDA
	MCDONALD, VICKIE
	MCGRATH, JOHN
	MICHIGAN MAID CLEANING SERVICE
	MOORER, GLANDA
	MORGAN, JUDY
	PHILLIPS, JEROME J
	RANDERSON, DIANE
	SAUTURAL, JOHN M
	SHEPHERD, JOE
	STEWART, ROTHERS
	VASQUEZ, ARTURO
	WADSWORTH, JERIEL D
	WATSON, K
	WHITSEY, L
	WILCOX, ANNETTE
	WRIGHT, KENNETH L
3470	FREDS KEY SHOP & LOCKSMITH
3525	MALMSTEN, JEFFREY
3527	OCCUPANT UNKNOWN,
3533	OCCUPANT UNKNOWN,
3713	SECOND BRAINARD MARKET
3745	DORN, FRANCINE A
	GREGORY, ALBERT
3751	GREEN, JACQUELINE A
	HAYDEN, SHELLY L
	JONES, TEANNA
3752	KRISEL, WILLIAM M
3753	HENDON, VANESSA

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2005 (Cont'd)

3753	MCKINNEY, A
	RHODES, CLYDE E
3760	STEWART, GAYLE D
3761	COOK, FREDERICK
	PETTWAY, ALISE
	WALDEN, MILTON L
	WHITFIELD, GLORIA J
3763	CRUMSEY, FRANK
	MADISON, EDWARD
	NORMAN, MARVIN C
3771	CAMBELL, THERESA D
	EDMONSON, ADRIENNE
	HUNTER, NICOLE
	NELSON, BETTY
3773	GLOVER, W
	LIBIDO SOUNDS
	MCCULLOUGH, STEVEN P
	SPEED, NICHOLAS
	WHITTED, DOROTHY A
3951	BARTELS, ERICIA L
	CAMPBELL, SCHAERGES C
	DAWKINS, ERICIA B
3962	BRIDGES, Q
	BURGESS, ZEBBIE D
	C O T S ADMINISTRATIVE OFFICES CO
	DAVIS, GAIL
	DAVIS, WILLIAM N
	DILES, PATRICIA A
	EGGERS, ANDRE
	HALL, JON
	HUITT, FRED E
	JACKSON, JONATHAN
	JACKSON, REUBEN
	LEWIS, MARCEL J
	LINDSLEY, KESHA
	MCCORMICK, CELESTINE
	STINSON, DONNIE
3972	BROADWAY, DAVID M
	GREENE, C
3977	KOHLER, RUSSELLE
	WM CONSULTING
4120	4 STAR BROTHERS INC
	JAY DOLA LLC
	JAYODOLA TOM BOYS SUPERMARKET
	TOMBOY MARKETS

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

MYRTLE 2005

644	GREEN, SHARON
	HARPER, CHARLES
	HUNT, JAMES E
	LEWIS, TIFFANY
	MASSEY, CHE P
	NEWBERRY, S
	SHAH, KENYA
	SHERMAN, TARON
	TATUM, KEVIN
	WALKER, ALANA
	WARFIELD, DENISE
	WHITE, SHACARA
660	SHAFFER, DELTRECE
676	ALLEN, DELORES
	DIXON, VINCENT D
939	THOMAS, V
943	GOODE, NOREEN
951	BATTLE, JANELL R

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 2000

3131	WHITE GROVE RESTAURANT
3171	SABBS BAR
3189	SABBS MARKET
3435	GROCER FARM
3444	AUSTIN, JOSEPH K
	AYERS, EDWARD
	BARBAT, CORNEL
	BASCH, JOSEPH
	BRIOR, JAMES R
	BURTON, JAMES C
	CHARITY, WALKER T
	CHRISTIANSSON, SVEN G
	COLLINS, JESSE
	DEPTUCK, JOHN
	FAULKEN, RAY
	GILMER, DARRYL S
	GRAHAM, MARY B
	GRIFFIN, JESSIE J
	HANNA, SAAD
	JACKSON, DELON
	JONES, B
	MACDONALD, ALBERT A
	MANFRE, ROBERT
	MANN, JOHN
	MOORE, DAVID
	NEITA, GERALD J
	OLIVER, WESLEY
	REED, DIMITRI
	SCHUTTE, JACK M
	STACEY, JOHMN
	STEWART, ROTHERS
	VASQUEZ, ARTHUR
	WATKINS, LATONYA R
	WHITE, RUFUS
	WILLIAMS, WILLIE
	ZIELINSKI, JAMES
	ZIVKOVICH, LARRY
3459	MATHENA, KERMIT
3470	FREDS KEY SHOP & LOCKSMITH
3574	GERIS AUTO SERVICE
3745	DORN, RACHEL R
	SANTIAGO, ANN M
	SELDEN ROOFING CO
3751	LAKITS, LESLIE
	MCGARRAH, TORIA
	NELSON, M
3753	MCGARRAH, TORIA
	MCLEOD, DOUGLAS
	RHODES, LORENZO
	WHIPPLE, JAMES A

2ND AVE 2000 (Cont'd)

3760	STEWART, GAYLE D
3761	MCCARROLL, V
	WHITFIELD, GLORIA
3763	NORMAN, HUGH
3771	ALICIA, P
	CAMBELL, THERESA
	JOHNSON, RHONDA
	MANLEY, SHELTON
	NIAMIEN, MICHELE P
	PARCHMENT, A
	SMITH, STACIE
3773	JOHNSON, JOY
	MCCULLOUGH, STEVEN
	MCLEOD, DIANE L
	WHITTED, DOROTHY
3850	MICHIGAN STATE OF SECRETARY OF STATE
3951	CAMPBELL-SCHAER, CAROL
3962	BROADWAY, DAVID M
	CHENG, CHAMNAP
	COLE, JOHNNA
	DIXON, ALTHEA
	DUDDE, MARY
	DUFFY, ERIC J
	GAHRY, KENNETH
	GIBSON, G
	KANIARZ, R L
	KENNETH, W G
	LEWIS, MARCEL
	MCKOY, BELVIN
	NASH, CARL
	NGARE, G
	PATRICK, D
	PEACE, RODINA
	PINSON, EDD
	PRYOR, ERIC
	WASHINGTON, LASHAWN
3972	GARDNER, MARIE M
	GREENLEE, MAYA S
3977	LACKOWSKI, JOSHUA
	POPE JOHN HOSPITALITY HOUSE
4120	TOMBOY MARKETS

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

MYRTLE 2000

470	KINGS ARMS HOTEL
611	DETROIT COMMUNITY HEALTH CONNECTION
660	AUSTIN, JOHN
	MURPHY, DONALD
	PAYTON, ALVIN
	PEOPLE UNITED AS ONE
	ROBERTSON, SHELIA
676	ABER, DEE
	BAKER, ELAINA
	BELANGER, GREGORY
	DAWSON, GERALD
	JOINER, BILLY
	JONES, V
	MILLER, LOUIS
	REED, T
	SERIDO, BENNIE
	STARNES, GINGER
	THOMAS, GERALD E
919	THOMPSON, S
925	WHITE, MARY E
927	MILLER, MARY
931	GLASTER, PANSY
933	MIMS, EMMA
941	BRADFORD, D
	PARKER, WILLIE
949	ALI, LOUELLA

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 1995

3062	JAMES, TONI
3131	WHITE GROVE RESTAURANT
3171	SABBS BAR
3189	SABBS MARKET
3406	OCCUPANT UNKNOWNN
3414	OCCUPANT UNKNOWNN
3435	GROCER FARM
3442	OCCUPANT UNKNOWNN
3444	AYERS, EDWARD
	BASCH, JOSEPH JR
	DECHENE, MAURICE
	GRAHAM, MARY B
	MACDONALD, ALBERT A
	MANFRE, ROBERT
	MEKRAS, CHRIS
	SANDBORN, FRED
	SUWINDER, S S
	TATAKIS, HARRY
	THOMAS, LOUIS
	WALKER, DELORES
3450	BOB & BETTYS LOUNGE
	OCCUPANT UNKNOWNN
3457	HARPER, THERESA
3459	MATHENA, KERMIT
3470	FREDS KEY SHOP & LOCKSMITH
3500	MOORES AUTO SUPPLY
3515	H & R AUTO SVC
3547	OSTWALD, JAMES
3574	MACKS SERVICE
3745	STATON, LEONARD
3751	DAVIS, FARRELL
	LAKITS, LESLIE
3752	OCCUPANT UNKNOWNN
3753	TUGGLE, DIANA
3760	OCCUPANT UNKNOWNN
3761	MITCHELL, DEYONA
	SAWYERS, B L
	STOUTERMIRE, FELICIA
	WHITFIELD, GLORIA
3763	NORMAN, HUGH
3771	GRIGGS, JOSHUA
	MANLEY, SHELTON
3773	MCCARROLL, CLAUDIA
	SYLVER, EDWARD
	WHITTED, DOROTHY
3951	BERNARD, WILLIAM H
3962	CHANDLER, L
	CLEVELAND, CLINTON W
	COLEMAN, NICOLE
	COLLINS, JOHN

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 1995 (Cont'd)

3962	DANIELS, M
	JAMES, TONI
	MCCAIN, L
	MCCUE, DENNIS
	ROBINSON, JAMES O
	WILKERSON, B
3972	FIELDER, WILLIAM
	GARDNER, LEVI III
3977	JOHN POPE HOSPITALITY HOUSE
	WOLINSKI & CO
4120	TOMBOY MARKETS
4134	NEUMAIER, E A

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

MYRTLE ST 1995

453	AMERICAN RESOURCE TRAINING
	XPRESSION PUBLISHING
470	KINGS ARMS HOTEL
484	CONTROL SYSTEMS
660	PEOPLE UNITED AS ONE

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

2ND AVE 1992

2958	BOTZ, WILLIAM
	CHISM, EDGAR
3131	WHITE GRV RSTRNT
3160	BLOOMFIELD, C
	DENNEHY, FRANCIS
	MATTHEWS, JOYCE
	MOORE, J C
	ROSS, LISA
	SHORTS, RUTHIE A
	WRIGHT, A
3171	SABBS BAR
3189	SABBS MARKET
3435	GROCER FARM
3444	BARNES, J H
	BASCH, JOSEPH JR
	BROCK, NORA
	CRAIG, JAMES
	GRAHAM, MARY B
	GRIFFITHS, J
	HARE, M
	HAYES, ROBERT R
	MCCARROLL, KENNETH
	SANDBORN, FRED
	SNYDER, WINI
3450	BOB&BETTYS LOUNGE
3457	HARPER, THERESA
3470	FREDS KEY SHOP
	FREDS LOCKSMITHS
3500	MOORES AUTO SUPPLY
3515	H&R AUTO SERVS
3531	TURRICIANO, JAMES V
3574	MACKS SERVICE
3610	KHONDKER, AZIZ
3751	LAKITS, L
	WHITTED, RAYMOND
3929	DIXIE COVERALL SUP
	HARRISON CLNRS
	HARRISON LNDRY&CLN
	JAXX WIPING CLOTH
3946	DURGONS, BENNIE
3962	JORDAN, G
	LEWIS, DAVID
3972	FIELDER, WILLIAM
3977	POPE JOHN HSTLY HS
	ZEILINGER, THOMAS
4120	TOMBOY MARKETS

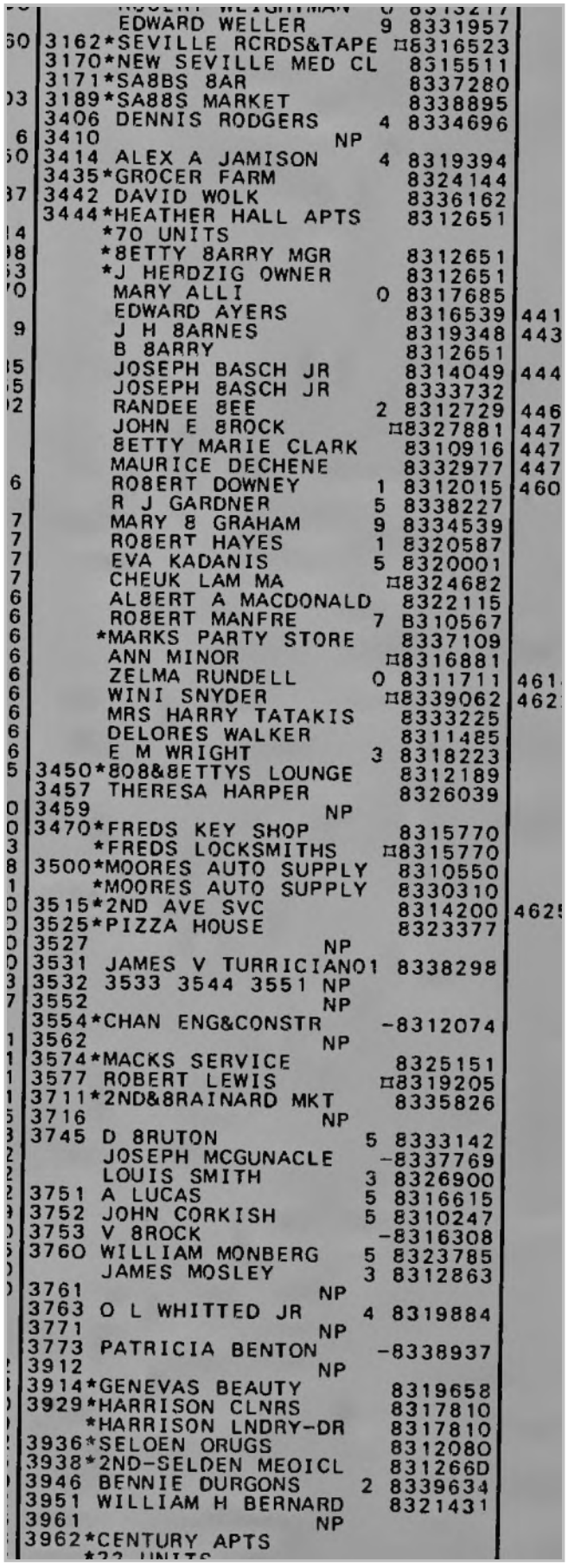
Target Street	Cross Street	Source
-	✓	EDR Digital Archive

MYRTLE ST 1992

9	CARBERY, ROBERT
11	GUFFEY, DOROTHY
78	SYKES, DON
453	AMER RESOURCE TRNG
	CARL OWENS
	CLAY SCHOOL OFC
	HALL SCHL CT RPRTG
	OCTAVO&ASSOCIATES
	OWENS, CARL
	RE-ADAPTIVE DSGNS
	RESERVE A RIDE
	SMJ CORRIDOR DEVLP
	WHOLESL PCTR FRMNG
470	KINGS ARMS HOTEL
484	BRUNING, CALVIN E
660	ST PATRICKS RSDNCE
	VIVES, FELIPE
676	DAWSON, GERALD
	HOLLAND, JANET E
	MULC, JOSEPH
67611	OTTENSMAN, AGNES K
67619	COUCH, C
470218	MORGAN, NORRIS

Target Street	Cross Street	Source
✓	-	Bresser's Cross-Index Directory

2ND AVE 1987



EDWARD WELLER 9 8331957
3162*SEVILLE RCRDS&TAPE M8316523
3170*NEW SEVILLE MED CL 8315511
3171*SA8BS 8AR 8337280
3189*SA88S MARKET 8338895
3406 DENNIS RODGERS 4 8334696
3410 NP
3414 ALEX A JAMISON 4 8319394
3435*GROCER FARM 8324144
3442 DAVID WOLK 8336162
3444*HEATHER HALL APTS 8312651
*70 UNITS
*8ETTY 8ARRY MGR 8312651
*J HERDZIG OWNER 8312651
MARY ALLI 0 8317685
EDWARD AYERS 8316539 441
J H 8ARNES 8319348 443
B 8ARRY 8312651
JOSEPH BASCH JR 8314049 444
JOSEPH 8ASCH JR 8333732
RANDEE 8EE 2 8312729 446
JOHN E 8ROCK M8327881 447
8ETTY MARIE CLARK 8310916 447
MAURICE DECHENE 8332977 447
RO8ERT DOWNEY 1 8312015 460
R J GARDNER 5 8338227
MARY 8 GRAHAM 9 8334539
RO8ERT HAYES 1 8320587
EVA KADANIS 5 8320001
CHEUK LAM MA M8324682
AL8ERT A MACDONALD 8322115
RO8ERT MANFRE 7 8310567
*MARKS PARTY STORE 8337109
ANN MINOR M8316881
ZELMA RUNDELL 0 8311711 461
WINI SNYDER M8339062 462
MRS HARRY TATAKIS 8333225
DELORES WALKER 8311485
E M WRIGHT 3 8318223
3450*808&8ETTYS LOUNGE 8312189
3457 THERESA HARPER 8326039
3459 NP
3470*FREDS KEY SHOP 8315770
*FREDS LOCKSMITHS M8315770
3500*MOORES AUTO SUPPLY 8310550
*MOORES AUTO SUPPLY 8330310
3515*2ND AVE SVC 8314200 462
3525*PIZZA HOUSE 8323377
3527 NP
3531 JAMES V TURRICIANO1 8338298
3532 3533 3544 3551 NP
3552 NP
3554*CHAN ENG&CONSTR -8312074
3562 NP
3574*MACKS SERVICE 8325151
3577 ROBERT LEWIS M8319205
3711*2ND&8RAINARD MKT 8335826
3716 NP
3745 D 8RUTON 5 8333142
JOSEPH MCGUNACLE -8337769
LOUIS SMITH 3 8326900
3751 A LUCAS 5 8316615
3752 JOHN CORKISH 5 8310247
3753 V 8ROCK -8316308
3760 WILLIAM MONBERG 5 8323785
JAMES MOSLEY 3 8312863
3761 NP
3763 O L WHITTED JR 4 8319884
3771 NP
3773 PATRICIA BENTON -8338937
3912 NP
3914*GENEVAS BEAUTY 8319658
3929*HARRISON CLNRS 8317810
*HARRISON LNDRY-DR 8317810
3936*SELOEN DRUGS 8312080
3938*2ND-SELDEN MEDICL 831266D
3946 BENNIE DURGONS 2 8339634
3951 WILLIAM H BERNARD 8321431
3961 NP
3962*CENTURY APTS
*22 UNITS

Target Street	Cross Street	Source
-	✓	Bresser's Cross-Index Directory

MYRTLE ST 1987

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     15 RESIDENCE                      3
●MYRTLE                      48201     3
                                       3
 ••      1-  599 T 5203      $8••E 7
 ••    600- 1199 T 5204      $D••E 7
 ••   1500- 2099 T 5216      $E••E 6   4
 ••   2100- 3099 T 5215      $E••E 6
 ••   3100- 3719 T 5213      $E••E 6
453*A AAA POSTR PRFCT        ¤8325554
   *8ARAN ARCHT RESTRT       ¤8310031
   *CLAY SCHOOL OFC          ¤8311870
   *CYCLE CO OF AMERIC       ¤8311870  3
   *DYNAMIC MANAGEMENT       -8331340  3
   *1ST IMPRSSNS PARTY       ¤8311870  3
   *IMAGE PERFECT INC        ¤8325555  3
   *LELAS 8OUTIOUE           ¤8311870  3
   *SMJ CORRIDOR DEVLP        8311870  3
    DARRYL ALLAN SMITH5       8334778  3
460                      NP            3
470 FRED DOVER               ¤8321069
   *KINGS ARMS HOTEL          8315880  3
480                      NP            3
484 CALVIN E 8RUNING         ¤8336867  4
485 618 620 622          NP            4
660 SANTIAGO RODRIGUEZ       ¤8336239
    ANTONIO STA8ILE         4 8319025
    FELIPE VIVES            4 8321572
661 667                  NP
676*TRENTON APTS
   *31 UNITS                           6
   *NMIA                               6
    FREEMAN BROWN           2 8311373
    JOSEPH CARNEY           1 8314182
    CLAUDINE COUCH          1 8335249
    ROBERT FLUGSTAD          -8322483
    RAYMOND H GOURLAY       5 8334757
    L OCONNELL               ¤8325501
    AGNES K OTTENSMAN        -8318361
686 6B7 919 921          NP            9
923 SELENEA EWING            ¤8331082  9
925 929 931 933          NP            9
939                      NP            9
941 ELOISE SCOTT            2 8313868  9
943 951                  NP            9
                                       9
     ••••••••••••••••••       4B208    9
1519 TRINITY PAL            9 9634064  9
1530 1542 1544 1551      NP            9
1555 1561 1567           NP
1569 M HALE                4•9611140   9
1581 GEORGE JAMO            •9844462   9
1585 1589                NP            9
1B25*CENTRAL BIBLE MSSN       9843013
1831 1837 1851           NP            9
2001*PELHAM MDL SCHOOL        4942556  9
2250 2307 2317           NP            9
2410*SPRATTS BILLIARDS        8329693  9
2452*PATRICK RE-CLN BRK       5670232  9
2525 2527 2655 2657      NP            9
2659 2661 2663           NP            9
2665 S A BUTLER              ¤8955874  9
2667 JOY JONES              0 8955040  9
2669 2B71 2677 2679      NP            9
2681 2683 26B5 2687      NP
26B9 2727 2729 2731      NP            9
2970 2972 3626           NP            1
3710*NEW STARLIGT 8PT         8994144  1
     76 RESIDENCE      15 8USINESS     1
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●NAGEL                        48212    1
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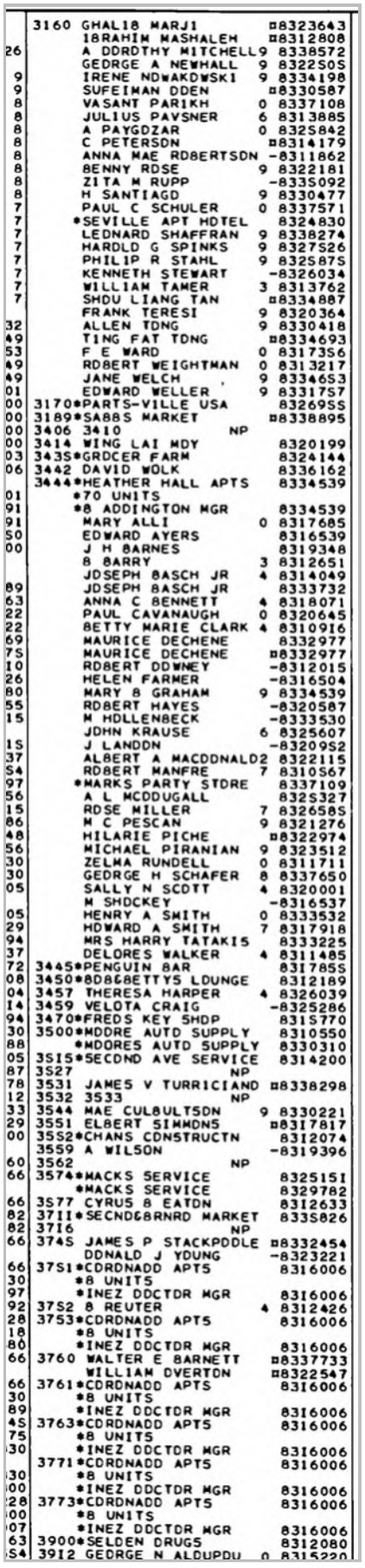
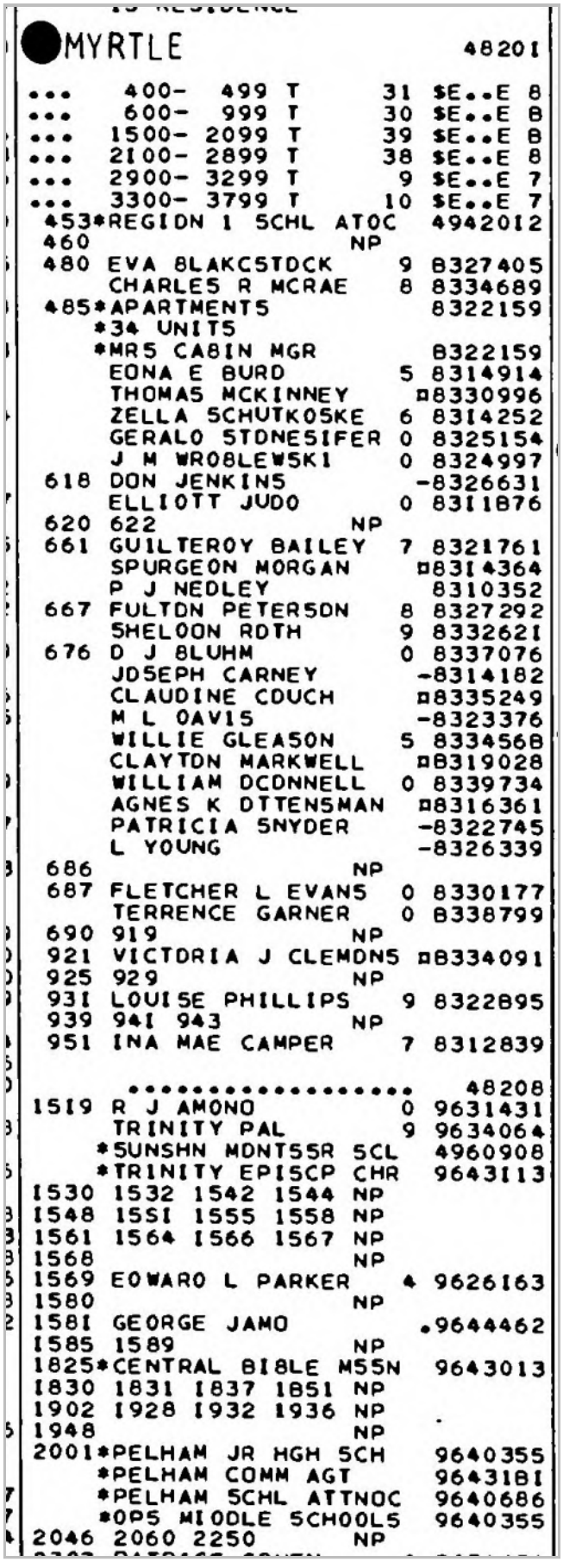
Target Street	Cross Street	Source
✓	-	Bresser's Cross-Index Directory

2ND AVE 1982



Target Street	Cross Street	Source
-	✓	Bresser's Cross-Index Directory

MYRTLE ST 1982



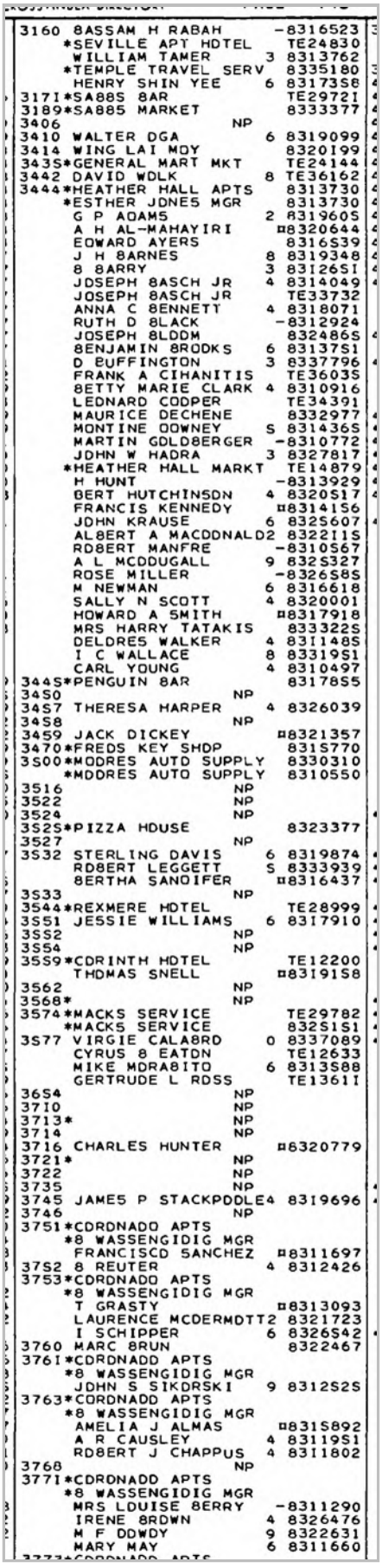
MYRTLE 48201

... 400- 499 T 31 $E..E 8
... 600- 999 T 30 $E..E 8
... 1500- 2099 T 39 $E..E 8
... 2100- 2899 T 38 $E..E 8
... 2900- 3299 T 9 $E..E 7
... 3300- 3799 T 10 $E..E 7
453 *REGIDN 1 5CHL ATOC 4942012
460 NP
480 EVA 8LAKC5TDCK 9 8327405
CHARLE5 R MCRAE 8 8334689
485 *APARTMENT5 8322159
*34 UNIT5
*MR5 CA8IN MGR 8322159
EONA E BURD 5 8314914
THOMA5 MCKINNEY ¤8330996
ZELLA 5CHUTK05KE 6 8314252
GERALO 5TONE5IFER 0 8325154
J M WR08LEW5K1 0 8324997
618 DON JENKIN5 -8326631
ELLIOTT JUDO 0 8311876
620 622 NP
661 GUILTEROY BAILEY 7 8321761
SPURGEON MORGAN ¤8314364
P J NEDLEY 8310352
667 FULTON PETER5ON 8 8327292
5HELOON RDTH 9 8332621
676 D J 8LUHM 0 8337076
JO5EPH CARNEY -8314182
CLAUDINE COUCH ¤8335249
M L OAVI5 -8323376
WILLIE GLEA50N 5 8334568
CLAYTON MARKWELL ¤8319028
WILLIAM OCONNELL 0 8339734
AGNE5 K OTTEN5MAN ¤8316361
PATRICIA 5NYDER -8322745
L YOUNG -8326339
686 NP
687 FLETCHER L EVAN5 0 8330177
TERRENCE GARNER 0 8338799
690 919 NP
921 VICTORIA J CLEMON5 ¤8334091
925 929 NP
931 LOUI5E PHILLIP5 9 8322895
939 941 943 NP
951 INA MAE CAMPER 7 8312839

..... 48208
1519 R J AMONO 0 9631431
TRINITY PAL 9 9634064
*5UN5HN MONT55R 5CL 4960908
*TRINITY EPI5CP CHR 9643113
1530 1532 1542 1544 NP
1548 1551 1555 1558 NP
1561 1564 1566 1567 NP
1568 NP
1569 EOWARO L PARKER 4 9626163
1580 NP
1581 GEORGE JAMO .9644462
1585 1589 NP
1825 *CENTRAL 8I8LE M55N 9643013
1830 1831 1837 1851 NP
1902 1928 1932 1936 NP
1948 NP
2001 *PELHAM JR HGH 5CH 9640355
*PELHAM COMM AGT 9643181
*PELHAM 5CHL ATTNOC 9640686
*OP5 MIODLE 5CHOOL5 9640355
2046 2060 2250 NP

Target Street	Cross Street	Source
✓	-	Bresser's Cross-Index Directory

2ND AVE 1977



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3160 8ASSAM H RABAH          -8316523
    *SEVILLE APT HDTEL        TE24830
     WILLIAM TAMER         3 8313762
    *TEMPLE TRAVEL SERV      8335180
     HENRY SHIN YEE        6 83173S8
3171*SA88S 8AR               TE2972I
3189*SA885 MARKET            8333377
3406                    NP
3410 WALTER DGA           6 8319099
3414 WING LAI MDY            8320199
343S*GENERAL MART MKT        TE24144
3442 DAVID WDLK           8 TE36162
3444*HEATHER HALL APTS       8313730
    *ESTHER JDNES MGR        8313730
     G P ADAMS            2 8319605
     A H AL-MAHAYIRI      ¤8320644
     EDWARD AYERS            8316S39
     J H 8ARNES           8 8319348
     8 8ARRY              3 83126SI
     JDSEPH 8ASCH JR      4 8314049
     JOSEPH 8ASCH JR         TE33732
     ANNA C 8ENNETT       4 8318071
     RUTH D 8LACK          -8312924
     JOSEPH 8LDDM            832486S
     8ENJAMIN 8RODKS      6 83137S1
     D BUFFINGTON         3 8337796
     FRANK A CIHANITIS       TE3603S
     8ETTY MARIE CLARK    4 8310916
     LEDNARD CODPER          TE34391
     MAURICE DECHENE         8332977
     MONTINE DDWNEY       S 831436S
     MARTIN GDLD8ERGER     -8310772
     JDHN W HADRA         3 8327817
    *HEATHER HALL MARKT      TE14879
     H HUNT                -8313929
     8ERT HUTCHINSDN      4 8320S17
     FRANCIS KENNEDY      ¤8314156
     JDHN KRAUSE          6 8325607
     AL8ERT A MACDDNALD2 832211S
     RD8ERT MANFRE         -8310567
     A L MCDDUGALL        9 832S327
     ROSE MILLER           -8326S8S
     M NEWMAN             6 8316618
     SALLY N SCOTT        4 8320001
     HOWARD A SMITH       ¤8317918
     MRS HARRY TATAKIS       833322S
     DELDRES WALKER       4 831148S
     I C WALLACE          8 83319S1
     CARL YOUNG           4 8310497
344S*PENGUIN 8AR             83178S5
3450                    NP
3457 THERESA HARPER       4 8326039
3458                    NP
3459 JACK DICKEY          ¤8321357
3470*FREDS KEY SHDP          831S770
3500*MDDRES AUTD SUPPLY      8330310
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3516                    NP
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3524                    NP
352S*PIZZA HDUSE             8323377
3527                    NP
3532 STERLING DAVIS       6 8319874
     RD8ERT LEGGETT       S 8333939
     8ERTHA SANDIFER      ¤8316437
3533                    NP
3544*REXMERE HDTEL           TE28999
3551 JESSIE WILLIAMS      6 8317910
3552                    NP
3554                    NP
3559*CDRINTH HDTEL           TE12200
     THDMAS SNELL         ¤8319158
3562                    NP
3568*                   NP
3574*MACKS SERVICE            TE29782
    *MACKS SERVICE            832S1S1
3577 VIRGIE CALA8RD       0 8337089
     CYRUS 8 EATDN            TE12633
     MIKE MDRA8ITO        6 8313588
     GERTRUDE L RDSS          TE13611
3654                    NP
3710                    NP
3713*                   NP
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3716 CHARLES HUNTER       ¤8320779
3721*                   NP
3722                    NP
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3745 JAMES P STACKPDDLE4 8319696
3746                    NP
3751*CDRDNADD APTS
    *8 WASSENGIDIG MGR
     FRANCISCD SANCHEZ    ¤8311697
3752 8 REUTER             4 8312426
3753*CDRDNADD APTS
    *8 WASSENGIDIG MGR
     T GRASTY             ¤8313093
     LAURENCE MCDERMDTT2 8321723
     I SCHIPPER           6 8326542
3760 MARC 8RUN               8322467
3761*CDRDNADD APTS
    *8 WASSENGIDIG MGR
     JDHN S SIKDRSKI      9 8312525
3763*CDRDNADD APTS
    *8 WASSENGIDIG MGR
     AMELIA J ALMAS       ¤831S892
     A R CAUSLEY          4 83119S1
     RD8ERT J CHAPPUS     4 8311802
3768                    NP
3771*CDRDNADD APTS
    *8 WASSENGIDIG MGR
     MRS LDUISE 8ERRY      -8311290
     IRENE 8RDWN          4 8326476
     M F DDWDY            9 8322631
     MARY MAY             6 8311660
3773*CDRDNADD APTS
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MYRTLE ST 1977

15 RESIOENCE

MYRTLE 48201

...	400- 499	T	31	$E..E	8
...	600- 999	T	30	$E..E	8
...	1S00- 2099	T	39	$E..E	8
...	2100- 2899	T	38	$E..E	8
...	2900- 3299	T	9	$E..E	7
...	3300- 3799	T	10	$E..E	7

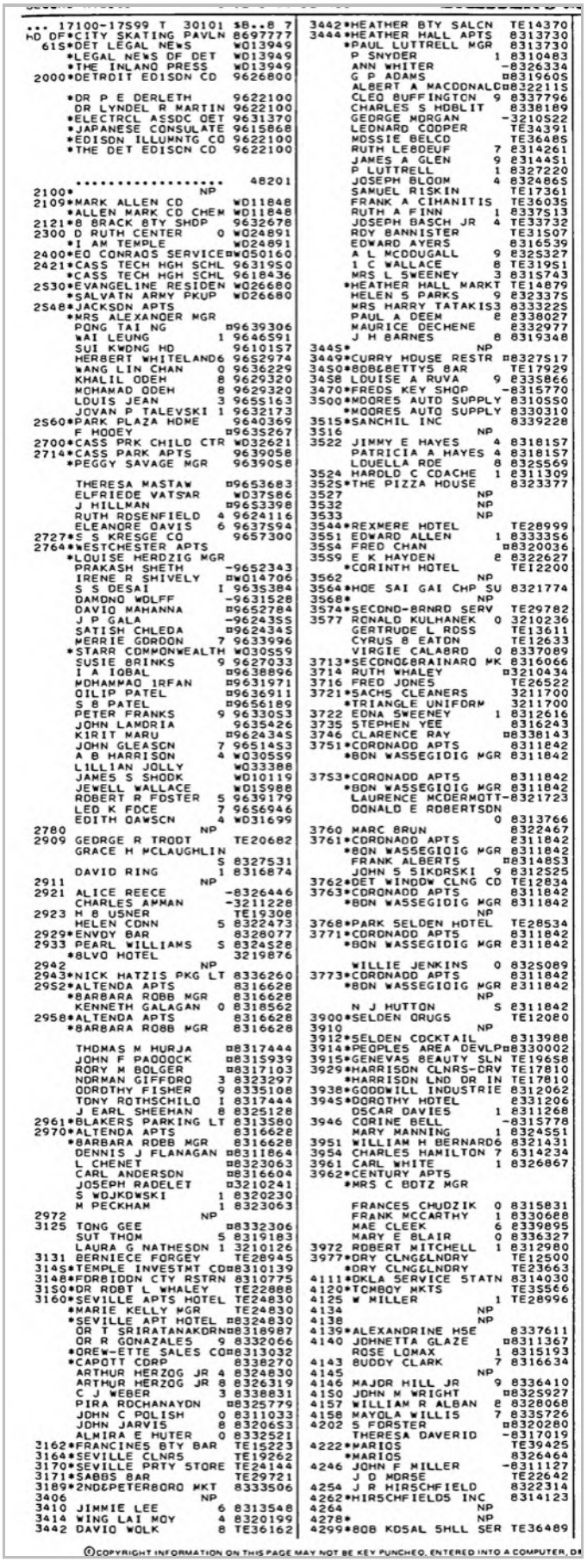
453	*PRACTICAL NRSG CTR		8313810
	*MOOL NGHBHO EO PGM		8322990
	*REGION 1 SCHL ATOC		4942012
460	GRACE WILEY		¤8310434
470	*SALVATION ARMY		8338288
480	JAMES H JARVIS		¤831390S
48S	EONA E 8URO	S	8336862
	LOUIS F CIAVCNE SR		¤8316264
	ESTELLE OARLING		¤8318857
	ERVIN MAURING	4	8339134
	ZELLA SCHUTKOSKE	6	8314252
618	NP		
622	8 GRAY		¤8314543
631	LENORA ALLEN		¤8321540
	ROSE PAYTE		¤8321033
	SHARON KAY SMITH		¤8310354
657	NP		
661	PEARL ALMORE	6	8314786
	GUILTEROY 8AILEY		¤8319298
	WILLIE ORUMMONO		¤8311547
	JAMES J EVANS		¤8316676
	C GRIFFIN	5	8338952
	TERRY C JACKSON		¤8310196
	LALLIE 8 MCCRAY	5	8330364
667	CLIFTON WILLIAMS	5.	8335591
676	CHARLES E OOHRING	6	8314766
	WILLIE GLEASON	S	8334568
	CLAUOINE SICOTE	6	8335249
686	NP		
687	NP		
690	LENIS H GREEN	6	8317270
	OOROTHY SAUNOER	6	8318402
921	FREOOY OEAVES	6	8311878
923	NP		
925	EVELYN RAWLS	6	8334193
941	MRS OAVIO STEPHENS		¤8320122
949	NP		

Target Street	Cross Street	Source
-	✓	Bresser's Cross-Index Directory

MYRTLE ST 1977

951	INA MAE CAMPER		-8312839
	••••••••••••••••••••		48208
1519*	TRINITY EPISCP CHR		9643113
1530	JAMES L RASNICK	5	9631028
1535		NP	
1536		NP	
1537		NP	
1540		NP	
1542		NP	
1547		NP	
1548		NP	
1549		NP	
1551	DAVIO J HORNER		¤9638325
1555	GERALD P OODGE		¤9630618
	OOROTHY RICKARD	6	9630618
1558	SAM TZELEPIS		9646823
1561		NP	
1564		NP	
1566	ODNALO H FARKUS		¤9630861
1567		NP	
1568	OPAL LEMASTER		9645787
1569	EOWARD L PARKER	4	9626163
1573		NP	
1576		NP	
1580	MELVIN WAYNICK		9646497
1581	GEORGE JAMO		•9644462
1585		NP	
1589		NP	
1600*		NP	
1716		NP	
1717		NP	
1737	M A BURBRIOGE		9643239
1739		NP	
1825*	CENTRAL BIBLE MSSN		9643013
	GILBERT VANOONGEN		¤9643013
1830	RAFAEL R RAMIREZ		•9645385
1831		NP	
1836		NP	
1837	ALOEN BLOOM		0•4961072
1851		NP	
1902	EOWARO J SAVAGE		TE11763
1928	EOWARD CHANCE		-8310966
1932	WILLIE M HEMBREE	3	8317536
1936	VIOLA STEPHENS		¤8315929
1948	K OAVIS		-8321196
1950		NP	
2001*	PELHAM GRWTH CTR		9644528

2ND AVE 1972



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*.. 17100-17S99 T  30101 $B..8 7
HD DF*CITY SKATING PAVLN 8697777
  61S*DET LEGAL NEWS      WD13949
     *LEGAL NEWS OF DET   WD13949
     *THE INLAND PRESS    WD13949
2000*DETROIT EDISON CO    9626800

     *DR P E DERLETH      9622100
      DR LYNDEL R MARTIN  9622100
     *ELECTRCL ASSOC DET  9631370
     *JAPANESE CONSULATE  9615868
     *EDISON ILLUMNTG CO  9622100
     *THE DET EDISON CO   9622100


     ****************      48201
2100*                  NP
2109*MARK ALLEN CO        WD11848
     *ALLEN MARK CO CHEM  WD11848
2121*8 BRACK BTY SHOP     9632678
2300 D RUTH CENTER     0  WD24891
     *I AM TEMPLE         WD24891
2400*ED CONRADS SERVICE  WD50160
2421*CASS TECH HGH SCHL   9631950
     *CASS TECH HGH SCHL  9618436
2S30*EVANGELINE RESIDEN  WD26680
     *SALVATN ARMY PKUP   WD26680
2S48*JACKSON APTS
     *MRS ALEXANDER MGR
      PONG TAI NG          #9639306
      WAI LEUNG         1  9646591
      SUI KWONG HO         9610157
      HERBERT WHITELAND6   9652974
      WANG LIN CHAN     0  9636229
      KHALIL ODEH       8  9629320
      MOHAMAD ODEH      8  9629320
      LOUIS JEAN        3  9655163
      JOVAN P TALEVSKI  1  9632173
2S60*PARK PLAZA HOME       9640369
      F HOOEY              #963S267
2700*CASS PRK CHILD CTR  WD32621
2714*CASS PARK APTS        9639058
     *PEGGY SAVAGE MGR     9639058

      THERESA MASTAW       #9653683
      ELFRIEDE VATSAR       WD37586
      J HILLMAN            #963S398
      RUTH ROSENFIELD   4  9624116
      ELEANORE DAVIS    6  9637594
2727*S S KRESGE CO         9657300
2764*WESTCHESTER APTS
     *LOUISE HERDZIG MGR
      PRAKASH SHETH        -9652343
      IRENE R SHIVELY      #W014706
      S S DESAI         I  963S384
      DAMONO WOLFF         -9631528
      DAVID MAHANNA        #9652784
      J P GALA             -962435S
      SATISH CHLEDA        #9624345
      MERRIE GORDON     7  9633996
     *STARR COMMONWEALTH  WD30559
      SUSIE BRINKS      9  9627033
      I A IQBAL            #9638896
      MOHAMMAD IRFAN       #9631971
      DILIP PATEL          #9636911
      S B PATEL            #9656189
      PETER FRANKS      9  963305S
      JOHN LAMDRIA         9635426
      KIRIT MARU           #962434S
      JOHN GLEASON      7  96514S3
      A B HARRISON      4  WD305S9
      LILLIAN JOLLY         WD33388
      JAMES S SHODK         WD10119
      JEWELL WALLACE        WD15988
      ROBERT R FOSTER   5  9639179
      LEO K FOCE        7  9656946
      EDITH OAWSON      4  WD31699
2780                   NP
2909 GEORGE R TROOT        TE20682
     GRACE H MCLAUGHLIN
                        S  8327531
     DAVID RING         1  8316874
2911                   NP
2921 ALICE REECE          -8326446
     CHARLES AMMAN        -3211228
2923 H B USNER             TE19308
     HELEN CONN         5  8322473
2929*ENVOY BAR             8328077
2933 PEARL WILLIAMS     S  8324S28
     *BLVD HOTEL           3219876
2942                   NP
2943*NICK HATZIS PKG LT   8336260
29S2*ALTENDA APTS          8316628
     *BARBARA ROBB MGR     8316628
      KENNETH GALAGAN   0  8318562
2958*ALTENDA APTS          8316628
     *BARBARA ROBB MGR     8316628

      THOMAS M HURJA       #8317444
      JOHN F PADDOCK       #831S939
      RORY M BOLGER        #8317103
      NORMAN GIFFORD    3  8323297
      DOROTHY FISHER    9  8335108
      TONY ROTHSCHILD   I  8317444
      J EARL SHEEHAN    8  83251Z8
2961*BLAKERS PARKING LT   8313580
2970*ALTENDA APTS          8316628
     *BARBARA ROBB MGR     8316628
      DENNIS J FLANAGAN    #8311864
      L CHENET             #8323063
      CARL ANDERSON        #8316604
      JOSEPH RADELET       #3210241
      S WOJKOWSKI       1  8320230
      M PECKHAM         1  8323063
2972                   NP
3125 TONG GEE              #8332306
      SUT THOM          5  8319183
      LAURA G NATHESON  1  3210126
3131 BERNIECE FORGEY       TE28945
314S*TEMPLE INVESTMT CO   #8310139
3148*FORBIDDN CTY RSTRN   8310775
31S0*DR ROBT L WHALEY      TE22888
3160*SEVILLE APTS HOTEL   TE24830
     *MARIE KELLY MGR      TE24830
     *SEVILLE APT HOTEL   #8324830
      DR T SRIRATANAKORN  #8318987
      DR R GONZALES     9  8332066
     *DREW-ETTE SALES CO  #8313032
     *CAPOTT CORP          8338270
      ARTHUR HERZOG JR  4  8324830
      ARTHUR HERZOG JR  8  8326319
      C J WEBER         3  8338831
      PIRA ROCHANAYON      #8325779
      JOHN C POLISH     0  8311033
      JOHN JARVIS       8  8320653
      ALMIRA E HUTER    0  8332521
3162*FRANCINES BTY BAR    TE15223
3164*SEVILLE CLNRS        TE19262
3170*SEVILLE PRTY STORE   TE24144
3171*SABBS BAR            TE29721
3189*2ND&PETERBORO MKT    8333506
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3410 JIMMIE LEE           6 8313548
3414 WING LAI MOY         4 8320199
3442 DAVID WOLK           8 TE36162
3442*HEATHER BTY SALON    TE14370
3444*HEATHER HALL APTS    8313730
     *PAUL LUTTRELL MGR   8313730
      P SNYDER          1  8310483
      ANN WHITER           -8326334
      G P ADAMS            #831960S
      ALBERT A MACDONALD  #832211S
      CLEO BUFFINGTON   9  8337796
      CHARLES S HOBLIT     8338189
      GEORGE MORGAN        -3210S22
      LEONARD COOPER       TE34391
      MOSSIE BELCO         TE3648S
      RUTH LEBOEUF      7  8314261
      JAMES A GLEN      9  8314451
      P LUTTRELL        1  8327220
      JOSEPH BLOOM      4  832486S
      SAMUEL RISKIN        TE17361
      FRANK A CIHANITIS    TE3603S
      RUTH A FINN       1  8337S13
      JOSEPH BASCH JR   4  TE33732
      ROY BANNISTER        TE31S07
      EDWARD AYERS         8316539
      A L MCDOUGALL     9  8325327
      1 C WALLACE       8  TE31951
      MRS L SWEENEY     3  831S743
     *HEATHER HALL MARKT   TE14879
      HELEN S PARKS     9  832337S
      MRS HARRY TATAKIS3  833322S
      PAUL A DEEM       2  8338027
      MAURICE DECHENE      8332977
      J H BARNES        8  8319348
344S*                  NP
3449*CURRY HOUSE RESTR   #8327S17
34S0*BOB&BETTYS BAR       TE17929
34S8 LOUISE A RUVA        9 833S866
3470*FREDS KEY SHOP      -8315770
3S00*MOORES AUTO SUPPLY   8310S50
     *MOORES AUTO SUPPLY  8330310
3515*SANCHIL INC          8339228
3516                   NP
3522 JIMMY E HAYES        4 8318157
     PATRICIA A HAYES     4 8318157
     LOUELLA ROE          8 832S569
3524 HAROLD C CDACHE      1 8311309
3525*THE PIZZA HOUSE      8323377
3527                   NP
3532                   NP
3533                   NP
3544*REXMERE HOTEL         TE28999
3551 EDWARD ALLEN         1 8333356
35S4 FRED CHAN           #8320036
35S9 E K HAYDEN           2 8322627
     *CORINTH HOTEL        TE12200
3562                   NP
3564*HOE SAI GAI CHP SU   8321774
3568*                  NP
3574*SECOND-BRNRD SERV    TE29782
3577 RONALD KULHANEK      0 3210236
      GERTRUDE L ROSS      TE13611
      CYRUS B EATON        TE12633
      VIRGIE CALABRO    0  8337089
3713*SECOND&BRAINARD MK   8316066
3714 RUTH WHALEY          #3210434
3716 FRED JONES           TE26522
3721*SACHS CLEANERS       3211700
     *TRIANGLE UNIFORM     3211700
3722 EDNA SWEENEY         1 8312616
3735 STEPHEN YEE          8 8316243
3746 CLARENCE RAY         #8338143
3751*CORONADO APTS        8311842
     *BON WASSEGIDIG MGR  8311842

37S3*CORONADO APTS        8311842
     *BON WASSEGIDIG MGR  8311842
      LAURENCE MCDERMOTT-8321723
      DONALD E ROBERTSON
                        0  8313766
3760 MARC BRUN            8322467
3761*CORONADO APTS        8311842
     *BON WASSEGIDIG MGR  8311842
      FRANK ALBERTS       #8314853
      JOHN S SIKORSKI   9  8312525
3762*DET WINDOW CLNG CO   TE12834
3763*CORONADO APTS        8311842
     *BON WASSEGIDIG MGR  8311842
                        NP
3768*PARK SELDEN HOTEL    TE28534
3771*CORONADO APTS        8311842
     *BON WASSEGIDIG MGR  8311842

      WILLIE JENKINS    0  832S089
3773*CORONADO APTS        8311842
     *BON WASSEGIDIG MGR  8311842
                        NP
      N J HUTTON        S  8311842
3900*SELDEN DRUGS         TE12080
3910                   NP
3912*SELDEN COCKTAIL      8313988
3914*PEOPLES AREA DEVLP  #8330002
3915*GENEVAS BEAUTY SLN   TE19658
3929*HARRISON CLNRS-DRY   TE17810
     *HARRISON LND DR IN  TE17810
3938*GOODWILL INDUSTRIE   8312062
394S*DOROTHY HOTEL        2331206
      OSCAR DAVIES      1  8311268
3946 CORINE BELL          -831S778
      MARY MANNING      1  8324S51
3951 WILLIAM H BERNARD6   8321431
3954 CHARLES HAMILTON 7   8314234
3961 CARL WHITE           1 8326867
3962*CENTURY APTS
     *MRS C BOTZ MGR

      FRANCES CHUDZIK   0  8315831
      FRANK MCCARTHY    1  8330688
      MAE CLEEK         6  8339895
      MARY E BLAIR      0  8336327
3972 ROBERT MITCHELL      1 8312980
3977*DRY CLNG&LNDRY       TE12500
     *DRY CLNG&LNDRY      TE23663
4111*DKLA SERVICE STATN   8314030
4120*TOMBOY MKTS          TE3S566
4125 W MILLER             1 TE28996
4134                   NP
4138                   NP
4139*ALEXANDRINE HSE      8337611
4140 JOHNETTA GLAZE      #8311367
      ROSE LOMAX        1  8315193
4143 BUDDY CLARK          7 8316634
4145                   NP
4146 MAJOR HILL JR        9 8336410
41S0 JOHN M WRIGHT       #832S927
4157 WILLIAM R ALBAN      2 8328068
4158 MAYOLA WILLIS        7 8335726
4202 S FORSTER           #8320280
      THERESA DAVERID     -8317019
4222*MARIOS               TE39425
     *MARIOS              8326464
4246 JOHN F MILLER       -8311127
      J D MORSE           TE22642
4254 J R HIRSCHFIELD      8322314
4262*HIRSCHFIELDS INC     8314123
4264                   NP
4278*                  NP
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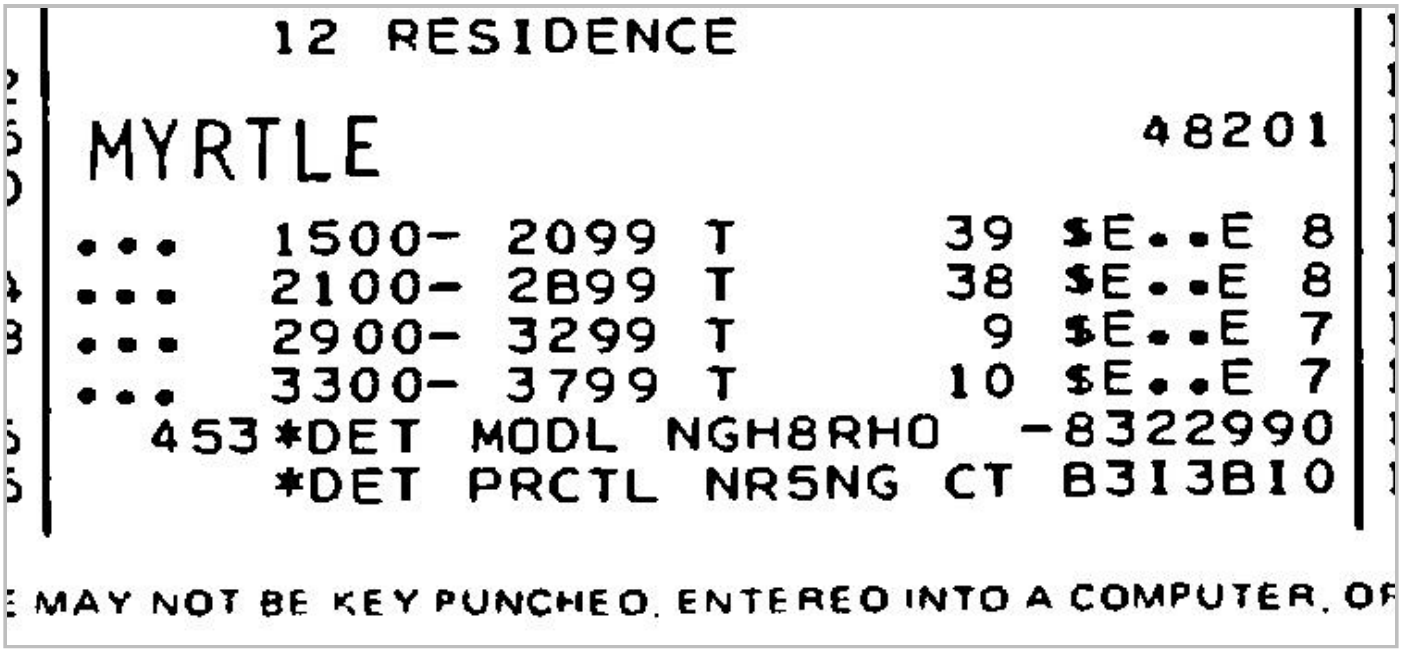
MYRTLE ST 1972



Target Street	Cross Street	Source
-	✓	Bresser's Cross-Index Directory

MYRTLE ST 1972

470*	SALVATION ARMY		¤8336288
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1519*	TRINITY EPISCP CHR		9643113
1530	ETHYL DEMUTH	S	8321791
1535		NP	
1540		NP	
1542	A M MCGLOTHLIN	8	8335457
1548	JAMES NUNNERY	0	8313392
1549		NP	
1551		NP	
1558	SAM TZELEPIS		TE11488
1561	THEODORE KIOUSIS	8	9644575
1564		NP	
1566	JOHN FALCONER		8326535
1568	OPAL LE MASTER	6	8322781
1569		NP	
1573	P FOUNTEAS		•9644935
1576		NP	
1580	MELVIN WAYNICK		8324255
	LULA PERRY	0	8327784
1581	GEORGE JAMO		•9644462
1585		NP	
1589		NP	
1600*	MARTIN HTL BAR		TE28711
1716		NP	
1717		NP	
1724*	KENNYS LOUNGE		8329632
1737	MARTHA A BURBRIDGE		9643239
1825*	NESS MEML MISSION		8313013
	GILBERT VAN DONGEN	5	8313013
1830	RAFAEL R RAMIREZ		•TE13968
1831		NP	
1836		NP	
1837	ALDEN BLOOM	0	•8316593
1851*	MCCOY CONST CO		TE14500
1902	EDWARD J SAVAGE		TE11763
1936	BUFORD GAMBRELL	0	8335122
1950		NP	
2001*	PELHAM ATTND OFC		8324660

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2ND AVE 1967

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      FRED VAN POPERING   TE22329
2958*ALTENDA APTS         8316628
     *M J PHILIPS MGR     8316628
      THOMAS H ROBINSON  -8311713
      STEVE PACZKOWSKI   ¤8315496
      NORMAN GIFFORD    3 8323297
      ALBERT J REUTER   3 8324088
      J EARL SHEEHAN    3 8325128
      IRENE FOLEY         TE19137
2961*BLAKERS PARKING LT   8313580
2966 JACK NICHOLSON SR    TE12863
2970*ALTENDA APTS         8316628
     *M J PHILIPS MGR     8316628
      FLORENCE A MARTIN   TE27725
      KARL E ANDERSON     TE27787
      ORPHA ANDERSON    5 8312695
      MILDRED V PHILLIPS
                        3 8316628
      HENRY T BELL      4 3210178
      CHARLIE YOUNG     4 3210318
.....  3100- 4099 TZ   30 $E..E 8
3125 SUT THOM           5 8319183
3131 BERNIECE FORGEY      TE28945
3145 O A FERGUSON       ¤8332243
      MYRTLE GOREKI     6 8320982
3148*FORBIDDN CTY RSTRN   8310775
3150*DR GEORGE MOGILL     TE31876
     *DR ROBT L WHALEY    TE22888
3159 JOSEPH DIMITRI       TE16827
3160*SEVILLE APT HTL      TE24830
     *G H NEWMAN MGR      TE24830
      FAUSTINA M VIVIANO
                        2 8331293
     *CAPOTT CORP        ¤8338270
      C J WEBER         3 8338831
     *SEVILLE HTL BARBER  8328616
      FREDRICK PRICE     -8330283
      DR BALA S PRASAD   -8313342
      JULIUS PAVSNER    4 8313885
      W C MELLENDER     3 8311039
     *CAPOTT CORP        ¤TE24830
      ARTHUR HERZOG JR  3 8324830
     *SEVILLE APT HOTEL   8324830
      GINNY A SIBERT     -8320128
      RICHARD J COON    6 8320848
3162*FRANCINES BTY BAR  ¤TE15223
3164*SEVILLE CLNRS        TE19262
3170*SEVILLE PRTY STORE   TE24144
3171*SABBS BAR            TE29721
3189*SECOND & PTRBRO MK   TE28255
3406                  NP
3409 FOUNT BRYANT       ¤8318241
      TOM CAMPBELL      6 8324539
3410 JIMMIE LEE         6 8313548
3414 WING LAI MOY       4 8320199
3442*HEATHER BTY SALON    TE14370
3444*HEATHERHALL APTS     TE13730
     *JAMES DUNCAN MGR    TE13730
      RUTH LEBOEUF       ¤8314261
      ROY BANNISTER     8 TE31507
      IDA C WALLACE       TE31951
      H G FULLER        1 TE32743
      JAMES E DATTILIO   ¤8332797
      MAURICE DECHENE   0 TE32977
      HARRY TATAKIS     3 8333225
      JOSEPH BASCH JR   4 TE33732
      LEONARD COOPER    0 TE34391
      FRANK A CIHANITIS   TE36035
      MOSSIE BELCO        TE36485
      CHARLES S HOBLIT 2 8338189
      BERNICE MAKOSKI    ¤8313739
     *HEATHER HALL MARKT  TE14879
      CARMEN D DATILIO   ¤8315593
      MRS L SWEENEY     3 8315743
      PAT KELLY         5 8310209
      EDWARD AYERS      2 8316539
      SAMUEL RISKIN     9 TE17361
      AL BUCHOLSKI      5 8323504
      J STEWART ASHER    ¤8324327
      JOSEPH BLOOM      4 8324865
      MICHAEL HORNICK   5 8326365
      FLO OPPENHEIMER     8320118
      GEORGE J LEE      6 8321365
      GEORGE C BEAN     6 8322239
3450*VANCES BAR           TE17929
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2ND AVE 1967

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3457                    NP
3458                    NP
3500*MOORES AUTO SUPPLY 8310550
3515*RUSS TIRE&BATTERY ¤8329272
3516 CLARENCE MARSHALL ¤8311215
3522 JIMMY E HAYES     4 8318157
     PATRICIA A HAYES  4 8318157
3525*THE PIZZA HOUSE     8323377
3527                    NP
3532                    NP
3533                    NP
3534*IDEAL LAUNDRY       8325042
3544*REXMERE HOTEL       TE28999
     E M BARGFREDE     6 3210087
3545 DELORIA DURHAM     ¤8334559
     MARY NEWTON        ¤8336537
     FRANK MARZETT      4 8314182
     G G TROUPE JR      6 8314814
3550*ABE THE TAILOR      TE18400
    *ABE WARSHAWSKY TLR TE18400
3559*CORINTH HOTEL       TE12200
3562 ARAM KEVORKIAN     ¤8328064
3564*HOE SAI GAI CHP SU¤8321774
     JERRY YEE          ¤8321774
3568*DUCAT BAR           TE39418
3574*SECOND BRNRD SERV   TE29782
3577 VIVIAN J ADKINS    ¤8311912
     GERTRUDE L ROSS     TE13611
     ELIZABETH MALAK   2 TE14592
     CYRUS B EATON     9 TE12633
     ANCLE KELLY       -8322929
3710 CLARA CHARETTE      TE16369
3713*SECOND&BRAINARD MK 8316066
3714 CASIANO RECANIA    ¤8330964
     ESSIE PARE        5 8317355
3716 FRED JONES          TE26522
3721*SACHS CLNRS&LNDRY   TE28871
3722                    NP
3729                    NP
3735                    NP
3745 MARGARET SHEEHAN   -8315195
     STEPHEN YEE         TE16243
3746 ROBERT BRUCE      6 8330251
3751*CORONADO APTS
    *NMIA
3752                    NP
3753 G O AYERS         6 TE21899
3760 MARC BRUN           TE22467
3761 ANN CAMPBELL       ¤8311471
3762*DET WINDOW CLNG CO TE12834
3763 EDGAR MUSCAT        TE34899
3768*OLIVIA HOTEL        TE28534
3771 ALICE CHAPMAN     1 TE25041
3773*CORONADO APTS
    *NMIA
     MAY PAQUETTE      2 8337610
     N J HUTTON        5 8311842
    *DR I H FRIEDMAN     TE14444
     HELEN BERNAUER    0 8325007
3900*SELDEN DRUG CO       TE12080
3905*WARWICK HOTEL        8339062
    *MR WILKINSON MGR     8339062
     EDDIE BROADUS      ¤8332335
     FRANK J ALLEN      ¤8332832
     PETER T WILKERSON  ¤8339062
     JOHN WILBERN      4 8312808
     N ARMSTRONG       6 8314706
     NATHANIEL HARDY   6 8315839
     L B HARDAWAY       ¤8316790
     WILLIAM MCMILLAN   ¤8318646
     ORMAN C MOORE     5 8323087
     MILTON MOORE      4 8323328
     KIT WILSON        6 8325144
     DOROTHY CLARK      ¤8326318
     LOUIS SPEARS       ¤8320797
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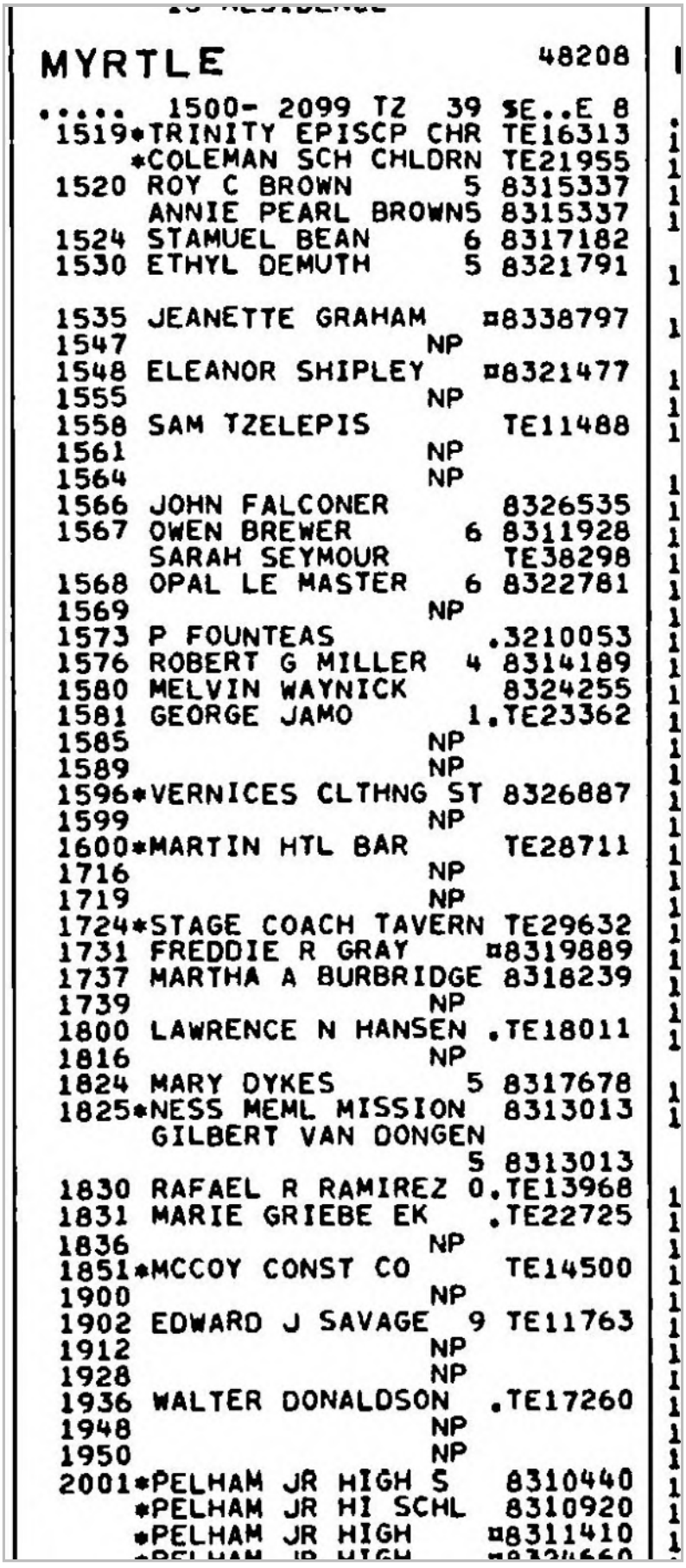
-	✓	Bresser's Cross-Index Directory

MYRTLE ST 1967



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MYRTLE                                  48208

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1519*TRINITY EPISCP CHR TE16313
    *COLEMAN SCH CHLDRN TE21955
1520 ROY C BROWN         5 8315337
     ANNIE PEARL BROWN   5 8315337
1524 STAMUEL BEAN        6 8317182
1530 ETHYL DEMUTH        5 8321791

1535 JEANETTE GRAHAM    ¤8338797
1547                    NP
1548 ELEANOR SHIPLEY    ¤8321477
1555                    NP
1558 SAM TZELEPIS        TE11488
1561                    NP
1564                    NP
1566 JOHN FALCONER       8326535
1567 OWEN BREWER         6 8311928
     SARAH SEYMOUR       TE38298
1568 OPAL LE MASTER      6 8322781
1569                    NP
1573 P FOUNTEAS          .3210053
1576 ROBERT G MILLER     4 8314189
1580 MELVIN WAYNICK       8324255
1581 GEORGE JAMO         1.TE23362
1585                    NP
1589                    NP
1596*VERNICES CLTHNG ST  8326887
1599                    NP
1600*MARTIN HTL BAR        TE28711
1716                    NP
1719                    NP
1724*STAGE COACH TAVERN  TE29632
1731 FREDDIE R GRAY     ¤8319889
1737 MARTHA A BURBRIDGE  8318239
1739                    NP
1800 LAWRENCE N HANSEN  .TE18011
1816                    NP
1824 MARY DYKES          5 8317678
1825*NESS MEML MISSION   8313013
     GILBERT VAN DONGEN
                         5 8313013
1830 RAFAEL R RAMIREZ   0.TE13968
1831 MARIE GRIEBE EK    .TE22725
1836                    NP
1851*MCCOY CONST CO       TE14500
1900                    NP
1902 EDWARD J SAVAGE     9 TE11763
1912                    NP
1928                    NP
1936 WALTER DONALDSON   .TE17260
1948                    NP
1950                    NP
2001*PELHAM JR HIGH S     8310440
    *PELHAM JR HI SCHL    8310920
    *PELHAM JR HIGH      ¤8311410
    *PELHAM JR HIGH      ¤8324660
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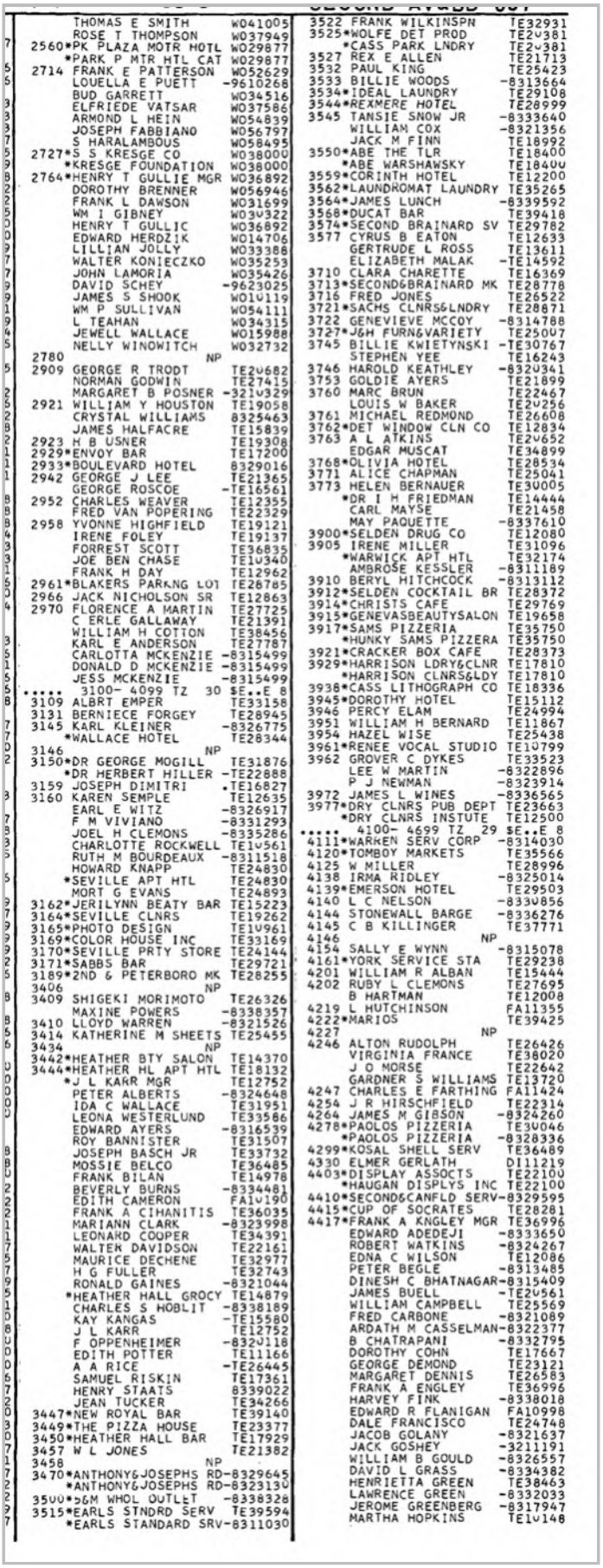
2ND AVE 1962



THOMAS E SMITH W041005
ROSE T THOMPSON W037949
2560 *PK PLAZA MOTR HOTL W029877
*PARK P MTR HTL CAT W029877
2714 FRANK E PATTERSON W052629
LOUELLA E PUETT -9610268
BUD GARRETT W034516
ELFRIEDE VATSAR W037586
ARMOND L HEIN W054839
JOSEPH FABBIANO W056797
S HARALAMBOUS W058495
2727 *S S KRESGE CO W038000
*KRESGE FOUNDATION W038000
2764 *HENRY T GULLIE MGR W036892
DOROTHY BRENNER W056946
FRANK L DAWSON W031699
WM I GIBNEY W030322
HENRY T GULLIC W036892
EDWARD HERDZIK W014706
LILLIAN JOLLY W033388
WALTER KONIECZKO W035253
JOHN LAMORIA W035426
DAVID SCHEY -9623025
JAMES S SHOOK W010119
WM P SULLIVAN W054111
L TEAHAN W034315
JEWELL WALLACE W015988
NELLY WINOWITCH W032732
2780 NP
2909 GEORGE R TRODT TE20682
NORMAN GODWIN TE27415
MARGARET B POSNER -3210329
2921 WILLIAM Y HOUSTON TE19058
CRYSTAL WILLIAMS 8325463
JAMES HALFACRE TE15839
2923 H B USNER TE19308
2929 *ENVOY BAR TE17200
2933 *BOULEVARD HOTEL 8329016
2942 GEORGE J LEE TE21365
GEORGE ROSCOE -TE16561
2952 CHARLES WEAVER TE12355
FRED VAN POPERING TE22329
2958 YVONNE HIGHFIELD TE19121
IRENE FOLEY TE19137
FORREST SCOTT TE36835
JOE BEN CHASE TE10340
FRANK H DAY TE12962
2961 *BLAKERS PARKNG LOT TE28785
2966 JACK NICHOLSON SR TE12863
2970 FLORENCE A MARTIN TE27725
C ERLE GALLAWAY TE21391
WILLIAM H COTTON TE38456
KARL E ANDERSON TE27787
CARLOTTA MCKENZIE -8315499
DONALD D MCKENZIE -8315499
JESS MCKENZIE -8315499
**** 3100- 4099 TZ 30 $E..E 8
3109 ALBRT EMPER TE33158
3131 BERNIECE FORGEY TE28945
3145 KARL KLEINER -8326775
*WALLACE HOTEL TE28344
3146 NP
3150 *DR GEORGE MOGILL TE31876
*DR HERBERT HILLER -TE22888
3159 JOSEPH DIMITRI -TE16827
3160 KAREN SEMPLE TE12635
EARL E WITZ -8326917
F M VIVIANO -8331293
JOEL H CLEMONS -8335286
CHARLOTTE ROCKWELL TE10561
RUTH M BOURDEAUX -8311518
HOWARD KNAPP TE24830
*SEVILLE APT HTL TE24830
MORT G EVANS TE24893
3162 *JERILYNN BEATY BAR TE15223
3164 *SEVILLE CLNRS TE19262
3165 *PHOTO DESIGN TE10961
3169 *COLOR HOUSE INC TE33169
3170 *SEVILLE PRTY STORE TE24144
3171 *SABBS BAR TE29721
3189 *2ND & PETERBORO MK TE28255
3406 NP
3409 SHIGEKI MORIMOTO TE26326
MAXINE POWERS -8338357
3410 LLOYD WARREN -8321526
3414 KATHERINE M SHEETS TE25455
3434 NP
3442 *HEATHER BTY SALON TE14370
3444 *HEATHER HL APT HTL TE18132
*J L KARR MGR TE12752
PETER ALBERTS -8324648
IDA C WALLACE TE31951
LEONA WESTERLUND TE33586
EDWARD AYERS -8316539
ROY BANNISTER TE31507
JOSEPH BASCH JR TE33732
MOSSIE BELCO TE36485
FRANK BILAN TE14978
BEVERLY BURNS -8334481
EDITH CAMERON FA10190
FRANK A CIHANITIS TE36035
MARIANN CLARK -8323998
LEONARD COOPER TE34391
WALTER DAVIDSON TE22161
MAURICE DECHENE TE32977
H G FULLER TE32743
RONALD GAINES -8321044
*HEATHER HALL GROCY TE14879
CHARLES S HOBLIT -8338189
KAY KANGAS -TE15580
J L KARR TE12752
F OPPENHEIMER -8320118
EDITH POTTER TE11166
A A RICE -TE26445
SAMUEL RISKIN TE17361
HENRY STAATS 8339022
JEAN TUCKER TE34266
3447 *NEW ROYAL BAR TE39140
3449 *THE PIZZA HOUSE TE23377
3450 *HEATHER HALL BAR TE17929
3457 W L JONES TE21382
3458 NP
3470 *ANTHONY&JOSEPHS RD-8329645
*ANTHONY&JOSEPHS RD-8323130
3500 *J&M WHOL OUTLET -8338328
3515 *EARLS STNDRD SERV TE39594
*EARLS STANDARD SRV-8311030
3522 FRANK WILKINSPN TE32931
3525 *WOLFE DET PROD TE20381
*CASS PARK LNDRY TE20381
3527 REX E ALLEN TE21713
3532 PAUL KING TE25423
3533 BILLIE WOODS -8313664
3534 *IDEAL LAUNDRY TE29108
3544 *REXMERE HOTEL TE28999
3545 TANSIE SNOW JR -8333640
WILLIAM COX -8321356
JACK M FINN TE18992
3550 *ABE THE TLR TE18400
*ABE WARSHAWSKY TE18400
3559 *CORINTH HOTEL TE12200
3562 *LAUNDROMAT LAUNDRY TE35265
3564 *JAMES LUNCH -8339592
3568 *DUCAT BAR TE39418
3574 *SECOND BRAINARD SV TE29782
3577 CYRUS B EATON TE12633
GERTRUDE L ROSS TE13611
ELIZABETH MALAK -TE14592
3710 CLARA CHARETTE TE16369
3713 *SECOND&BRAINARD MK TE28778
3716 FRED JONES TE26522
3721 *SACHS CLNRS&LNDRY TE28871
3722 GENEVIEVE MCCOY -8314788
3727 *J&H FURN&VARIETY TE25007
3745 BILLIE KWIETYNSKI -TE30767
STEPHEN YEE TE16243
3746 HAROLD KEATHLEY -8320341
3753 GOLDIE AYERS TE21899
3760 MARC BRUN TE22467
LOUIS W BAKER TE20256
3761 MICHAEL REDMOND TE26608
3762 *DET WINDOW CLN CO TE12834
3763 A L ATKINS TE20652
EDGAR MUSCAT TE34899
3768 *OLIVIA HOTEL TE28534
3771 ALICE CHAPMAN TE25041
3773 HELEN BERNAUER TE30005
*DR I M FRIEDMAN TE14444
CARL MAYSE TE21458
MAY PAQUETTE -8337610
3900 *SELDEN DRUG CO TE12080
3905 IRENE MILLER TE31096
*WARWICK APT HTL TE32174
AMBROSE KESSLER -8311189
3910 BERYL HITCHCOCK -8313112
3912 *SELDEN COCKTAIL BR TE28372
3914 *CHRISTS CAFE TE29769
3915 *GENEVASBEAUTYSALON TE19658
3917 *SAMS PIZZERIA TE35750
*HUNKY SAMS PIZZERA TE35750
3921 *CRACKER BOX CAFE TE28373
3929 *HARRISON LDRY&CLNR TE17810
*HARRISON CLNRS&LDY TE17810
3938 *CASS LITHOGRAPH CO TE18336
3945 *DOROTHY HOTEL TE15112
3946 PERCY ELAM TE24994
3951 WILLIAM H BERNARD TE11867
3954 HAZEL WISE TE25438
3961 *RENEE VOCAL STUDIO TE10799
3962 GROVER C DYKES TE33523
LEE W MARTIN -8322896
P J NEWMAN -8323914
3972 JAMES L WINES -8336565
3977 *DRY CLNRS PUB DEPT TE23663
*DRY CLNRS INSTUTE TE12500
**** 4100- 4699 TZ 29 $E..E 8
4111 *WARREN SERV CORP -8314030
4120 *TOMBOY MARKETS TE35566
4125 W MILLER TE28996
4138 IRMA RIDLEY -8325014
4139 *EMERSON HOTEL TE29503
4140 L C NELSON -8330856
4144 STONEWALL BARGE -8336276
4145 C B KILLINGER TE37771
4146 NP
4154 SALLY E WYNN -8315078
4161 *YORK SERVICE STA TE29238
4201 WILLIAM R ALBAN TE15444
4202 RUBY L CLEMONS TE27695
B HARTMAN TE12008
4219 L HUTCHINSON FA11355
4222 *MARIOS TE39425
4227 NP
4246 ALTON RUDOLPH TE26426
VIRGINIA FRANCE TE38020
J O MORSE TE22642
GARDNER S WILLIAMS TE13720
4247 CHARLES E FARTHING FA11424
4254 J R HIRSCHFIELD TE22314
4264 JAMES M GIBSON -8324260
4278 *PAOLOS PIZZERIA TE30046
*PAOLOS PIZZERIA -8328336
4299 *KOSAL SHELL SERV TE36489
4330 ELMER GERLATH DI11219
4403 *DISPLAY ASSOCTS TE22100
*HAUGAN DISPLYS INC TE22100
4410 *SECOND&CANFLD SERV -8329595
4415 *CUP OF SOCRATES TE28281
4417 *FRANK A KNGLEY MGR TE36996
EDWARD ADEDEJI -8333650
ROBERT WATKINS -8324267
EDNA C WILSON TE12086
PETER BEGLE -8313485
DINESH C BHATNAGAR -8315409
JAMES BUELL -TE20561
WILLIAM CAMPBELL TE25569
FRED CARBONE -8321089
ARDATH M CASSELMAN -8322377
B CHATRAPANI -8332795
DOROTHY COHN TE17667
GEORGE DEMOND TE23121
MARGARET DENNIS TE26583
FRANK A ENGLEY TE36996
HARVEY FINK -8338018
EDWARD R FLANIGAN FA10998
DALE FRANCISCO TE24748
JACOB GOLANY -8321637
JACK GOSHEY -3211191
WILLIAM B GOULD -8326557
DAVID L GRASS -8334382
HENRIETTA GREEN TE38463
LAWRENCE GREEN -8332033
JEROME GREENBERG -8317947
MARTHA HOPKINS TE10148

Target Street	Cross Street	Source
✓	-	Bresser's Cross-Index Directory

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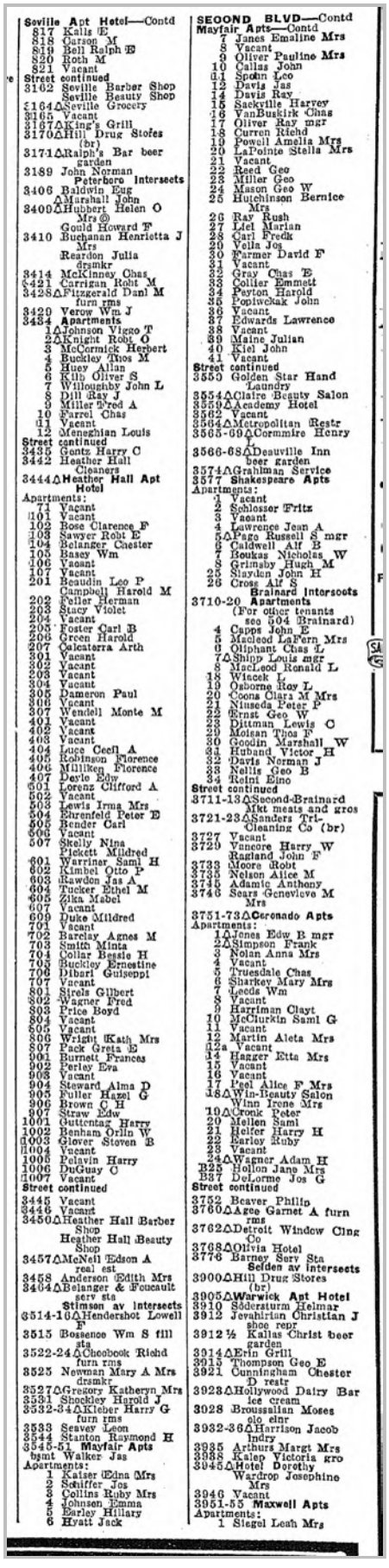
	IRENE FOLEY	TE1-9137
2966	JACK NICHOLSON SR	TE1-2863
2970	CHESTER E BUSIC	TE1-1645
	FLORENCE A MARTIN	TE2-7725
	KARL E ANOERSON	TE2-7787
	C ERLE GALLAWAY	TE2-1391
	WILLIAM H COTTON	□TE3-8456
	DEMITRA C CASE	TE1-4788
3109	ALBRT EMPER	TE3-3158
3125	CLARENCE STINSON	□TE3-0837
3130	MARY RIPKEN	TE2-3779
3145	*WALLACE HOTEL	TE2-8344
3150	*GEO MOGILL MD	TE3-1876
	*DDS C DITKOFF	TE1-9830
3159	JOSEPH DIMITRI	TE1-6827
3160	HOWARD KNAPP	TE2-4830
	*SEVILLE APT HTL	TE2-4830
	ARTHUR HERZOG JR	TE2-4830
	MORT G EVANS	TE2-4893
	DONALD J KARLE	TE1-7162
	THOMAS TUDMAN	□TF2-7632
3162	*SEVILLE BTY SHOPPE	FA1-0266
3164	*SEVILLE CLNRS	TE1-9262
3170	*SEVILLE PHARMACY	TE2-9214
3171	*SABBS BAR	TE2-9721
3189	*SECOND MKT	TE2-8255
3410	LLOYD WARREN	FA1-0234
3414	KATHERINE M SHEETS	TE2-5455
3444	EDITH POTTER	TE1-1166
	ROYCE MURRELL	TE1-1310
	WALTER DAVIDSON	TE2-2161
	ELIA FRANGO	TE2-1259
	*HEATHR HLL APT HTL	TE1-8132
	VIOLET V WOOD	TE1-8669
	*HEATHER HALL CLNRS	TE2-9469
	FRANK BILAN	TE1-4978
	SAMUEL RISKIN	TE1-7361
	WILFORD RIDENER	TE1-7596
	RUTH L ROSS	TE3-7456
	GLENN DAVIS	□FA1-1795
	ESTHER ANTHONY	□TE3-3970
	VICTORIA FERRELL	□TE3-4135
	LILLIAN LAWSON	□TE3-4298
	MOSSIE BELCO	TE3-6485
	KARI HAUGE	□TE3-1267
	JAMES STRINGER	□TE3-2441
	MARIAN KOZLOWSKI	□TE2-7293
	R C SPILLMAN	□TE3-8068
	H L MARTIN	□TE3-9142
	JAMES C BELFOR	□TE2-3118
	ROLAND RANDOLPH	□TE2-6247
	HELEN CAMP	□TE2-1916
	ROBERT B TATHAM	□TE2-2351
	GEORGE KARL	□TE2-2351
	D ZABKIWICZ	TE2-2445
	*HEATHER HL APT MGR	TE1-8132
	LEONA WESTERLUND	TE3-3586
	JOSEPH BASCH JR	TE3-3732
	FRANK A CIHANITIS	TE3-6035
	IDA C WALLACE	TE3-1951
	HAZEL G FULLER	TE3-2743
	THOMAS A BOOTH	□TE1-2920
	BENRY STAATS	TE1-4624
	*HEATHER HALL GROCY	TE1-4879
	LILLIAN GRADY	□TE1-5096
	DIANE NICHOLAS	TE1-1684
3450	*HEATHER HALL BAR	TE1-7929
3457	W L JONES	TE2-1382
	JULIETTE JONES	TE2-1382
3458	CHARLES DAHLMAN	TE1-9286
3470	*ZSIDO BROS SERVICE	TE1-3073
3500	*TOMBOY MARKETS	TE3-8210
3515	*EARLS STNDRD SERV	TE3-9594
3516	JAMES D WILKINSON	□TE3-6423
3525	*CASS PARK LNDRY	TE2-0381
	*WOLFE DET PROD	□TE2-0381
3527	BELLA A GRIFFITH	TE3-2518
3533	LEONA WIENER	□TE1-5481
3534	*IDEAL LAUNDRY	□FA1-0782
3544	*REXMERE HOTEL	TE2-8999
3545	ALICE HANKINS	TE1-2188
	LAWR PHILLIPS	FA1-0683
3550	*ABE WARSHAWSKY	TE1-8400
	*ABE THE TLR	TE1-8400
3552	TONY MCNDAY	TE2-3860
	CARL J SHARP	□TE1-4362
3554	*PARIS BEAUTY SER	□TE3-5340
3559	*HOTEL RIO	TE1-7175
	*RIO HOTEL	TE1-7175
	DOLORES DOWNER	□TE1-9556
3562	*LAUNDROMAT LAUNDRY	TE3-5265
3564	*METROPOLITAN RESTR	TE2-9200
3568	*DUCAT BAR	TE3-9418
3574	*SECONO BRAINARO SV	TE2-9782
3577	CHARLES B MCCOY	TE1-9354
	ELIE J PHANEUF	TE2-1483
	CHARLES C BROOKS	TE1-5405
	HOWARO NEELY	TE1-6891
	WALTER JACKSON	□TE1-3236
	GERTRUDE L ROSS	□TE1-3611
3710	CLARA CHARETTE	TE1-6369
3711	BERNICE KRONK	TE1-1317
3713	*SECOND&BRAINARD MK	TE2-8778
3714	FRED JONES	FA1-0844
	FRED JONES	□FA1-0844
3716	WM SIMPSON	TE2-6522
3721	*SACHS CLNRS&LNDRY	TE2-8871
3727	*J&H FURN&VARIETY	TE2-5007
3729	GRADY A KING	□TE3-3560
3745	STEPHEN YEE	TE1-6243
3751	AUDRA GWALTNEY	□TE1-0146
3752	CHARLES W HIBBERTS	TE1-5130
3753	H L EASTWORTH	TE1-0845
	JOHN L WEISER	TE1-1341
	ROY NICHOLAS	TE2-3115
	RONALD W CLANCY	TE1-2465
3760	LOUIS W BAKER	TE2-0256
	MARC BRUN	TE2-2467
3761	MICHAEL REDMOND	TE2-6608
	DELSIA FOSTER	TE3-5955
3762	*DET WINDOW CLN CO	TE1-2834
3763	RAY SULLIVAN	TE1-9351
	EDGAR MUSCAT	TE3-4899
3768	*OLIVIA HOTEL	TE2-8534
3771	PETE V ARNAUOOFF	□TE2-6657
3773	OLGA RODRIGUEZ	TE1-1105
	B F THACKER	□TE3-9139
	*DR I H FRIEDMAN	TE1-4444
3776	*ELMERS SECONTD&SEL	□TE2-8322
3900	*SELDEN DRUG CO	TE1-2080
3905	GEO TARTLER	TE3-3041
	HOBART L SANDERS	TE2-4352
	GLENN IDE	TE2-6362
	ALBERT T DOOLEY	TE1-4751
	LAURA WOODWARD	TE3-4174
	K C WOODWARD	TE3-4174
	IRENE MILLER	□TE3-1096
	*WARWICK APARTMENT	TE3-2174
	JOHNIE A HILL	□TE2-6551
	JUANITA HILL	□TE2-6551
	FRED KEYES	□TE1-3878
3912	*SELDEN COCKTAIL BR	TE2-8372
3914	*CHRISTS CAFE	TE2-9769
3915	*GENEVA BEAUTY SLN	TE1-9658
3917	*JEFFRIES FLOWERS	TE2-3447
3921	*CRACKER BOX CAFE	□TE2-8373
3929	*HARRISON LDRY&CLNR	TE1-7810
	*HARRISON LDRY&CLNR	TE2-9770
3938	WILLIAM A BERRY	TE2-5533
	*DESIGN SERV CO	TE2-5533
3945	*DOROTHY HOTFL	TE1-5112
3951	WILLIAM H BERNARD	TE2-6861
	HERMAN TUCKER	TE1-5057
3961	*RENEE VOCAL STUDIO	TE1-0799

Target Street	Cross Street	Source
✓	-	Polk's City Directory

2ND AVE 1940

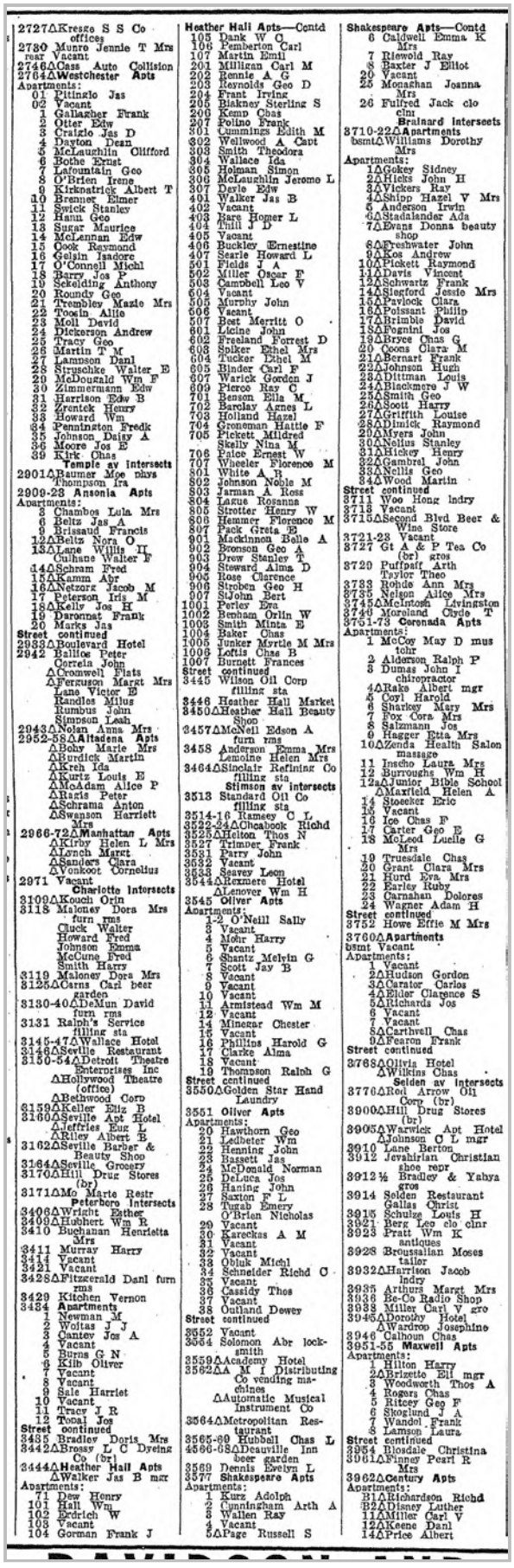


Seville Apt Hotel—Contd
817 Kalis E
818 Carson M
819 Bell Ralph E
820 Roth M
821 Vacant
Street continued
3162 Seville Barber Shop
Seville Beauty Shop
3164△Seville Grocery
3165 Vacant
3167△King's Grill
3170△Hill Drug Stores (br)
3171△Ralph's Bar beer garden
3189 John Norman
Peterboro Intersects
3406 Baldwin Eug
△Marshall John
3400△Hubbert Helen O Mrs ®
Gould Howard F
3410 Buchanan Henrietta J Mrs
Reardon Julia drsmkr
3414 McKinney Chas
3421 Carrigan Robt M
3428△Fitzgerald Danl M furn rms
3429 Verow Wm J
3434 **Apartments**
1△Johnson Vigno T
2△Knight Robt O
3 McCormick Herbert
4 Buckley Thos M
5 Huey Allan
6 Kith Oliver S
7 Willoughby John L
8 Dill Ray J
9 Miller Tred A
10 Farrel Chas
11 Vacant
12 Meneghian Louis
Street continued
3435 Gontz Harry C
3442 Heather Hall Cleaners
3444△**Heather Hall Apt Hotel**
Apartments:
71 Vacant
101 Vacant
102 Bose Clarence F
103 Sawyer Robt E
104 Belanger Chester
105 Basey Wm
106 Vacant
107 Vacant
201 Beaudin Leo P
Campbell Harold M
202 Feller Herman
203 Stacy Violet
204 Vacant
205 Foster Carl B
206 Green Harold
207 Calcaterra Arth
301 Vacant
302 Vacant
303 Vacant
304 Vacant
305 Dameron Paul
306 Vacant
307 Wendell Monte M
401 Vacant
402 Vacant
403 Vacant
404 Luce Cecil A
405 Robinson Florence
406 Milliken Florence
407 Doyle Edw
501 Lorenz Clifford A
502 Vacant
503 Lewis Irma Mrs
504 Ehrenfeld Peter E
505 Bender Carl
506 Vacant
507 Skelly Nina
Pickett Mildred
601 Warriner Saml H
602 Kimbel Otto P
603 Rawdon Jas A
604 Tucker Ethel M
605 Zika Mabel
607 Vacant
609 Duke Mildred
701 Vacant
702 Barclay Agnes M
703 Smith Minta
704 Collar Beggie H
705 Buckley Ernestine
706 Dibari Guiseppi
707 Vacant
801 Sirels Gilbert
802 Wagner Fred
803 Price Boyd
804 Vacant
805 Vacant
806 Wright Kath Mrs
807 Pack Greta E
901 Burnett Frances
902 Perley Eva
903 Vacant
904 Steward Alma D
905 Fuller Hazel G
906 Brown C H
907 Straw Edw
1001 Guttentag Harry
1002 Benham Orlin W
1003 Glover Steven B
1004 Vacant
1005 Pelavin Harry
1006 DuGuay C
1007 Vacant
Street continued
3445 Vacant
3446 Vacant
3450△Heather Hall Barber Shop
Heather Hall Beauty Shop
3457△McNeil Edson A real est
3458 Anderson Edith Mrs
3464△Belanger & Foucault serv sta
Stimson av Intersects
3514-16△Hendershot Lowell F
3515 Bossence Wm S fill sta
3522-24△Chocbcok Richd furn rms
3525 Newman Mary A Mrs drsmkr
3527△Gregory Katheryn Mrs
3531 Shockley Harold J
3532-34△Kleber Harry G furn rms
3533 Seavey Leon
3544 Stanton Raymond H
3545-51 **Mayfair Apts** bsmt Walker Jas
Apartments:
1 Kaiser Edna Mrs
2 Schiffer Jos
3 Collins Ruby Mrs
4 Johnson Emma
5 Earley Hillary
6 Hyatt Jack

SEOOND BLVD—Contd
Mayfair Apts—Contd
7 Janes Emaline Mrs
8 Vacant
9 Oliver Pauline Mrs
10 Callas John
11 Spohn Leo
12 Davis Jas
14 Davis Ray
15 Sackville Harvey
16 VanBuskirk Chas
17 Oliver Ray mgr
18 Curren Richd
19 Powell Amelia Mrs
20 LaPointe Stella Mrs
21 Vacant
22 Reed Geo
23 Miller Geo
24 Mason Geo W
25 Hutchinson Bernice Mrs
26 Ray Rush
27 Liet Marian
28 Carl Fredk
29 Vella Jos
30 Farmer David F
31 Vacant
32 Gray Chas E
33 Collier Emmett
34 Peyton Harold
35 Popiwchak John
36 Vacant
37 Edwards Lawrence
38 Vacant
39 Maine Julian
40 Kiel John
41 Vacant
Street continued
3550 Golden Star Hand Laundry
3554△Claire Beauty Salon
3559△Academy Hotel
3562 Vacant
3564△Metropolitan Restr
3565-69△Corrmmire Henry C
3566-68△Deauville Inn beer garden
3574△Grahlman Service
3577 **Shakespeare Apts**
Apartments:
1 Vacant
2 Schlosser Fritz
3 Vacant
4 Lawrence Jean A
5△Page Russell S mgr
6 Caldwell Alf B
7 Boukas Nicholas W
8 Grimsby Hugh M
25 Slayden John H
26 Cross Alf S
Brainard Intersects
3710-20 **Apartments**
(For other tenants see 504 Brainard)
4 Capps John E
5 Macleod LaFern Mrs
6 Oliphant Chas L
7△Shipp Louis mgr
8 MacLeod Ronald L
18 Wiacek L
19 Osborne Roy L
20 Coons Clara M Mrs
21 Nisseda Peter P
22 Ernst Geo W
23 Dittman Lewis C
29 Moisan Thos F
30 Goodin Marshall W
31 Huband Victor H
32 Davis Norman J
33 Nellis Geo B
34 Reini Eino
Street continued
3711-13△Second-Brainard Mkt meats and grcs
3721-23△Sanders Tri-Cleaning Co (br)
3727 Vacant
3729 Vancore Harry W
Ragland John F
3733 Moore Robt
3735 Nelson Alice M
3736 Adamic Anthony
3746 Sears Genevieve M Mrs
3751-73△**Coronado Apts**
Apartments:
1△Jones Edw B mgr
2△Simpson Frank
3 Nolan Anna Mrs
4 Vacant
5 Truesdale Chas
6 Sharkey Mary Mrs
7 Leeds Wm
8 Vacant
9 Harriman Clayt
10 McClurkin Saml G
11 Vacant
12 Martin Aleta Mrs
12a Vacant
14 Hagger Etta Mrs
15 Vacant
16 Vacant
17 Peel Alice F Mrs
18△Win-Beauty Salon
Winn Irene Mrs
19△Cronk Peter
20 Mellen Saml
21 Heifer Harry H
22 Earley Ruby
23 Vacant
24△Wagner Adam H
B25 Hollon Jane Mrs
B37 DeLorme Jos G
Street continued
3752 Beaver Philip
3760△Agee Garnet A furn rms
3762△Detroit Window Clng Co
3768△Olivia Hotel
3776 Barney Serv Sta
Selden av Intersects
3900△Hill Drug Stores (br)
3905△**Warwick Apt Hotel**
3910 Soderstrum Helmar
3912 Jevahirian Christian J shoe repr
3912½ Kallas Christ beer garden
3914△Erin Grill
3915 Thompson Geo E
3921 Cunningham Chester D restr
3928△Hollywood Dairy Bar ice cream
3928 Broussallan Moses clo elnr
3932-36△Harrison Jacob indry
3935 Arthurs Margt Mrs
3938 Kalep Victoria grc
3945△Hotel Dorothy Wardrop Josephine Mrs
3946 Vacant
3951-55 **Maxwell Apts**
Apartments:
1 Siegel Leah Mrs

Target Street	Cross Street	Source
✓	-	Polk's City Directory

2ND AVE 1935



2727ΔKresge S S Co offices
2730 Munro Jennie T Mrs rear Vacant
2746ΔCass Auto Collision
2764ΔWestchester Apts
Apartments:
01 Pitinglo Jas
02 Vacant
1 Gallagher Frank
2 Otter Edw
3 Craizio Jas D
4 Dayton Dean
5 McLaughlin Clifford
6 Bothe Ernst
7 Lafountain Geo
8 O'Brien Irene
9 Kirkpatrick Albert T
10 Brenner Elmer
11 Swick Stanley
12 Hanu Geo
13 Sugar Maurice
14 McLennan Edw
15 Cook Raymond
16 Gelsin Isadore
17 O'Connell Michl
18 Barry Jos P
19 Sekelding Anthony
20 Roundy Geo
21 Trembley Mazie Mrs
22 Tookin Allie
23 Moll David
24 Dickerson Andrew
25 Tracy Geo
26 Martin T M
27 Lampson Danl
28 Struschke Walter E
29 McDonald Wm F
30 Zimmermann Edw
31 Harrison Edw B
32 Zrentek Henry
33 Howard Wm
34 Pennington Fredk
35 Johnson Daisy A
36 Moore Jos E
39 Kirk Chas
Temple av intersects
2901ΔBaumer Moe phys
Thompson Ira
2909-23 Ansonia Apts
Apartments:
3 Chambos Lula Mrs
6 Beltz Jas A
9 Brisaud Francis
12ΔBeltz Nora O
13ΔLane Willis H
Guihuse Walter F
14ΔSchram Fred
15ΔKamm Abr
16ΔNetzorx Jacob M
17 Peterson Iris M
18ΔKelly Jos H
19 Daromat Frank
20 Marks Jas
Street continued
2933ΔBoulevard Hotel
2942 Halliog Peter
Correia John
ΔCromwell Flats
ΔFerguson Margt Mrs
Lane Victor E
Landles Miles
Rumbus John
Simpson Leah
2943ΔNolan Anna Mrs
2952-58ΔAltadena Apts
ΔBohy Marie Mrs
ΔBurdick Martin
ΔKreh Ida
ΔKurtz Louis E
ΔMcAdam Alice P
ΔRazis Peter
ΔSchrama Anton
ΔSwanson Harriett Mrs
2966-72ΔManhattan Apts
ΔKirby Helen L Mrs
ΔLynch Margt
ΔSanders Clara
ΔVonkoost Cornelius
2971 Vacant
Charlotte intersects
3109ΔKouch Orin
3118 Maloney Dora Mrs furn rms
Cluck Walter
Howard Fred
Johnson Emma
McCune Fred
Smith Harry
3119 Maloney Dora Mrs
3125ΔCarns Carl beer garden
3130-40ΔDeMun David furn rms
3131 Ralph's Service filling sta
3145-47ΔWallace Hotel
3146ΔSeville Restaurant
3150-54ΔDetroit Theatre Enterprises Inc
ΔHollywood Theatre (offices)
ΔBethwood Corp
3159ΔKeller Eliz B
3160ΔSeville Apt Hotel
ΔJeffries Eug L
ΔRiley Albert B
3162ΔSeville Barber & Beauty Shop
3164ΔSeville Grocery
3170ΔHill Drug Stores (br)
3171ΔMo Marte Restr
Peterboro Intersects
3406ΔWright Esther
3409ΔHubbert Wm R
3410 Buchanan Henrietta Mrs
3411 Murray Harry
3414 Vacant
3421 Vacant
3428ΔFitzgerald Danl furn rms
3429 Kitchen Vernon
3434 Apartments
1 Newman M
2 Wojtas J J
3 Cantey Jos A
4 Vacant
5 Burns G N
6 Kilb Oliver
7 Vacant
8 Vacant
9 Sale Harriet
10 Vacant
11 Tracy J R
12 Topal Jos
Street continued
3465 Bradley Doris Mrs
3442ΔBrossy L C Dyeing Co (br)
3444ΔHeather Hall Apts
ΔWeker Jas B mgr
Apartments:
71 Dew Henry
101 Hall Wm
102 Erdrich W
103 Vacant
104 Gorman Frank J
Heather Hall Apts—Contd
105 Dank W C
106 Pemberton Carl
107 Martin Emil
201 Milligan Carl M
202 Rennie A G
203 Reynolds Geo D
204 Frant Irving
205 Blakney Sterling S
206 Kemp Chas
207 Polino Frank
301 Cummings Edith M
302 Wellwood A Capt
303 Smith Theodora
304 Wallace Ida
305 Holman Simon
306 McLaughlin Jerome L
307 Doyle Edw
401 Walker Jas B
402 Vacant
403 Bare Homer L
404 Thill J D
405 Vacant
406 Buckley Ernestine
407 Searle Howard L
501 Fields J A
502 Miller Oscar F
503 Campbell Leo V
504 Vacant
505 Murphy John
506 Vacant
507 Best Merritt O
601 Licine John
602 Freeland Forrest D
603 Spiker Ethel Mrs
604 Tucker Ethel M
605 Binder Carl F
607 Warick Gordon J
609 Pierce Ray C
701 Benson Ella M
702 Barclay Agnes L
703 Holland Hazel
704 Groneman Hattie F
705 Pickett Mildred
Skelly Nina M
706 Paice Ernest W
707 Wheeler Florence M
801 White A D
802 Johnson Noble M
803 Jarman A Ross
804 Lague Rosanna
805 Strotter Henry W
806 Hammer Florence M
807 Pack Greta B
901 Mackinnon Belle A
902 Bronson Geo A
903 Drew Stanley T
904 Steward Alma D
905 Rose Clarence
906 Stroben Geo H
907 StJohn Bert
1001 Perley Ern
1002 Benham Orlin W
1003 Smith Minta E
1004 Baker Chas
1005 Junker Myrtle M Mrs
1006 Loftis Chas B
1007 Burnett Frances
Street continued
3445 Wilson Oil Corp filling sta
3446 Heather Hall Market
3450ΔHeather Hall Beauty Shop
3457ΔMcNeil Edson A furn rms
3458 Anderson Emma Mrs
Lemoine Helen Mrs
3464ΔSinclair Refining Co filling sta
Stimson av intersects
3513 Standard Oil Co filling sta
3514-16 Ramsey C L
3522-24ΔChoabock Richd
3525ΔHelton Thos N
3527 Trimper Frank
3531 Parry John
3532 Vacant
3533 Seavey Leon
3544ΔRexmere Hotel
ΔLenover Wm H
3545 Oliver Apts
Apartments:
1-2 O'Neill Sally
3 Vacant
4 Mohr Harry
5 Vacant
6 Shantz Melvin G
7 Scott Jay B
8 Vacant
9 Vacant
10 Vacant
11 Armistead Wm M
12 Vacant
14 Minegar Chester
15 Vacant
16 Phillips Harold G
17 Clarke Alma
18 Vacant
19 Thompson Ralph G
Street continued
3550ΔGolden Star Hand Laundry
3551 Oliver Apts
Apartments:
20 Hawthorn Geo
21 Ledbeter Wm
22 Henning John
23 Bassett Jas
24 McDonald Norman
25 DeLuca Jos
26 Haning John
27 Saxton F L
28 Tugab Emery
O'Brien Nicholas
29 Vacant
30 Karockas A M
31 Vacant
32 Vacant
33 Obluk Michl
34 Schneider Richd C
35 Vacant
36 Cassidy Thos
37 Vacant
38 Outland Dewey
Street continued
3552 Vacant
3564 Solomon Abr locksmith
3559ΔAcademy Hotel
3562ΔΔ M I Distributing Co vending machines
ΔAutomatic Musical Instrument Co
3564ΔMetropolitan Restaurant
3565-69 Hubbell Chas L
4566-68ΔDeauville Inn beer garden
3569 Dennis Evelyn L
3577 Shakespeare Apts
Apartments:
1 Kurz Adolph
2 Cunningham Arth A
3 Wallen Ray
4 Vacant
5ΔPage Russell S
Shakespeare Apts—Contd
6 Caldwell Emma K Mrs
7 Riewold Ray
8 Baxter J Elliot
20 Vacant
25 Monachan Joanna Mrs
26 Fulfred Jack clo clnr
Brainard intersects
3710-22ΔApartments
bsmtΔWilliams Dorothy Mrs
Apartments:
1ΔGoker Sidney
2ΔHicks John H
3ΔVickers Ray
4ΔShipp Hazel V Mrs
5 Anderson Irvin
6ΔStadalander Ada
7ΔEvans Donna beauty shop
8ΔFreshwater John
9ΔKos Andrew
10ΔPickett Raymond
11ΔDavis Vincent
12ΔSchwartz Frank
14ΔSiegford Jessie Mrs
15ΔPavlock Clara
16ΔPoissant Philip
17ΔBrimble David
18ΔPognini Jos
19ΔBryce Chas G
20 Coons Clara M
21ΔBernart Frank
22ΔJohnson Hugh
23ΔDittman Louis
24ΔBlackmore J W
25ΔSmith Geo
26ΔScott Harry
27ΔGriffith Louise
28ΔDinick Raymond
29ΔMyers John
30ΔNelius Stanley
31ΔHickey Henry
32ΔGambrel John
33ΔNellis Geo
34ΔWood Martin
Street continued
3711 Woo Hong Indry
3713 Vacant
3715ΔSecond Blvd Beer & Wine Store
3721-23 Vacant
3727 Gt A & P Tea Co (br) gros
3729 Puffpaff Arth
Taylor Theo
3733 Rohde Ann Mrs
3735 Nelson Alice Mrs
3745ΔMcIntosh Livingston
3749 Moreland Clyde T
3751-73 Coronada Apts
Apartments:
1 McCoy May D mus tchr
2 Alderson Ralph P
3 Dumas John I chiropractor
4ΔRake Albert mgr
5 Coyl Harold
6 Sharkey Mary Mrs
7 Fox Cora Mrs
8 Salzmann Jos
9 Hagger Etta Mrs
10ΔZenda Health Salon massage
11 Inscho Laura Mrs
12 Burroughs Wm H
12aΔJunior Bible School
ΔMaxfield Helen A
14 Stoecker Eric
15 Vacant
16 Ice Chas F
17 Carter Geo E
18 McLeod Lucile G Mrs
19 Truesdale Chas
20 Grant Clara Mrs
21 Hurd Eva Mrs
22 Earley Ruby
23 Carnahan Dolores
24 Wagner Adam H
Street continued
3752 Howe Effie M Mrs
3760ΔApartments
bsmt Vacant
Apartments:
1 Vacant
2ΔHudson Gordon
3ΔCarator Carlos
4ΔElder Clarence S
5ΔRichards Jos
6 Vacant
7 Vacant
8ΔCarthvell Chas
9ΔPearon Frank
Street continued
3768ΔOlivia Hotel
ΔWilkins Chas
Selden av intersects
3770ΔRed Arrow Oil Corp (br)
3900ΔHill Drug Stores (br)
3905ΔWarwick Apt Hotel
ΔJohnson C L mgr
3910 Lane Berton
3912 Jevahirian Christian shoe repr
3912½ Bradley & Yahya gros
3914 Selden Restaurant
Gallas Christ
3915 Schulze Louis H
3921 Berg Leo clo clnr
3923 Pratt Wm K antiques
3928 Broussalian Moses tailor
3932ΔHarrison Jacob Indry
3935 Arthurs Margt Mrs
3938 Be-Co Radio Shop
3938 Miller Carl V gro
3945ΔDorothy Hotel
ΔWardrop Josephine
3946 Calhoun Chas
3951-55 Maxwell Apts
Apartments:
1 Hilton Harry
2ΔBrizette Eli mgr
3 Woodworth Thos A
4 Rogers Chas
5 Ritcey Geo F
6 Skoglund J A
7 Wandol Frank
8 Lamson Laura
Street continued
3954 Blosdale Christina
3961ΔFinney Pearl R Mrs
3962ΔCentury Apts
Apartments:
B1ΔRichardson Richd
B2ΔDisney Luther
11ΔMiller Carl V
12ΔKeene Danl
14ΔPrice Albert

Target Street	Cross Street	Source
✓	-	Polk's City Directory

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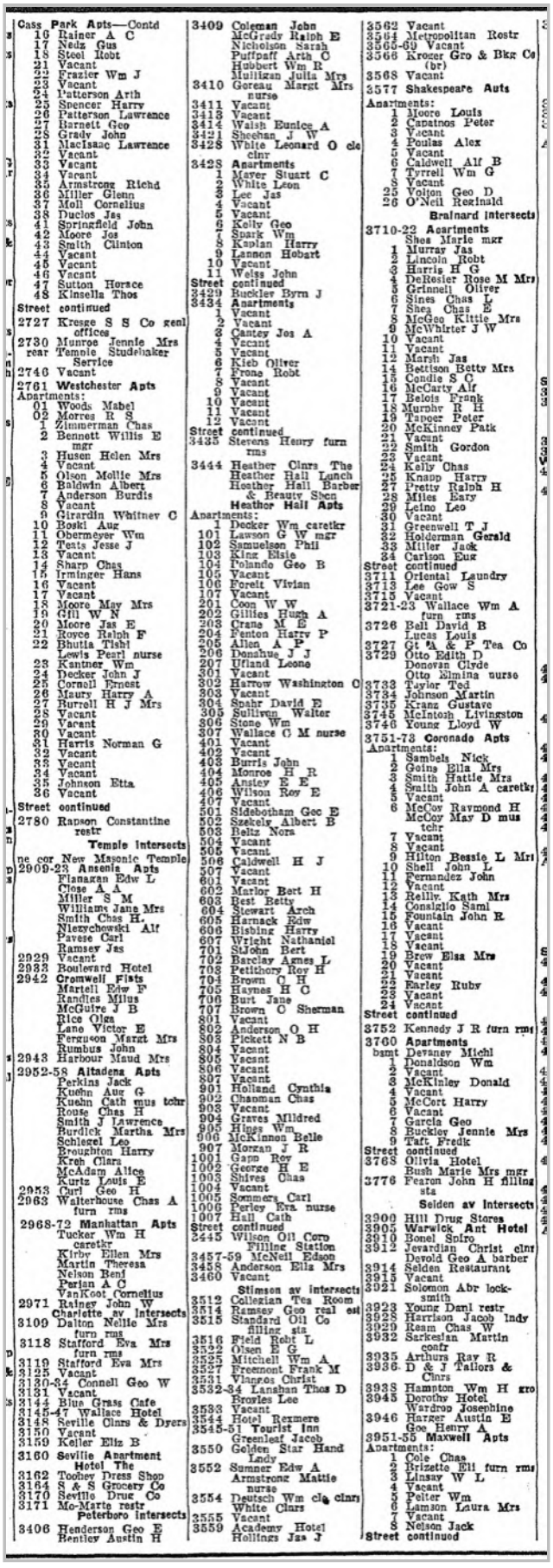

Cass Park Apts—Contd
16 Rainer A C
17 Nedz Gus
18 Steel Robt
21 Vacant
22 Frazier Wm J
23 Vacant
24 Patterson Arth
25 Spencer Harry
26 Patterson Lawrence
27 Barnett Geo
28 Grady John
31 MacIsaac Lawrence
32 Vacant
33 Vacant
34 Vacant
35 Armstrong Richd
36 Miller Glenn
37 Moll Cornelius
38 Duclos Jas
41 Springfield John
42 Moore Jos
43 Smith Clinton
44 Vacant
45 Vacant
46 Vacant
47 Sutton Horace
48 Kinsella Thos

Street continued
2727 Kresge S S Co genl offices
2730 Munroe Jennie Mrs rear Temple Studebaker Service
2746 Vacant
2761 Westchester Apts
Apartments:
01 Woods Mabel
02 Morres R S
1 Zimmerman Chas
2 Bennett Willis E mgr
3 Husen Helen Mrs
4 Vacant
5 Olson Mollie Mrs
6 Baldwin Albert
7 Anderson Burdis
8 Vacant
9 Girardin Whitney C
10 Boski Aug
11 Obermeyer Wm
12 Teats Jesse J
13 Vacant
14 Sharp Chas
15 Irminger Hans
16 Vacant
17 Vacant
18 Moore May Mrs
19 Gill W N
20 Moore Jas E
21 Royce Ralph F
22 Bhutia Tishi
Lewis Pearl nurse
23 Kantner Wm
24 Decker John J
25 Cornell Ernest
26 Maury Harry A
27 Burrell H J Mrs
28 Vacant
29 Vacant
30 Vacant
31 Harris Norman G
32 Vacant
33 Vacant
34 Vacant
35 Johnson Etta
36 Vacant

Street continued
2780 Rapson Constantine restr
Temple intersects
ne cor New Masonic Temple
2909-23 Ansonia Apts
Flanagan Edw L
Close A A
Miller S M
Williams Jane Mrs
Smith Chas H.
Nieszychowski Alf
Pavese Carl
Ramsey Jas
2929 Vacant
2933 Boulevard Hotel
2942 Cromwell Flats
Martell Edw F
Randles Milus
McGuire J B
Rice Olga
Lane Victor E
Ferguson Margt Mrs
Rumbus John
2943 Harbour Maud Mrs
2952-58 Altadena Apts
Perkins Jack
Kuehn Aug G
Kuehn Cath mus tchr
Route Chas H
Smith J Lawrence
Burdick Martha Mrs
Schlegel Leo
Broughton Harry
Kreh Clara
McAdam Alice
Kurtz Louis E
2953 Curl Geo H
2963 Walterhouse Chas A furn rms
2968-72 Manhattan Apts
Tucker Wm H caretkr
Kirby Ellen Mrs
Martin Theresa
Nelson Benj
Perian A C
VanKoot Cornelius
2971 Rainey John W
Charlotte av intersects
3109 Dalton Nellie Mrs furn rms
3118 Stafford Eva Mrs furn rms
3119 Stafford Eva Mrs
3125 Vacant
3130-34 Connell Geo W
3131 Vacant
3144 Blue Grass Cafe
3145-47 Wallace Hotel
3148 Seville Clnrs & Dyers
3150 Vacant
3159 Keller Eliz B
3160 Seville Apartment Hotel The
3162 Toober Dress Shop
3164 S & S Grocery Co
3170 Seville Drug Co
3171 Mo-Marte restr
Peterboro intersects
3406 Henderson Geo E
Bentley Austin H
3409 Coleman John
McGrady Ralph E
Nicholson Sarah
Puffpaff Arth C
Hubbert Wm R
Mullikan Julia Mrs
3410 Gereau Margt Mrs nurse
3411 Vacant
3413 Vacant
3414 Walsh Eunice A
3421 Sheehan J W
3428 White Leonard O cle clnr
3428 Apartments
1 Mayer Stuart C
2 White Leon
3 Lee Jas
4 Vacant
5 Vacant
6 Kelly Geo
7 Spark Wm
8 Kaplan Harry
9 Lannon Hobart
10 Vacant
11 Weiss John
Street continued
3429 Buckler Byrn J
3434 Apartments
1 Vacant
2 Vacant
3 Cantey Jos A
4 Vacant
5 Vacant
6 Kleb Oliver
7 Frone Robt
8 Vacant
9 Vacant
10 Vacant
11 Vacant
12 Vacant
Street continued
3435 Stevens Henry furn rms
3444 Heather Clnrs The
Heather Hall Lunch
Heather Hall Barber & Beauty Shop
Heather Hall Apts
Apartments:
1 Decker Wm caretkr
101 Lawson G W mgr
102 Samuelson Phil
103 King Elsie
104 Polando Geo B
105 Vacant
106 Foreit Vivian
107 Vacant
201 Coon W W
202 Gillies Hugh A
203 Crane M E
204 Fenton Harry P
205 Allen A P
206 Donahue J J
207 Upland Leone
301 Vacant
302 Harrow Washington C
303 Vacant
304 Spahr David E
305 Sullivan Walter
306 Stone Wm
307 Wallace C M nurse
401 Vacant
402 Vacant
403 Burris John
404 Monroe H R
405 Anstey E E
406 Wilson Roy E
407 Vacant
501 Sidebotham Geo E
502 Szekely Albert B
503 Beltz Nora
504 Vacant
505 Vacant
506 Caldwell H J
507 Vacant
601 Vacant
602 Marlor Bert H
603 Best Betty
604 Stewart Arch
605 Harnack Edw
606 Bisbing Harry
607 Wright Nathaniel
701 StJohn Bert
702 Barclay Agnes L
703 Pettibone Roy H
704 Brown O H
705 Haynes H C
706 Burt Jane
707 Brown C Sherman
801 Vacant
802 Anderson O H
803 Pickett N B
804 Vacant
805 Vacant
806 Vacant
807 Vacant
901 Holland Cynthia
902 Chapman Chas
903 Vacant
904 Graves Mildred
905 Higgs Wm
906 McKinnon Belle
907 Morgan J R
1001 Gapp Roy
1002 George H E
1003 Shives Chas
1004 Vacant
1005 Sommers Carl
1006 Perley Eva nurse
1007 Hall Cath
Street continued
3445 Wilson Oil Corp Filling Station
3457-59 McNeil Edson
3458 Anderson Ella Mrs
3460 Vacant
Stimson av intersects
3512 Collegian Tea Room
3514 Ramsey Geo real est
3515 Standard Oil Co filling sta
3516 Field Robt L
3522 Olsen E G
3525 Mitchell Wm A
3527 Freemont Frank M
3531 Vlangos Christ
3532-34 Lanahan Thos D
Broyles Lee
3533 Vacant
3544 Hotel Rexmere
3545-51 Tourist Inn
Greenleaf Jacob
3550 Golden Star Hand Laundry
3552 Sumner Edw A
Armstrong Mattie nurse
3554 Deutsch Wm cle clnr
White Clnrs
3555 Vacant
3559 Academy Hotel
Hollings Jas J
3562 Vacant
3564 Metropolitan Restr
3565-69 Vacant
3566 Krozer Gro & Bkr Co (br)
3568 Vacant
3577 Shakespeare Auts
Apartments:
1 Moore Louis
2 Capatnos Peter
3 Vacant
4 Poulas Alex
5 Vacant
6 Caldwell Alf B
7 Tyrrell Wm G
8 Vacant
25 Volpa Geo D
26 O'Neil Reginald
Brainard intersects
3710-22 Apartments
Shea Marie mgr
1 Murray Jas
2 Lincoln Robt
3 Harris H G
4 DeRosier Rose M Mrs
5 Grinnell Oliver
6 Sines Chas L
7 Shea Chas E
8 McGee Kittie Mrs
9 McWhirter J W
10 Vacant
11 Vacant
12 Marsh Jas
14 Bettison Betty Mrs
15 Condie S C
16 McCarty Alf
17 Belois Frank
18 Murphy R H
19 Tapeer Peter
20 McKinney Patk
21 Vacant
22 Smith Gordon
23 Vacant
24 Kelly Chas
25 Knapp Harry
27 Pretty Ralph H
28 Miles Mary
29 Leino Leo
30 Vacant
31 Greenwell T J
32 Holderman Gerald
33 Miller Jack
34 Carlson Eug
Street continued
3711 Oriental Laundry
3713 Lee Gow S
3715 Vacant
3721-23 Wallace Wm A furn rms
3726 Bell David B
Lucas Louis
3727 Gt A & P Tea Co
3729 Otto Edith D
Donovan Clyde
Otto Elmina nurse
3733 Taylor Ted
3734 Johnson Martin
3735 Kranz Gustave
3745 McIntosh Livingston
3746 Young Lloyd W
3751-73 Coronado Apts
Apartments:
1 Sambels Nick
2 Goins Ella Mrs
3 Smith Hattie Mrs
4 Smith John A caretkr
5 Vacant
6 McCoy Raymond H
McCoy May D mus tchr
7 Vacant
8 Vacant
9 Hilton Bessie L Mrs
10 Shell John L
11 Fernandez John
12 Vacant
13 Reilly Kath Mrs
14 Consiglio Saml
15 Fountain John R
16 Vacant
17 Vacant
18 Vacant
19 Brew Elsa Mrs
20 Vacant
21 Vacant
22 Farley Ruby
23 Vacant
24 Vacant
Street continued
3752 Kennedy J R furn rms
3760 Apartments
bsmt Devaney Michl
1 Donaldson Wm
2 Vacant
3 McKinley Donald
4 Vacant
5 McCort Harry
6 Vacant
7 Garcia Geo
8 Buckley Jennie Mrs
9 Taft Fredk
Street continued
3768 Olivia Hotel
Bush Marie Mrs mgr
3776 Pearon John H filling sta
Selden av intersects
3900 Hill Drug Stores
3905 Warwick Ant Hotel
3910 Bonel Spiro
3912 Jevardian Christ clnr
Devold Geo A barber
3914 Selden Restaurant
3915 Vacant
3921 Solomon Abr locksmith
3923 Young Danl restr
3928 Harrison Jacob Indy
3929 Ream Chas W
3932 Sarkesian Martin confr
3935 Arthurs Ray R
3936 D & J Tailors & Clnrs
3938 Hampton Wm H rro
3945 Dorothy Hotel
Wardrop Josephine
3946 Harger Austin E
Gee Henry A
3951-55 Maxwell Apts
Apartments:
1 Cole Chas
2 Brizette Eli furn rms
3 Linsay W L
4 Vacant
5 Pelter Wm
6 Lamson Laura Mrs
7 Vacant
8 Nelson Jack
Street continued

Target Street	Cross Street	Source
✓	-	Polk's City Directory

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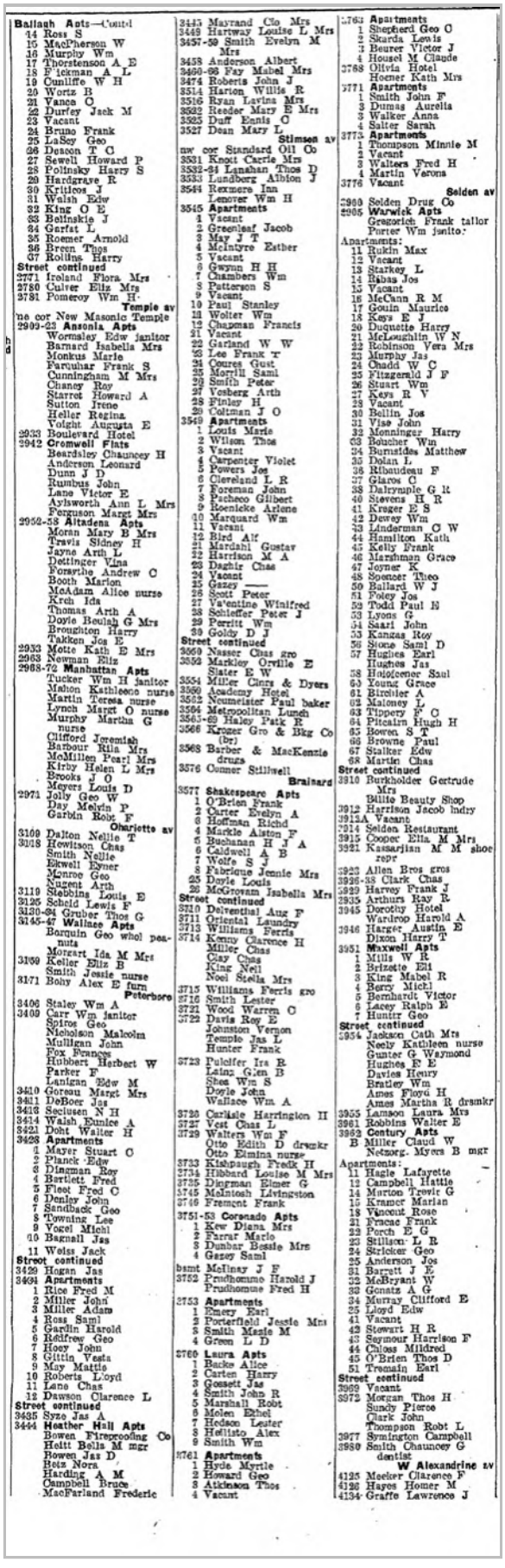


Ballaugh Apts—Contd
14 Ross S
15 MacPherson W
16 Murphy Wm
17 Thorstenson A E
18 Fickman A L
19 Cunliffe W H
20 Wortz B
21 Vance O
22 Durfey Jack M
23 Vacant
24 Bruno Frank
25 LaSey Geo
26 Deacon T C
27 Sewell Howard P
28 Polinsky Harry S
29 Hardgrave R
30 Kritikos J
31 Walsh Edw
32 King O E
33 Bolinskie J
34 Garfat L
35 Roemer Arnold
36 Breen Thos
37 Rollins Harry
Street continued
3771 Ireland Flora Mrs
3780 Culver Eliz Mrs
3781 Pomeroy Wm H
Temple av
ne cor New Masonic Temple
2909-23 Ansonia Apts
Wormsley Edw janitor
Barnard Isabella Mrs
Monkus Marie
Farquhar Frank S
Cunningham M Mrs
Chaney Roy
Starret Howard A
Sutton Irene
Heller Regina
Voight Augusta E
2933 Boulevard Hotel
2942 Cromwell Flats
Beardsley Chauncey H
Anderson Leonard
Dunn J D
Rumbus John
Lane Victor E
Aylsworth Ann L Mrs
Ferguson Marg Mrs
2952-58 Altadena Apts
Moran Mary B Mrs
Travis Sidney H
Jayne Arth L
Dettinger Vina
Forsythe Andrew C
Booth Marion
McAdam Alice nurse
Krch Ida
Thomas Arth A
Doyle Beulah G Mrs
Broughton Harry
Talken Jos E
2933 Motte Kath E Mrs
2963 Newman Eliz
2968-72 Manhattan Apts
Tucker Wm H janitor
Mahon Kathleene nurse
Martin Teresa nurse
Lynch Marg O nurse
Murphy Martha G nurse
Clifford Jeremiah
Barbour Rita Mrs
McMillen Pearl Mrs
Kirby Helen L Mrs
Brooks J O
Meyers Louis D
2971 Jolly Geo W
Day Melvin P
Garbin Robt F
Ohariette av
3109 Dalton Nellie T
3108 Howitson Chas
Smith Nellie
Ekwell Eyner
Monroe Geo
Nugent Arth
3119 Stebbins Louis E
3125 Scheid Lewis F
3130-34 Gruber Thos G
3145-47 Wallace Apts
Barquin Geo whol peanuts
Monzart Ida M Mrs
3159 Keller Eliz B
Smith Jessie nurse
3171 Bohy Alex E furn
Peterboro
3406 Staley Wm A
3409 Carr Wm janitor
Spiros Geo
Nicholson Malcolm
Mulligan John
Fox Frances
Hubbert Herbert W
Parker F
Lanigan Edw M
3410 Goreau Marg Mrs
3411 DeBoer Jas
3412 Seclusen N H
3414 Walsh Eunice A
3421 Doht Walter H
3428 Apartments
1 Mayer Stuart C
2 Planck Edw
3 Dinaman Roy
4 Bartlett Fred
5 Fleet Fred C
6 Denley John
7 Sandback Geo
8 Towning Lee
9 Vogel Michl
10 Bagnall Jas
11 Weiss Jack
Street continued
3429 Hogan Jas
3431 Apartments
1 Rice Fred M
2 Miller John
3 Miller Adam
4 Ross Saml
5 Gardin Harold
6 Rdifrey Geo
7 Hoey John
8 Gittin Vesta
9 May Mattie
10 Roberts Lloyd
11 Lane Chas
12 Dawson Clarence L
Street continued
3435 Syze Jas A
3444 Heather Hill Apts
Bowen Firesprooding Co
Heitt Bella M mgr
Bowen Jas D
Heiz Nora
Harding A M
Campbell Bruce
MacFarland Frederic
3445 Maynard Clo Mrs
3449 Hartway Louise L Mrs
3457-59 Smith Evelyn M Mrs
3458 Anderson Albert
3460-66 Fay Mabel Mrs
3474 Roberts John J
3514 Harlon Willis R
3516 Ryan Lavina Mrs
3532 Reeder Mary E Mrs
3525 Duff Ennis C
3527 Dean Mary L
Stimson av
nw cor Standard Oil Co
3531 Knott Carrie Mrs
3533-35 Lanahan Thos D
3533 Lundborg Albion J
3544 Rexmere Inn
Lenover Wm H
3545 Apartments
1 Vacant
2 Greenleaf Jacob
3 May J T
4 McIntyre Esther
5 Vacant
6 Gwynn H H
7 Chambers Wm
8 Patterson S
9 Vacant
10 Paul Stanley
11 Wolter Wm
12 Chapman Francis
21 Vacant
22 Garland W W
23 Lee Frank T
24 Coures Gust
25 Morrill Saml
26 Smith Peter
27 Vosberg Arth
28 Finley H
29 Coltman J O
3549 Apartments
1 Louis Marie
2 Wilson Thos
3 Vacant
4 Carpenter Violet
5 Powers Joe
6 Cleveland L R
7 Foreman John
8 Pacheco Gilbert
9 Roenicke Arlene
10 Marquard Wm
11 Vacant
12 Bird Alf
21 Mardahl Gustav
22 Harrison M A
23 Daghir Chas
24 Vacant
25 Gazey ——
26 Scott Peter
27 Valentine Winifred
28 Schleffer Peter J
29 Perritt Wm
30 Goldy D J
Street continued
3560 Nasser Chas gro
3552 Markley Orville E
Slater E W
3554 Miller Cleng & Dyers
3560 Academy Hotel
3562 Neumeister Paul baker
3564 Metropolitan Lunch
3565-69 Haley Patk E
3566 Kroger Gro & Bkg Co (br)
3568 Barber & MacKenzie drugs
3576 Conner Stillwell
Brainard
3577 Shakespeare Apts
1 O'Brien Frank
2 Carter Evelyn A
3 Hoffman Richd
4 Markle Alston F
5 Buchanan H J A
6 Caldwell A B
7 Wolfe S J
8 Fabrique Jennie Mrs
25 Doyle Louis
26 McGrovam Isabella Mrs
Street continued
3710 Delventhal Aug F
3711 Oriental Laundry
3713 Williams Ferris
3714 Kenny Clarence H
Miller Chas
Clay Chas
King Nell
Noel Stella Mrs
3715 Williams Ferris gro
3716 Smith Lester
3721 Wood Warren C
3722 Davis Roy E
Johnston Vernon
Temple Jas L
Hunter Frank
3723 Pulcifer Ira B
Lainz Glen B
Shea Wm S
Doyle John
Wallace Wm A
3730 Carlisle Harrington H
3727 Vest Chas L
3729 Walters Wm F
Otto Edith D drsmkr
Otto Elmina nurse
3733 Kishpaugh Fredk H
3734 Hibbard Louise M Mrs
3735 Dingman Elmer G
3745 McIntosh Livingston
3746 Fremont Frank
3751-53 Coronado Apts
1 Kew Diana Mrs
2 Farrar Marie
3 Dunbar Bessie Mrs
4 Gazey Saml
bsmt McElnay J F
3752 Prudhomme Harold J
Prudhomme Fred H
3753 Apartments
1 Emery Earl
2 Porterfield Jessie Mrs
3 Smith Marie M
4 Green L D
3760 Laura Apts
1 Barke Alice
2 Carten Harry
3 Gossett Jas
4 Smith John R
5 Marshall Robt
6 Molen Ethel
7 Hedson Lester
8 Hellisto Alex
9 Smith Wm
3761 Apartments
1 Hyde Myrtle
2 Howard Geo
3 Atkinson Thos
4 Vacant
3763 Apartments
1 Shepherd Geo C
2 Skarda Lewis
3 Beurer Victor J
4 Housel M Claude
3768 Olivia Hotel
Hoener Kath Mrs
3771 Apartments
1 Smith John F
3 Dumas Aurelia
3 Walker Anna
4 Salter Sarah
3775 Apartments
1 Thompson Minnie M
2 Vacant
3 Walters Fred H
4 Martin Verona
3776 Vacant
Selden av
2960 Selden Drug Co
2965 Warwick Apts
Gregorich Frank tailor
Porter Wm janitor
Apartments:
11 Rukin Max
12 Vacant
13 Starkey L
14 Rabas Jos
15 Vacant
16 McCann R M
17 Goulin Maurice
18 Keys E J
20 Duquette Harry
21 McLoughlin W N
22 Robinson Vera Mrs
23 Murphy Jas
24 Chadd W C
25 Fitzgerald J F
26 Stuart Wm
27 Keys R V
28 Vacant
30 Bellin Jos
31 Vise John
32 Monninger Harry
33 Boucher Wm
34 Burnsides Matthew
35 Dolan L
36 Ribaudeau F
37 Glaros C
38 Dalrymple G R
40 Stevens H R
41 Kroger E S
42 Dewey Wm
43 Linderman C W
44 Hamilton Kath
45 Kelly Frank
46 Marshman Grace
47 Joyner K
48 Spencer Theo
50 Ballard W J
51 Foley Jos
52 Todd Paul R
53 Lyons G
54 Saari John
55 Kanzas Roy
56 Stone Saml D
57 Hughes Earl
Hughes Jas
58 Holofcener Saul
60 Young Grace
61 Birchler A
62 Maloney L
63 Tippery F C
64 Pitcairn Hugh H
65 Bowen S T
66 Browne Paul
67 Stalker Edw
68 Martin Chas
Street continued
3910 Burkholder Gertrude Mrs
Billie Beauty Shop
3912 Harrison Jacob indry
3913A Vacant
3914 Selden Restaurant
3915 Cooper Ella M Mrs
3921 Kassarjian M M shoe repr
3922 Allen Bros gros
3926-38 Clark Chas
3929 Harvey Frank J
3935 Arthurs Ray R
3945 Dorothy Hotel
Wardrop Harold A
3946 Harger Austin E
Dixon Harry T
3951 Maxwell Apts
1 Mills W R
2 Brizette Eli
3 King Mabel R
4 Berry Mickl
5 Bernhardt Victor
6 Lacey Ralph E
7 Huntir Geo
Street continued
3954 Jackson Cath Mrs
Neely Kathleen nurse
Gunter G Waymond
Hughes E E
Davies Henry
Bratley Wm
Ames Floyd H
Ames Martha R drsmkr
3955 Lamson Laura Mrs
3961 Robbins Walter E
3963 Century Apts
B Miller Claud W
Netzorg. Myers B mgr
Apartments:
11 Hagle Lafayette
12 Campbell Hattie
14 Murton Trevir G
15 Kramer Marian
18 Vincent Rose
21 Fracne Frank
23 Porch E G
23 Stillson L R
24 Stricker Geo
25 Anderson Jos
31 Barrett J E
32 McBryant W
33 Gonatz A G
34 Murray Clifford E
35 Lloyd Edw
41 Vacant
42 Stewart H R
43 Seymour Harrison F
44 Chloss Mildred
45 O'Brien Thos D
51 Tremain Earl
Street continued
3969 Vacant
3972 Morgan Thos H
Sundy Pierce
Clark John
Thompson Robt L
3977 Symington Campbell
3980 Smith Chauncey G dentist
W Alexandrine av
4125 Meeker Clarence F
4132 Hayes Homer M
4134 Graffe Lawrence J

Target Street	Cross Street	Source
✓	-	Polk's City Directory

2ND AVE 1921

49 Scott Frances
50 Vacant
Street continued
3152—546 Glover Nettie B
3156—545 Keller Eliz B
3160—550 Gregory Grace M Mrs
3164-66—552-4 Dudley Apts
Smith Jas S
3171—555 Whetstone Carl F
Peterboro
3406—560 Hubbert Chas S
3409—559 Terpeney DuVal J
Hubbert W R Dr
Mulligan J E Mrs
3410—562 Ritzenhein H W
3411—561 Ayres Jas S
3414—564 Wilks Henry
3421—567 Pearsall Amos
3424-28—563-70 Crawford Norman E
3429—571 Aldrich A M Mrs
3434—574 Hale Fred O
3435—575 Knapp S J
3444—580 Jones Wm
3445—579 Wingate Harry
3449—581 McGlone Cora Mrs
3452—584 Jones Wm
3457—585 Russel Geo L
3458—586 Hoffman Clarence C
3459—585 VanElsbergen M Mrs
3460—590 Hanson Frank W
3466—592 Fay Mabel Mrs
3514—600 Harton Willis R
Snider Wm
3516—602 Fader Fred C
Ingmanson Alfold
Sebring Marceno O
Behringe Wm
Kilpatrick Jas
Walsh Paul
3522-24—604-606 Whitman F J
3525—605 VonBucek Kath A Mrs
3527—607 Perry G G
Stimson st
3527—607 Holland Cora E
Perry S Mrs, nurse
3531—609 Doughty Howard A
3532-34—610-12 Smith H, janitor
3533—611 Lundberg Albion
3544—618 Rexmere Inn
Gardner Levi S
3545-51—615-17 Goebel Flats
DeWharton C Fred
3552—620 Johnson Albert O
Souvign Arth E
Shelton Jessie A
Shaw John T
Dow Adell E
Rice Fredk L
3559—619 Valliere Henry, contr
3560—624 Winslow Fredk A
3565—621 Gray Edw
3568—628 Winslow Wm
3569—621 Pfeuke Fred E
3576—630 Sonkin Ben
Green Lewis D
Mantondon Wm L
King Edw A
Brainard
3577—629 Shakespeare Apts
Whirl Emma S Mrs
Fitch Benj C
Fillman G Mrs
McQueen J J Mrs
Conover Jay L
Redfearn Albert M
Tierney Thos T
Myers Mary E
Fillman Harold
David J E
Carter Reno
MacKenzie J D
3710—634 Loeb Henry F
3711—635 Mikla Alex, tailor
3713—637 Stone Louis
3714—636 Jackola Fredk
Albaugh Alva C
Buck Harry E
Kennedy Elliott 1
3715—637 Stone Louis, gro
3716—634 Loeb Henry F
3716—638 Droste Walter J
Christian Margt S Mrs
Whipple Anna M
3721—639 Dunn Earl J
Yenny Albert
3722—640 Wiley John Q
Spring Saml P
Kingsley Blanche
Adams Wm K
3723—639 Pulcifer Ira P
Green Willis H
3726—646 Carlisle Harry H
Miller R Allen
3727—643 Wallace Fredk J
Ratcliff W C
3729—643½ Steadman J Mrs
Cadot Howard E
3733—645 Kishpaugh Fredk H
3734—646 Hibbard Louise M
3735—645½ Meyerhuber Geo E
3745—647 Gourlay Alf L
Watson E M Mrs
Wingert Fanny M
3746—650 Fremont Frank M
3747—649 Brown Eva L Mrs
3751-73—655-65 Coronado Apts
Weidman Marie M
Murphy Ada S Mrs
Frye Floyd A
Ferguson M E Mrrs
3752—654 Prudhomme Fred H
3753—657 Kunze Mary
Savage Fredk M
Raines Bert
Haight Alice C
3760—656 Laura Apts
Clark Lena
Mason Mac
Clayton Almon J

Target Street	Cross Street	Source
✓	-	Polk's City Directory

2ND AVE 1916

17 Tinker Minerva B Mrs
18 Sheehan A S Mrs
21 Adams W E
22 Selker H M
23 Hunziger W J
24 Klein Frederick
25 Levy Henry
26 King G H
27 Sparklin W H
28 Hoyt Gladys
31 Gaudy R J
32 Salmon Dean
33 Vacant
34 Gordon Christine M
35 Graham Mary E
36 Osborne W V
37 Kain N S
38 Dailey J A, mus tchr
41 Switzer F I
42 Gordon Thor
43 McCallum Susan
44 Sage J C
45 Schillinger Rose D
46 Conley E L Mrs
47 Janes A F
48 Remsburgh F E

Street continued

451 Bailes Sarah Mrs
457 McClear Anna Mrs
459 Galvin M E
460 Munro J M, contr
Giroux Jos, nurse
465 Farwell E J Mrs
467 Foale Jessie Mrs
Coca Cola Bottling Co,r
468 Bushman F E
Weston H L r
472 Rechnitzer E R Mrs
474 Vacant
475 Milligan G W
478 Burnett Mary E
479 Oliver M M Mrs
485 Skidmore Malinda Mrs

Bagg (138) intersects

491-97 Ansonia Flats

491 Humphrey J R Mrs
Jorgensen John
Heller Regenia R
Kinmont M F Mrs
495 Lee A S
McIlvaine F B
Wagner H J C
Prikryl F S
497 Greene A J
Shanley James
Hayes J J

501-3 Waldo Apts

501 Gasgow Edw, janitor
Horner Gertrude C
Hannan E M Mrs
Forsythe Margt, drs-mkr
Maxey Roxey, drsmkr
503 Dudley M O Mrs
Briggs Neva
Suckling George
504 Morgan J W
505 Herkimer O R

506-8 Cromwell Flats

506 Ottig Geo, janitor
Williams R T
Beardsley C H
Kennedy J F
508 Schelling A A
VonHoya O F C
Manners W H
511 Jensen C O, realty

512-16 Altadena Apts

512 Gordon Kattie Mrs
Porter J H
Martin H E
Potts I S
514 Becker Meta
Drouillard H E
Johnston J W
Inslee C G
515 McKay Colin
516 Class W J
Christenson E E
MacDonough J E
Slagle H A
Groskoph H A jr
519 O'Donaghey W P

520-22 Manhattan Apts

Ruby F W, tailor
McGough A L Dr
Weist E W
Little V M
Hendry F T
522 Clarke Stanton
McAdam Alice C, nurse
Martin Florence, nurse
Martin Theresa, nurse
Martin Edna M, nurse
Dettinger Anna nurse
Meyers Abram D
Miller George
Thomas F P

Charlotte av (131) int

525 Rowe E M
531 Stebbins L E
532 Campbell Kath Mrs
535 Moutray Caroline G
537-39 Standard Oil Co
538 Cohen Abr, realty
540 King W A

541-43 Wallace Flats

541 Williams Margt Mrs
Wenzell A P

542-44 Sevilla Flats

542 Feeney Wm
McDougal W A
Newton D H
Newton Julia B
Collins M A Mrs
543 Darling H S
544 Balfour Grayce Mrs, nurse
Braucheau B F
545 Keller Eliz B
546 Glover Nettie B
550 Lindsay A J

552-54 Dudley Apartments

Buiters F A
Roy M M Mrs
Dudley Sarah Mrs
Zanger E F Mrs
Garland Anna M
Ledy Emma
555 Newton L C Dr

Peterboro (51) intersects

559 Hubbert W R
Reed George
Merriam Grace
Newitt Charles
Lowden H J D
Phelan F M
Ryan Matilda
560 Hubbert C S
561 Canny C C
562 Giddings J A
564 Lawrence D N
567 Doo Anna Mrs
570 Hoag M D
571 Schwartz H F
572-74 Risk W J
575 Watson H S
579 Knight G C
Hayes Jennie Mrs
580 Jones Wm
Skelly Anna E
581 Boardman W E
584 Blake Leonard
Crowley J J
Yokom F M
585 Scheid L F
586 Leech O J
587 Kosecka Frances
590 Bradley L A
592 Russell S C
594 Bopal L H

Pitcher (52) intersects

600 Harton W R
Redfern J H
602 Allison W J
604-6 Ladd Alfred
Markley Glen
Person D S
Wood K L
605 Roe Ada C
606 Vacant
607 McMahon P S
609 Bradford C R, exp
610-12 Smith Harry
611 Courtney J H

615-17 Goebel Flats

615 White T E Mrs
Lewellen E W
Parker F B
Rice L W
Graham M J
617 Goebel T P
Heilbronner L D
Ryan J J
Fennessy Mary Mrs
618 Rexmere Inn
Gardner L S
619 Lane W P
620 Forshee J M
Crook Fred
Whipple H M Mrs
621 Harrison C H Mrs
Nash H C
Gerard E W
623 Vacant
624 Winslow F A
628 Winslow Wm
630 Breese A C
Hope David

Brainard (54) intersects

634 Minkley R W
635 Lamerand L A
636 Guthrie G B
Riddett Wm G
Bennett L B Mrs

Target Street	Cross Street	Source
✓	-	Polk's City Directory

2ND AVE 1916

Second av.

638 Graham Mabel E
Christian M S Mrs
Wallace C M
639 Pulcifer J P.
Baker B J
Law James
640 Waltman Elizabeth
Baxtresser Earl
Beller Anna
Stetzer Wm R
642 Tyler D S
643 Hansen H A, landscape gardener
643½ MacDonald R W
Venci'l J H
645 Hallahan J H
645½ Shepner Wm H
646 Hibbard Louisa Mrs
647 Gourlay James
Gourlay A L
VesSells O E
649 Brown E L Mrs, drsmkr
650 Collins E M Mrs
654 Kammer Wm H
Zink M A, drsmkr
655-65 Coronado Flats
Pease Nellie Mrs
Fullington G H
Streit Sadie Mrs
Beach Winifred Mrs
656 Weeks H L
657 Boulden G K
Gutch Caroline
Potter F R
Powell A J
658 Wright C H
659 Thompson C J Mrs
Hurst E E Mrs
Ford Frances Mrs
Hemenway R C Mrs
660 Canfield Wm E
661 Lane P A
White F E
Daniels Frances Mrs
Reynolds Lucy Mrs

Target Street	Cross Street	Source
✓	-	Polk's City Directory

2ND AVE 1911

420 Cochran Wm J
" Derry Walter E
" Cameron John
" Pierce Edward
" O'Brien John
" Leslie Frank
421 Culhane Ellen Mrs
" Hatch Alice J Mrs
" McGregor Robert B
" Lapham A S Mrs
" Smith Welcome C
" Macbeth Margaret Mrs
423 Braun George C, cafe
" Hill Harry
" Blanchand Wm A
" Schroeder Carl
" McCall Grover
" Bradley Robert
424 Doraa Mary Mrs
" Hunter Fannie Mrs
430 Brown E L Mrs, drsmkr
" Albertus Harold V
438 Voigt Edward W
Ledyard (47) intersects.
n e cor Central Christian Ch
445 Roehm Charles G
449 Nicholson Wayland B
" Watson Walter J
451 Clark Katherine G Mrs
" Shucker George
" Noyes Charles M
" Thurston Charles O
" Woodhouse Wm
" McClear Louis W
457 Neal Wm J
" Ransom Ezra
" Sherrod Lorenzo J
459 Galvin Martin E
460 Munro James M, contr
" Seymour A M
" Porter James
" Cooper Stanley M
" Harrison Wm H
" Dietz George W
465 Farwell Emma J Mrs
467 Godfrey Marshall H
" Coca Cola Bottling Co
468 Bushman Franklin E
" Powell James J
472 Karst Catherine
" Sage Joel
474 Campbell John O
475 Moore Albert E
" Odell Arthur
" Sharpe Charles F
478 Speed John J
479 Oliver Jefferson D
" Wethrell Fred
" Carroll W J
485 Skidmore Malinda Mrs
" Marsh Elihu
Bagg (128) intersects.
491-497 **Ansonia Flats.**
491 Bird Charles E
" Chase Jessie C
" Heller Regenia R
" Heller Hannah
" Kinmount Mary F
495 Kilpatrick Arthur W
" Lee A Sheldon
" Maynard A R
" Wendell C Albert
497 Hayes John J
" Hoskins Frank E
" Palmer Charles
" Watkins George B
501-3 **Waldo Apts**
501 Reichenbach Jos, painter
503 Parsons Augustus S
" Callahan Nellie C
504 Morgan James W
505 Behan Frank
" Nevison Etta Mrs
" Harrison Eugene
" Manning Charles E
" Banks Albert
" Downey Guy
506-508 **Cromwell Flats**
506 Fullington George H
" Myers Harry G
" Proctor Charles G
508 Delmarsh Kate G
" Schmidt Wm
508 Thompson Charles D C
e s Vacant
511 Bronson Imelda B Mrs
" Armstrong Lillian
" McGregor Minnie, nurse
" Traver Grace E, nurse
515 Campbell Elizabeth Mrs
" Evans Thomas D
515 Addeman Fred B
519 Leete Fredk D Rev
520-522 **Manhattan Apts.**
" Ruby Fredk W, tailor
" De Hart Leon J
522 Pierce Marcenus L, drugs
" Cadwallader Chas H
" Cook Charles G
" Henry James R
" De Blois Wm M
" De Blois Rhoda F, M D
" Moon Lee D
" Killinger Henry
" Coulson John G
Charlotte av (131) intersects.
525 Minnis Robert P
531 Barr Horatio
532 Simmons Charles H
535 Hachereile Louis E, tailor
538 Cohen Abraham
540 King Wm A
" Muir John S
541-543 **Wallace Flats.**
" Martin John B, janitor
" Pierce Marcenus L
" Mangan John
" Curtis Ellen W Mrs
" Hull Isabella H
" May Ada
543 Paisner Esther B
" Harbert Anna, nurse
" Davidson James R
" Downing W Robert
" Hollingsworth John D
" Dewey Mary M Mrs
544 **Sevilla Flats.**
" Black Octavia C Mrs
" Newton David H, M D
" Williams Ida E Mrs
" Dudley Maude O Mrs
" Condell Wm T
" Goodson John W
" Runions Anna L Mrs
" Glover Nettie B
550 Carleton Monroe P
552-554 **Dudley Apartments.**
" Zanger Electa F Mrs
" Butters Fred A
" Giffin Clifford
" Barber Louise Mrs
" Pfannenschmidt Louise
" Holtsclaw James L
555 Newton Lumus C, M D
Joy (51) intersects.
559 Hubbert Wm R
" Thomason Ellen A Mrs
561 Vacant
567 Beard George R
568 Whitaker Wm H
570 Ellison Henry I
571 Groverman Wm H
572 Yearick Cicero R
574 Thorpe John V
575 Gager Edwin C
579 Horsman Thos J
580 Whitmarsh Wm H
581 McGarry John J
584 Duffield Geo, M D
585 Flower Fredk
586 Brenner Geo W
587 Griffiths Thomas
590 Gawron David J
592 Hopp Charles
591 Bostrom Charles O
Pitcher (52) intersects.
600 Harton Willis R
" Johnson Charles B
602 Feiman Benjamin
" Longren Henry
604 Botken John W
605 Gledhill Geo E
606 Berdan George A
607 McMahon Percy S
609 Blessed Sara J Mrs
610 Brubaker Guy H
611 Bidwell George M
612 Reville Florence A
615 **Fanning Flats.**
" Moyer Nardell
" Walker Walter C, M D
" Lewellen Emery W
" Powell Alfred J
617 **Goebel Flats.**
" Goebel Theodore P
" Eagling Norman J
" Ryan John J
" Fennessy Mary Mrs
618 Mills Mary H Mrs
" Wittmei Daniel E
619 Lane Wm P, M D
620 Winslow Frederick A
" Laughlin Stella A Mrs
621 Harrison Clara Mrs
623 Gilman Baxter H
624 Sullivan John H
628 Winslow Wm
630 Hope David
" Flemming Frank L
" Keese Paul
" Mathews Saml J
Brainard (54) intersects.
635 Gale Laura B Mrs
" Smith Henry J jr
" Love Wm J
" Byerly Julia P Mrs
" Cole Donald I
" Bennett Louise B
638 Elsemore Hammond T
" Christian Margt s Mrs
" Elsemore Orville E
" Tilden Henrietta Mrs
639 Burdick Florence V Mrs
640 Smith Lucile I Mrs
642 Gates Jasper C
643 Charlesworth Ellen Mrs
645 Crellin John S
645½ Vacant
646 Hibbard Eliphaz S
647 Gourlay James
" Gourlay Alfred L
" Kennedy Louise M
649 Olinger Jos P
650 Collins Eliz M Mrs
654 Coates Oliver M
" Kennedy Marshall
655-665 **Coronado Flats**
" Farmer Orphia L Mrs
" Black Maurice
" Streit George B
" Beach Winifred C
656 Cartwright Daniel L
657 Boulden Anna K Mrs
" Potter Frank R
" Mead Earl A
" Gibson Hiram F
659 Reed John J
" Power George G
" Taylor Frank O
" Thomas Henry A
661 Pettingill Proctor C
" Wheeler Fayette H
" Wilson Eliza Mrs
" Daniels Mary J Mrs
662 Walsh Julia
663 Ferguson Wm T
" Hutton M Louise Mrs
" Miller Harry O
" Hutton Wm H H
664 Dunbar Thomas M
665 Button John F
" Hart Fannie E Mrs
" Starbuck Raymond D
" Barie Hiram W
Selden av (140) intersects.
669 Parkinson Ida J
670 Barrett Carrie Mrs
675 Groesbeck Wm C
677 Dennis Arthur S
680 Gabell Herman L
683 Shriner Frank E
684 Naylon John
685 Dupont Fredk A
" Kern Josephine Mrs
688 Kennedy John H
" Cochrane Anna, nurse
" Lee Harriett E, nurse
" Walker Alice E, nurse

10.5 Regulatory Records Documentation: The EDR Radius Map Report with GeoCheck, Online Assessing Records, and EGLE Perfected Environmental Liens (10-11-19)

3515 2nd Avenue
3515 2nd Avenue
Detroit, MI 48201

Inquiry Number: 6013759.2s
March 18, 2020

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

APPENDIX OMITTED

3515 SECOND 48201 (Property Address)

Parcel Number: 04000689-90

Item **1** of **12** 12 Images / 0 Sketches

Property Owner: BAZZI, JAMAL

Summary Information

> Assessed Value: $183,400 | Taxable Value: $65,638

> Property Tax information found

Owner and Taxpayer Information

Owner	BAZZI, JAMAL 27030 DOXTATOR DEARBORN HEIGHTS, MI 48127	**Taxpayer**	SEE OWNER INFORMATION

General Information for Tax Year 2019

Property Class	202-COMMERCIAL VACANT	**Unit**	01 CITY OF DETROIT
School District	DETROIT PUBLIC SCHOOLS	**Assessed Value**	$183,400
WARD#	04	**Taxable Value**	$65,638
DISTRICT	4	**State Equalized Value**	$183,400
ASMT CODE	*Not Available*	**Date of Last Name Change**	05/24/2017
RELATED #	*Not Available*	**Notes**	*Not Available*
Historical District	*Not Available*	**Census Block Group**	*Not Available*
COUNCIL #	*Not Available*	**Exemption**	*No Data to Display*

Principal Residence Exemption Information

Homestead Date *No Data to Display*

Principal Residence Exemption	June 1st	Final
2019	0.0000 %	0.0000 %

Land Information

Zoning Code	SD2	**Total Acres**	0.356
Land Value	$366,800	**Land Improvements**	$0
Renaissance Zone	No	**Renaissance Zone Expiration Date**	*No Data to Display*
ECF Neighborhood	*Not Available*	**Mortgage Code**	*No Data to Display*
Lot Dimensions/Comments	*Not Available*	**Neighborhood Enterprise Zone**	No

Lot(s)	Frontage	Depth
Lot 1	100.00 ft	155.00 ft
	Total Frontage: 100.00 ft	**Average Depth: 155.00 ft**

Legal Description

N MYRTLE 18 S 120 FT 17 BLK 90 CASS FARM SUB L1 P175-7 PLATS, W C R 4/34 100 IRREG

Sale History

Sale Date	Sale Price	Instrument	Grantor	Grantee	Terms of Sale	Liber/Page
04/15/2017	$300,000.00	WD	WEATHERLY, JEREMIAH & ADDIE	BAZZI, JAMAL	VALID ARMS LENGTH	2017170245
06/19/2004	$0.00	PTA	LUDY, QUINON	WEATHERLY, JEREMIAH	NO CONSIDERATION	

REMEDIATION AND REDEVEOPMENT DIVISION PERFECTED LIEN LIST

The Department of Environmental Quality (DEQ), Remediation and Redevelopment Division (RRD) has perfected liens on property pursuant to Section 20138 of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), MCL 324.20101 *et seq*.

The following is a current listing of liens perfected by the RRD on property as of the date that appears on this list. The list will be updated **only** when the RRD has perfected a new lien on a property or has released a lien from a property. A new date will then appear on the list. This list does not include any lien(s) that may have been perfected by another DEQ Division or other entity. For information regarding this list, please contact Paul Johnson at 517-614-2058 or by e-mail at johnsonp1@michigan.gov. For lien information related to the Resource Management Division or Oil, Gas & Minerals Division, please call 517-335-6766 respectively.

The information provided herein cannot be construed or interpreted as legal verification that a perfected lien does not exist on a particular property, or that a lien is the only perfected lien on a property. To obtain legal verification, you must access official records from the appropriate County Register of Deeds and/or the Michigan Secretary of State when applicable.

County	*Township*	*City/Vlg*	*Address*	*Other Description*	*Lot No*	*Section*	*Town*	*Range*	*Tax Code*
Allegan				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Allegan	Watson					24	T2N	R12W	23-24-001-10
Allegan	Watson					24	T2N	R12W	23-24-001-10
Allegan				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Alpena		Alpena	4709 Long Rapids Rd.	Lake Winyah Shores Sub	Lot 43				
Antrim		Ellsworth	Vlg. Of Ellsworth			14	T32N	R8W	05-44-013-061-00
Antrim		Ellsworth	Vlg. Of Ellsworth			14	T32N	R8W	05-44-023-004-00
Antrim	Milton	Rapid City	12929 Cherry Ave.	Plat of New Highlands	Lot 14				
Antrim		Riverview	6235 Crystal Springs Rd.	Supervisor's Plat of Riverview	Lot 1				

County	Township	City/Vlg	Address	Other Description	Lot No	Section	Town	Range	Tax Code
Arenac	Mason	Turner	50 Mason Road			12	T20N	R5E	
Arenac	Mason	Turner	50 Mason Road			12	T20N	R5E	
Arenac		Standish	105 N. Main	Assessor's Plat 5	Lot 370				40-2-500-000-370-00
Baraga	L'anse	L'anse	Winter St.			9	T50N	R33W	
Benzie		Lake Ann Vlg	P.O. Box 62 1st St.		Lots 7 & 9, Blk 28				
Berrien				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Berrien	Benton	Benton Harbor					T4S	R18W	11-045-18W-05DB
Berrien				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Berrien		Watervliet				2	T3S	R17W	11-21-0002-0015-01-0
Berrien		Watervliet	106 E. St. Joseph St.	Sutherland's Addition	Lot 1, exceptions				
Berrien		Watervliet				2	T3S	R17W	11-21-0023-0014-01-6
Branch	Butler		1031 Clarendon Rd., Quincy, Michigan			15	T5S	R5W	
Branch	Algansee	Quincy	144/146 Crocket Drive	Woodland plat	Lot 2,3 & land	5	T7S	R5W	
Branch	Butler		1031 Clarendon Rd., Quincy, Michigan			15	T5S	R5W	
Branch	Algansee	Quincy	144/146 Crocket Drive	Woodland plat	Lot 2,3 & land	5	T7S	R5W	
Calhoun	Bedford	Battle Creek		Facility ID 00005228	66, 67, + land	29	T1N	R8W	13-04-360-058-W
Calhoun	Bedford	Battle Creek		Facility ID 00005228	66, 67, + land	29	T1N	R8W	13-04-360-058-W
Calhoun	Marengo	Marshall	1035 East Michigan Ave.			19	T2S	R5W	

County	Township	City/Vlg	Address	Other Description	Lot No	Section	Town	Range	Tax Code
Cass				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Cass		Dowagiac	111 North Front St.	Patrick Hamilton's Add	Lot 12				
Cheboygan		Cheboygan		J M Pennell's First Add to city	Lot 13, Blk 8				
Chippewa		Dafter	9976 Soo Line Rd.			21	T46N	R1W	
Delta	Masonville	Rapid River	US2	H.W. Cole's Second Add	Lots 7,8 Blk 11	29	T41N	R21W	21-012-341-007-00 & 21-012-179-021-00 & 21-012-179-020-00
Eaton		Grand Ledge	105 E. Saginaw Hwy	Supervisors Plat #2	Pt of Lot 179				23-400-078-001-790-00 & 791-00 & 791-01
Genesee		Flint	3402 Martin Luther King or 121 E. Pasadena		Lots 548 & 549				
Genesee	Genesee					33	T8N	R7E	R-1006-22
Genesee		Flint	603 Pingree Ave	Elm Park Sub	Lots 187-195, 196, 230				11-17-352-0187-87
Genesee	Genesee					33	T8N	R7E	R-1006-22
Genesee		Flushing	90 E. Main St.	Assessor's Plat #5	Pt of Lot 98,				
Genesee		Burton	5516 Davison Rd			11	T7N	R7E	59-11-200-006
Genesee		Flint	3402 Martin Luther King		Lots 544, 545, & 546				
Genesee		Flint	603 Pingree Ave	Elm Park Sub	Lots 187-195, 196, 230				11-17-352-0187-87
Grand Traverse	Blair					7	T26N	R11W	
Grand Traverse	Blair		5175 Sawyer Wood Dr	Woodland Terrace Annex	Lots 1-4 Blk 18	7	T26N	R11W	28-02-007-047-20
Grand Traverse	East Bay						T27N	R10W	28-03220-020-00
Hillsdale	Moscow					15	T5S	R2W	30-03-015-200-012-15-5-2
Hillsdale	Scipio		Mosherville Rd.			10	T5S	R3W	30-02-010-100-011
Houghton	Franklin			Julio Salvage Site I.		31	T55N	R33W	006-031-034-00

County	Township	City/Vlg	Address	Other Description	Lot No	Section	Town	Range	Tax Code
Houghton	Franklin			Julio Salvage Site G.	1-10	34	T55N	R33W	006-166-001-00 and 006-031-032-00
Houghton	Franklin & Osceola			Julio Salvage Site L.		32 &33	T55N	R33W	003-032-026-00 and 009-033-037-00
Houghton	Osceola			Julio Salvage Site N.		33	T55N	R33W	009-033-055-00
Houghton	Franklin			Julio Salvage Site D.		25 & 36	T55N	R34W	006-136-002-00
Ingham		Lansing	300 North St.	Turner & Smith's Sub of Lot 6 of Townsend Sub.	Lots 1,2, & Pt. 3 of Lot 6				
Ingham		Lansing	3125 MLK Blvd			29	T4N	R2W	33-01-01-29-476-041
Isabella		Mt. Pleasant	226 S. Main St.		Lot 1 & Pt 2, Blk 25				
Kalamazoo	Alamo					26	T1S	R12W	01-26-251-019
Kalamazoo		Vlg. of Vicksburg		Wolverton's Revised Addition		18	T4S	R10W	39-15-18-100-018
Kalamazoo		Kalamazoo	3501 South Burdick St.	Supv Plat of Henry Johnson Plat	Lot A				
Kalamazoo	Wakeshma	Fulton	13995 East W Ave.			16	T4S	R9W	16-16-490-190
Kalamazoo		Portage	9008 Portage Rd.	Ames West Lake Pk.	Lots 58,59,60				
Kalkaska	Kalkaska					29	T27N	R7W	
Kalkaska	Kalkaska					29	T27N	R7W	
Kent		Grand Rapids	2555 Oak Industrial Drive			22	T7N	R11W	
Kent		Wyoming	2539 28th St, SW			9	T6N	R12W	41-17-09-451-013
Kent		Wyoming	2539 28th St, SW			9	T6N	R12W	41-17-09-451-013
Kent		Grand Rapids			6,7,8,4,5 + add parcel				41-14-19-330-017
Lake	Pleasant Plains		M-37	Pere Marquette Plat	107,108,78,79	22	T17N	R13W	43-17N-13W-22BD
Lake	Pleasant Plains		M-37	Pere Marquette Plat	Lot 2052,53,80-83,103-106	22	T17N	R13W	
Lake	Pleasant Plains		M-37	Pere Marquette Plat	part of 20,21	22	T17N	R13W	
Livingston	Putnam					27	T1N	R4E	14-27-400-002 30147080

County	Township	City/Vlg	Address	Other Description	Lot No	Section	Town	Range	Tax Code
Livingston				A judgement lien in case 12-26969-CE is against all of the properties owned in Livingston County by Patrick Jay Conely (Sr). If this individual is in the chain of title as of 9/18/2019, it is likely to be subject to this lien.					
Livingston		Fowlerville	306 E. Grand River	Fowler's First Add	Lot 39 Blk 2				05-11-302-014
Livingston	Hamburg		10776 Hall Rd			25	T1N	R5E	47-15-25-400-014
Livingston	Hamburg		10776 Hall Rd			25	T1N	R5E	47-15-25-400-014
Livingston		Brighton		Smith & McPherson Addition	219,220,221	30	T2N	R6E	18-30-300-017
Livingston		Brighton		Smith & McPherson Addition	219,220,221	30	T2N	R6E	18-30-300-017
Macomb	Chesterfield					PC 192	T3N	R14E	09-21-251-002
Macomb	Macomb	Warren			Lot 33 & 13				13-19-353-004
Macomb	Chesterfield					PC 192	T3N	R14E	09-21-401-003
Macomb	Chesterfield					PC 192	T3N	R14E	09-21-401-003
Macomb	Macomb	Warren			Lot 33 & 13				13-19-353-004
Macomb	Chesterfield					PC 192	T3N	R14E	09-21-251-002
Macomb	Shelby				#63,64				07-18-401-005,50-07-593-063-00; 07-18-401-004, 50-07-593-064-00
Monroe	Bedford					28	T8S	R7E	58-08S-07E-28BA
Montcalm	Reynolds	Howard City				35	T12N	R10W	59-017-900-083-00 or 092-00
Montcalm	Winfield		15350 West Howard City/Edmore Road			16	T12N	R9W	59-020-016-008-01
Montcalm	Winfield		15350 West Howard City/Edmore Road			16	T12N	R9W	59-020-016-008-01
Montcalm	Reynolds	Howard City				35	T12N	R10W	59-017-900-083-00 or 092-00
Montcalm	Bloomer					12	T9N	R5W	59-051-700-040-00
Montmorency		Atlanta Vlg	103 State St. Box 615		Lots 5 thru 11, Blk 7				

County	Township	City/Vlg	Address	Other Description	Lot No	Section	Town	Range	Tax Code
Newaygo	Everett					17	T13N	R12W	
Newaygo	Everett					17	T13N	R12W	
Oakland	Farmington	Farmington	29024 Grand River	Richland State Sub. Resub of Richland's Gardens Sub	Lots 45-51	36	T1N	R9E	23-36-304-022
Oakland	Waterford/ White Lake					7&18 12	T3N T3N	R9E R8E	13-07-100-008 12-12-200-007
Ogemaw	Hill	Lupton	3610 Forest Dr.	Shady Shores Park sub of Gov't Lot 2&3	Pt Lot 1 Blk A, Pt. of Lot 8	8	T23N	R4E	
Osceola	Orient					21	T17N	R7W	67-11-021-021-10 67-11-021-022-10
Osceola	Hartwick					1	T19N	R8W	67-04-001-001-00
Osceola		Evart	202 E. Seventh		479				
Ottawa				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Ottawa	Crockery	Vlg of Nunica		Adsit's Add	Lot 3, Blk 3	15	T8N	R15W	70-04-15-430-018 70-04-14-320-002
Ottawa	Tallmadge				Gov't 4	12	T6N	R13W	70-14-12-400-003
Ottawa		Grand Haven		Rycenga's Plat 3	197	21	T8N	R16W	70-03-21-415-018
Ottawa				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Presque Isle	Presque Isle			Lot 17, of SUPERVISOR'S PLAT OF SPRINGFIELD CAMP	17				
Presque Isle	Presque Isle			Lot 17, of SUPERVISOR'S PLAT OF SPRINGFIELD CAMP	17				

County	Township	City/Vlg	Address	Other Description	Lot No	Section	Town	Range	Tax Code
Presque Isle	Presque Isle		17661 Grand Lake Blvd.		17				
Presque Isle	Presque Isle		17661 Grand Lake Blvd.		17				
Shiawassee	Shiawassee					26	T6N	R3E	
Shiawassee		Owosso	1725 Corunna Ave.	A V Johnson's Add	Lots 4,5,11, 12,13 Blk 8				
Shiawassee	Shiawassee					26	T6N	R3E	
Shiawassee		Owosso	210-300 E Monroe St.	A L Williams Second Addition	Blk 1= 9,10,1; Blk 2 = 1-13 AL Williams Second Add	24	R2E	T7N	78-010-652-001-004
St. Joseph				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
St. Joseph	Colon					3	T6S	R9W	
St. Joseph	Colon					3	T6S	R9W	
Tuscola	Wisner	Fairgrove	9006 Bay City Forestville Rd.		Parcel B	29	T14N	R7E	10-01-0004-790-06
Tuscola		Caro		Plat of Centerville (Caro)	1and pt 2 Blk23	3	T12N	R9E	
Van Buren				A judgement lien in case #11-156-CE is against all of the properties owned in several counties by Ronald G. Strefling, Strefling Oil Company, or SREI Investments #1. If these entities are in the chain of title, they are likely to be subject to this lien.					
Wayne		Woodhaven				28	T4S	R10E	59-080-99-0008-000
Wayne		Woodhaven				28	T4S	R10E	59-080-99-0008-000
Wayne	Brownstown	Flat Rock				28	T4S	R10E	58-081-99-0002-000
Wayne		Detroit	4445 Lawton aka 4450 Lawton	Plat of RR Concessions, PC 729	41-58, Out Lot 8,				

County	Township	City/Vlg	Address	Other Description	Lot No	Section	Town	Range	Tax Code
Wayne	Brownstown	Flat Rock				28	T4S	R10E	58-081-99-0001-000
Wayne	Brownstown	Flat Rock				28	T4S	R10E	58-081-99-0002-000
Wayne		Detroit 48227	14000 Fenkell	Davy's Fenkell Ave Sub	Lots 33-36				
Wayne		Woodhaven				28	T4S	R10E	59-080-99-0004-000
Wayne	Brownstown	Flat Rock				28	T4S	R10E	58-081-99-0001-000
Wexford		Cadillac		Outlot 6 Cummer & Hayes Add.	Outlot 6				10-056-00-026-00
Wexford		Cadillac	Blk 14		4,5,6				

10.6 Interview Documentation: MSHDA User's Questionnaire, Development Plan, User Provided Construction Permits

SECTION VIII: 2020 - USER'S ENVIRONMENTAL QUESTIONNAIRE AND DISCLOSURE STATEMENT

The Authority requires the completion of its "User's Environmental Questionnaire and Disclosure Statement" to fulfill Section 6, User's Responsibilities of the ASTM Standard E 1527-13. **The checklist is to be completed and signed by the sponsor (developer), and returned to the Environmental Professional conducting the Phase I. This questionnaire is to be reviewed by the Environmental Professional and incorporated into their Phase I report (the completed User's Questionnaire is to be included in Appendix 10.6 of the Phase I report). Failure to properly complete this process will result in delays.**

In preparing this document, the **"User" (Sponsor)** must make a good faith effort to answer the questions in the checklist. The User or a preparer designated by the User presents that to the best of his/her knowledge, the above statements and facts are true and correct and that to the best of the preparer's knowledge, no material facts have been omitted or misstated. Time and care should be taken to check whatever records are in the User's possession. If any of the following questions are answered in the affirmative or if answers are unknown, are qualified, or cannot be obtained, the burden is on the Environmental Professional to determine whether further inquiry is appropriate. The User should document the reason for any affirmative answer to provide the Environmental Professional with all appropriate information. Moreover, the Environmental Professional must determine if further inquiry in any area where the property owner provides incomplete information is warranted, providing written explanation for their recommendation(s).

In order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Relief and Brownfield's Revitalization Act of 2001 (the "Brownfield's Amendments"), the User must provide the following information (if available) to the Environmental Professional. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

User's (Sponsor's) Name: T. Van Fox

User's (Sponsor's) Telephone No.: 248-833-0550

Subject Property: MLK on 2nd

Property Address: 3515 Second Avenue

City: Detroit **State:** MI **Zip:** 48201

1.0 **Environmental Cleanup Liens:**

Are you aware of any environmental cleanup liens against the property that are filed, recorded, or unrecorded under federal, tribal, state, or local law?

☐ YES ☒ NO If YES, please describe:

2.0 **Activity and Land Use Limitations:**

Are you aware of any activity and land use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed, recorded or unrecorded in a registry under federal, tribal, state or local law?

☐ YES ☒ NO If YES, please describe:

3.0 **Specialized Knowledge or Experience of the User:**

(a) As the user of this ESA do you have any knowledge or experience related to the property or nearby properties that could be material to any environmental conditions of this property?

☐ YES ☒ NO If YES, please describe:

(b) Are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?

☒ YES ☐ NO If YES, please describe:

Currently vacant land
Adjoining property is multifamily housing - unsure of ownership/management's use of chemical on their property

4.0 **Relationship of Purchase Price to Fair Market Value:**

(a) Does the purchase price being paid for this property reasonably reflect the fair market value of the property?

☒ YES ☐ NO If YES, please describe:

(b) If you conclude that there is a difference, have you considered whether the lower price is because contamination is known or believed to be present at the property?

☐ YES ☐ NO If YES, please describe:

5.0 **Commonly Known or Reasonably Ascertainable Information:**

Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example, as user,

(a) Do you know the past uses of the property? Please list: currently vacant land

(b) Do you know the specific chemicals that are present or once were present at the property?

☐ YES ☒ NO If YES, please describe:

(c) Do you know of spills or other chemical releases that have taken place at the property?

☐ YES ☒ NO If YES, please describe:

(d) Do you know of any environmental cleanups that have taken place at the property?

☐ YES ☒ NO If YES, please describe:

6.0 **Presence or Likely Presence of Contamination:**

As the user of this ESA and based on your knowledge and experience related to the property, are

there any obvious indicators that point to the presence or likely presence of contamination at the property?

☐ YES ☒ NO If YES, please describe:

User's Signature: _____ Date 3-20-2020

User's Printed Name: T. Van Fox

MLK Avenue
100 feet
5 ft set back
Second Avenue
90 feet
NEW MIXED-USE
3515 Second
25, 1-Bedroom Residential Units
Commercial
2,054 s.f.
Parcel I.d. 0100187-6
Fire Riser + Water Meter
Elev. Mach. Room
Maintenance
Lobby
Mail
Community Room 500 s.f.
Unisex
Mechanical
5 ft set back
50 feet
10 feet wide
Parking Lot
40' x 155'
19 spots x 8 feet wide = 152'
~ 19 parking spots
Each spot is 18 feet long
155 feet
50 feet

City of Detroit

Buildings, Safety Engineering and Environmental Department

4TH FLOOR COLEMAN A. YOUNG MUNICIPAL CENTER

WRECKING PERMIT

City: (313)224-3215 Private: (313) 224 3202

PERMIT NO.: BLD2018-03484
APPLIED: 5/29/2018
ISSUED: 5/29/2018
EXPIRES: 11/29/2018

LOCATION: 3515 SECOND
BETWEEN: THIRD and SECOND
LOT NO AND SUB: CASS FARM (ALSO P176-7 P and 18;
PERMIT TO: Dismantle
LEGAL USE: USED AUTO SALE
PROJECT DESCRIPTION:

ZONE DIST: SD2 USE GRP: B SIZE: 15,507.00 FL AREA: 1,421.00 GROUND AREA: 0.00
SECTOR: 4 STORIES: BASEMENT: N BLDG TYPE CODE: 3B - MASONARY (FP 200)
CUBIC FT.: 21,000.00 WIDTH 28.00 LENGTH: 50.00 HEIGTH: 15.00 NO.BLDGS: NO UNITS:

OWNER/APPLICANT	CONTRACTOR
JAMAL BAZZI 27030 DOXTATOR DEARBORN HGTS MI 48127 (313) 461-0505	BERKSHIRE DEVELOPMENT 525 GOLF CREST DR DEARBORN MI 48124

Fees

Type	By	Date	Amt. Due	Amt. Paid
			$108.00	108.00
			Total:	**$108.00**

REMARKS: WRECK AND REMOVE DEBRIS

BARRICADE INSPECTION REQUIRED.

BARRICADE OR BACKFILL TO GRADE LEVEL OPEN EXCAVATION CREATED.

CONDITIONS OF APPROVAL:

24 Hour Notice Required For All Inspections

Uninspected permits expire within 180 days

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
GENERAL ADMINISTRATION

735 RANDOLPH STREET
DETROIT, MICHIGAN 48226
WWW.DETROITMI.GOV

NO WATER SERVICE

May 25, 2018

Gentlemen:

Regarding the Water Service:

Account Number: 130-1150.300
Service Addresses: 3515 2nd Ave.

A review of our records indicates that there is no water service to the above–mentioned account. The water service was disconnected and a clearance for demolition on March 22, 2010

Sincerely,

Dworlett Garner, CSS II
Permits/Demolitions
Permits

dg

Pre-Demolition Asbestos Survey

3515 2nd Avenue
Detroit, Michigan

Property as it appeared on _____, 2018

Prepared By:

E.S.E.T., Inc.
14611 Melrose Street
Livonia, MI 48154

Date: June 19, 2018

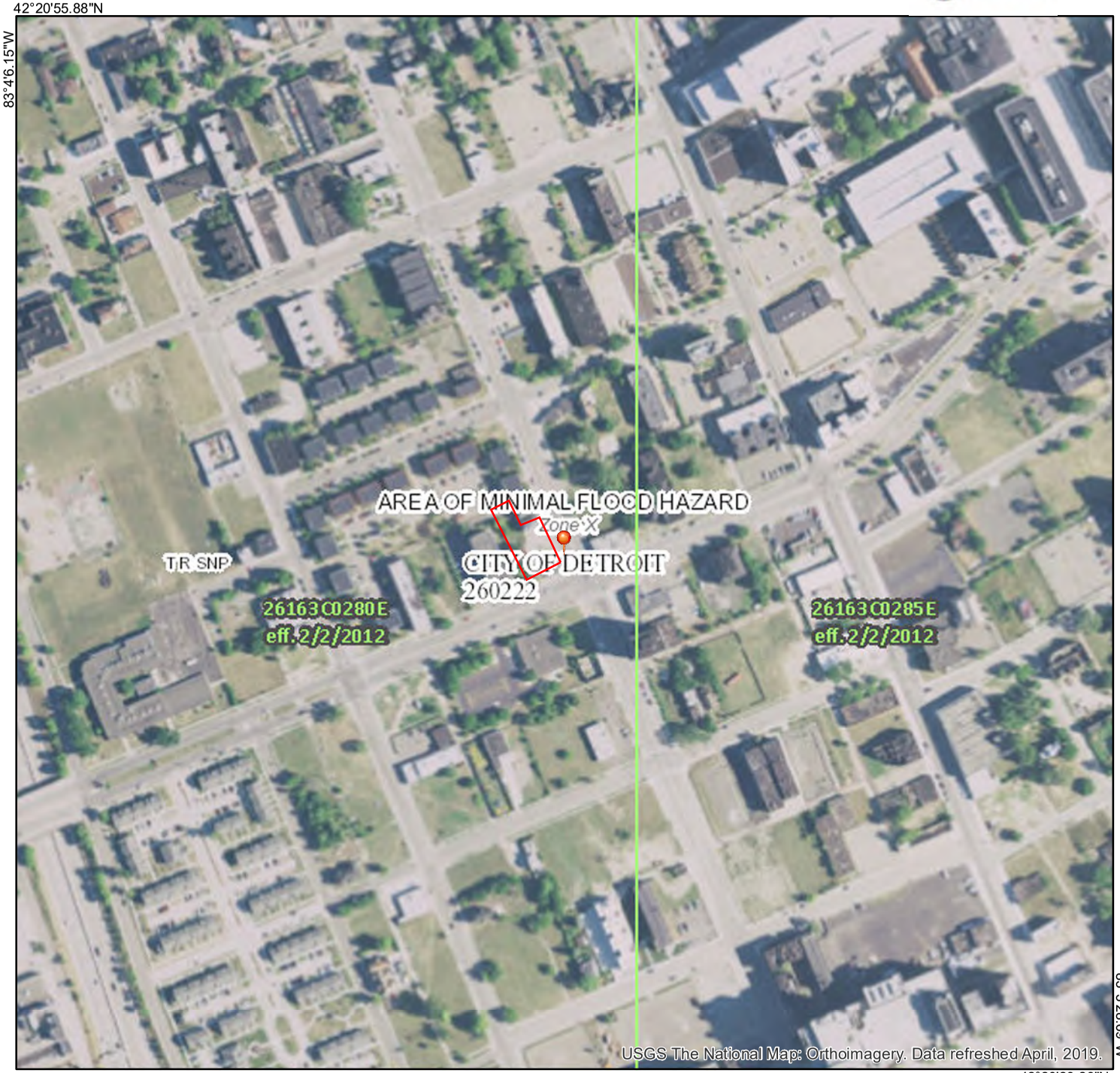
10.7 Special Contractual Conditions Between User and Environmental Professional: FEMA Firmette Map, National Wetlands Inventory Map, U.S. DOT National Pipeline Mapping System Map, Noise Assessment, and Acceptable Separation Distance Calculations

National Flood Hazard Layer FIRMette

FEMA

42°20'55.88"N

83°4'6.15"W



83°3'28.69"W

42°20'29.29"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/6/2020 at 5:01:45 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

U.S. Fish and Wildlife Service

National Wetlands Inventory

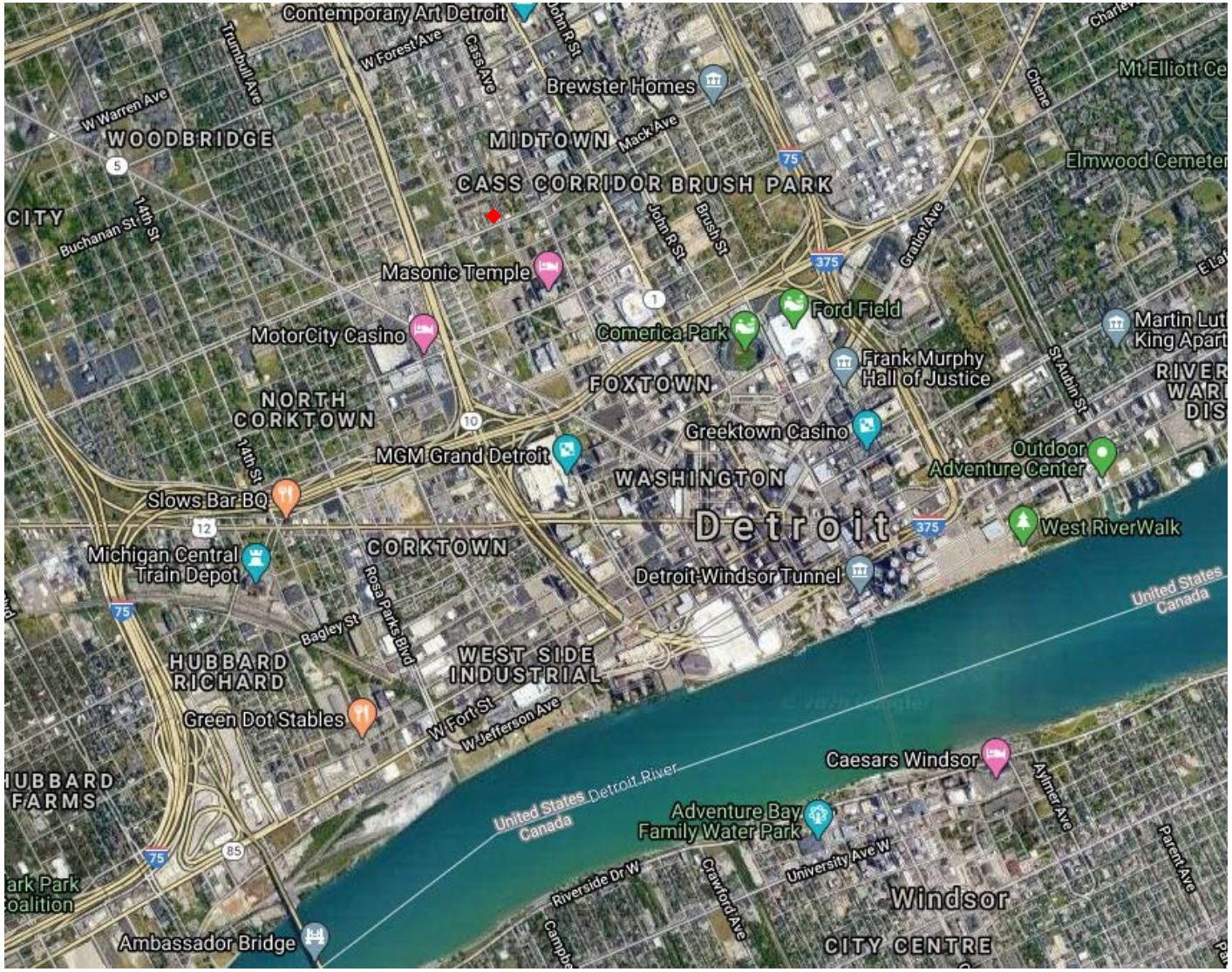
3515 2nd Ave., Detroit, MI

April 6, 2020

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



Legend

- Gas Transmission Pipelines
- Hazardous Liquid Pipelines
- Subject Property

500 m
1000 ft

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms@dot.gov.

Projection: Geographic

Datum: NAD83

Map produced by the Public Viewer application at www.npms.phmsa.dot.gov

Date Printed: Apr 07, 2020

811 Know what's below. Call before you dig.

Noise Assessment
3515 2nd Avenue
Detroit, Michigan

MHT Housing, Inc.

April 1, 2020

ASTI ENVIRONMENTAL

ASTI ENVIRONMENTAL

Noise Assessment
3515 2nd Avenue
Detroit, Michigan

April 1, 2020

Report Prepared For:

MHT Housing, Inc.
32600 Telegraph Road Suite 102
Bingham Farms, Michigan 48025

Report Prepared By:

ASTI Environmental
10448 Citation Drive, Suite 100
Brighton, Michigan 48116
800-395-ASTI

ASTI Project No. 11469

Report Prepared by:

Ashleigh Czapek
Associate I

Report Reviewed by:

Pamela Chapman, PE, EP
Phase I Group Leader

ASTI ENVIRONMENTAL

TABLE OF CONTENTS

1.0 INTRODUCTION

MHT Housing, Inc. proposes a demolition and new construction project utilizing funding provided from the Michigan State Housing Development Authority (MSHDA) at 3515 2nd Avenue, Detroit, Michigan, referred to herein as "Subject Property".

This assessment was conducted to provide the noise level and associated noise category at each designated Noise Assessment Location (NAL) at the Subject Property. This assessment does not include an evaluation of noise attenuation but general guidance is provided at the end of this assessment.

This evaluation was conducted per guidelines set forth in 24 CFR 51B. This noise analysis evaluates the Subject Property's exposure to three major sources of noise: aircraft, roadways, and railways. If identified, additional non-transportation noise sources such as loud impulse sounds from nearby industry are also evaluated.

The following three sources of transportation noise and their applicable search distances are outlined below when evaluating noise at a site.

1. Aircraft - All military and FAA-regulated civil airfields within 15 miles of the Subject Property.
2. Roadways - Major roadways and limited access highways/freeways within 1,000 feet of the Subject Property utilizing a 10-year projection. Roadways considered are generally based on number of lanes, speed limit, presence of stop signs or lights, overall traffic counts, and/or number of medium or heavy trucks.
3. Railroad - All active railroads within 3,000 feet of the Subject Property.

The noise level calculated at a NAL is known as the day-night average sound level or DNL. A calculated DNL can fall within three categories as follow.

1. Acceptable - DNL not exceeding 65 decibels (dB)
2. Normally Unacceptable - DNL above the 65 dB threshold but not exceeding 75 dB
3. Unacceptable - DNL above 75 dB

Two NALs (NAL #1 and NAL #2) were selected on the Subject Property for this analysis based on proximity to noise sources. A map with the Subject Property boundaries and NAL locations is included as Attachment A.

The following is a summary of the applicable noise sources identified at the NALs.

NAL #1

Noise Source with Applicable Distance	**Name**	**Distance to NAL**
Airport(s)	Coleman A Young International Airport	4.6 miles
	Windsor International Airport	6.8 miles
Busy Road(s)	Martin Luther King (MLK) Jr. Blvd	53 feet
	3rd Avenue	540 feet
	Cass Avenue	771 feet
Railroad(s)	None	NA
Non-Transportation	None	NA

NAL #2

Noise Source with Applicable Distance	**Name**	**Distance to NAL**
Airport(s)	Coleman A Young International Airport	4.6 miles
	Windsor International Airport	6.8 miles
Busy Road(s)	Martin Luther King (MLK) Jr. Blvd	53 feet
	3rd Avenue	600 feet
	Cass Avenue	709 feet
Railroad(s)	None	NA
Non-Transportation	None	NA

2.0 EVALUATION OF NOISE SOURCES

2.1 Airports

Coleman A. Young International Airport is approximately 4.6 miles distant. Based on the Noise Contour Map for the airport (Attachment B), the site is not within a distance of concern.

Windsor International Airport is approximately 6.8 miles distant. Based on the Noise Contour Map for the airport (Attachment B), the site is not within a distance of concern.

Other small airfields were identified within 15 miles, but these airfields have no commercial traffic and are not likely FAA-regulated. They are not considered to represent a noise concern.

2.2 Busy Roadways

The major roadways are:

- MLK Jr. Blvd.
- 3rd Avenue
- Cass Avenue

MLK Jr. Blvd. is a 6-lane road and the speed limit is 25 mph near the Subject Property. The roadway is an approximate effective distance of 53 feet from the southwestern corner of the proposed building (NAL #1).

3rd Avenue is a 2-lane road with a center turn lane and the speed limit is 25 mph near the Subject Property. The roadway is an approximate effective distance of 540 feet from the southwestern corner of the proposed building (NAL #1).

Cass Avenue is a 2-lane road and the speed limit is 25 mph near the Subject Property. The roadway is an approximate effective distance of 709 feet from the southeastern corner of the proposed residential building (NAL #2).

Traffic counts for roadways were obtained through MDOT. Projections were done through 2030. A growth rate of 1% per year compounded was judged appropriate as traffic levels are expected to remain relatively stable. Traffic projections are included in Attachment C.

2.3 Railroads

Not applicable.

2.4 Non-Transportation Sources

Not applicable.

3.0 CALCULATIONS

A Noise DNL calculator worksheet for the NALs are provided in Attachment D.

Using the HUD DNL calculator, the noise level at NAL #1, as predicted in 2030, is calculated to be 72.6 dB and within the Normally Unacceptable range.

Using the HUD DNL calculator, the noise level at NAL #2, as predicted in 2030, is calculated to be 72.5 dB and within the Normally Unacceptable range.

4.0 CONCLUSIONS

The following is a summary of the findings of this assessment.

NAL #	Combined Source DNL (dB)	Category
1	72.6	Normally Unacceptable
2	72.5	Normally Unacceptable

5.0 REFERENCES

- 24 CFR Part 51 Subpart B
- The Noise Guidebook, U.S. Department of Housing and Urban Development,
- U.S. DOT
- https://mdot.ms2soft.com/
- https://www.hudexchange.info/programs/environmental-review/dnl-calculator/

HUD ATTENUATION GUIDANCE

https://www.hudexchange.info/programs/environmental-review/noise-abatement-and-control/

All sites whose environmental or community noise exposure exceeds the day night average sound level (DNL) of 65 decibels (dB) are considered noise-impacted areas. For new construction that is proposed in high noise areas, grantees shall incorporate noise attenuation features to the extent required by HUD environmental criteria and standards contained in Subpart B (Noise Abatement and Control) of 24 CFR Part 51. The interior standard is 45 dB.

The "Normally Unacceptable" noise zone includes community noise levels from above 65 dB to 75 dB. Approvals in this noise zone require a minimum of 5 dB additional sound attenuation for buildings having noise-sensitive uses if the day-night average sound level is greater than 65 dB but does not exceed 70 dB, or a minimum of 10 dB of additional sound attenuation if the day-night average sound level is greater than 70 dB but does not exceed 75 dB.

Locations with day-night average noise levels above 75 dB have “Unacceptable” noise exposure. For new construction, noise attenuation measures in these locations require the approval of the Assistant Secretary for Community Planning and Development (for projects reviewed under Part 50) or the Responsible Entity’s Certifying Officer (for projects reviewed under Part 58). The acceptance of such locations normally requires an environmental impact statement.

The environmental review record should contain **one** of the following:

- Documentation the proposed action is not within 1000 feet of a major roadway, 3,000 feet of a railroad, or 15 miles of a military or FAA-regulated civil airfield.
- If within those distances, documentation showing the noise level is *Acceptable* (at or below 65 DNL).
- If within those distances, documentation showing that there’s an effective noise barrier (i.e., that provides sufficient protection).

- Documentation showing the noise generated by the noise source(s) is *Normally Unacceptable (66 – 75 DNL)* and identifying noise attenuation requirements that will bring the interior noise level to 45 DNL and/or exterior noise level to 65 DNL.

ATTACHMENT A

NAL Location Map

Service Layer Credits: World Imagery: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,

3515 2nd Ave

Detroit, MI

0 25 50 100 Feet

N

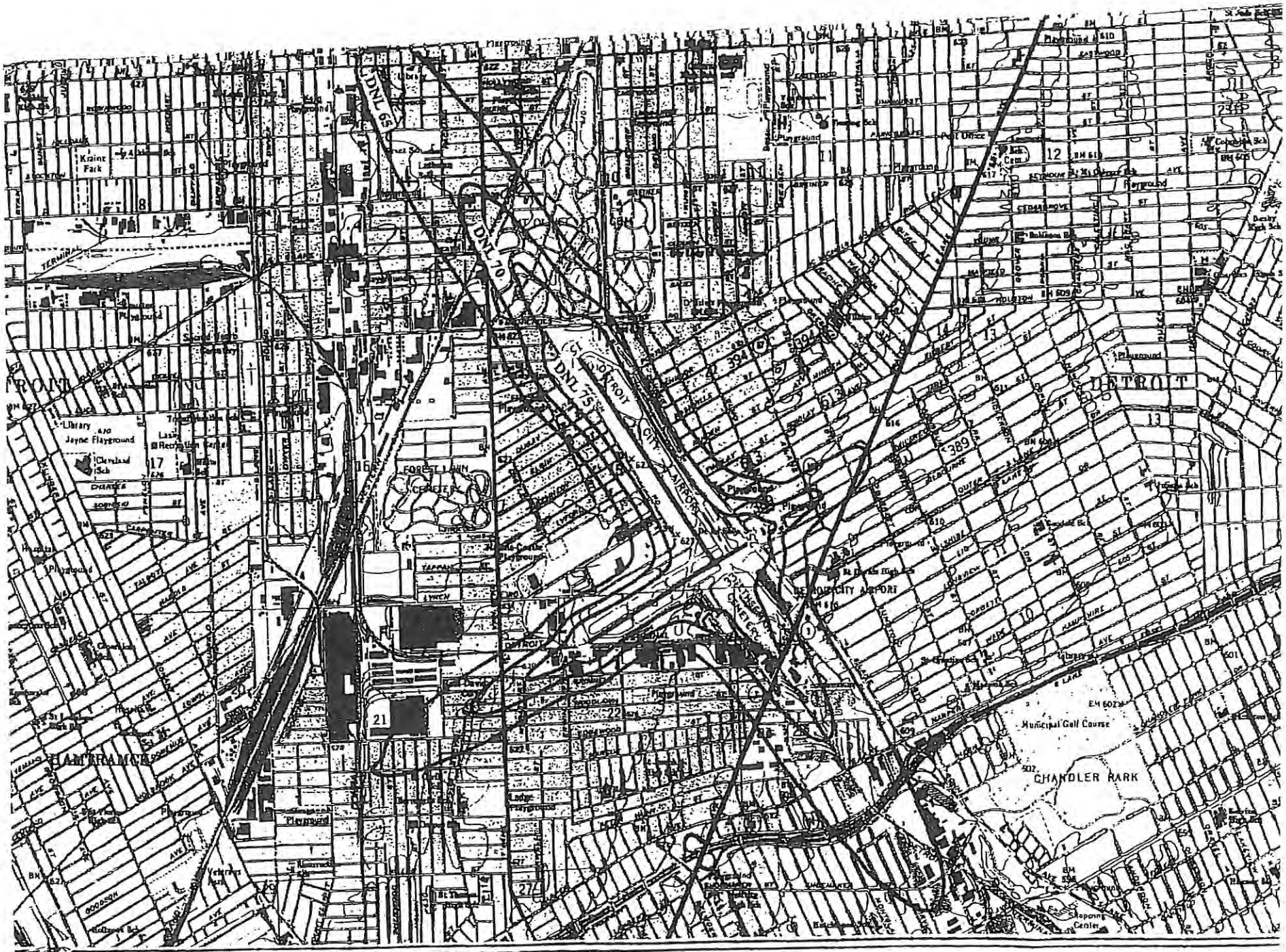
ASTI Environmental

Client: MHT Housing, Inc.
Created by: RMH, April 6, 2020, ASTI Project 11469

Noise Assessment Location Map

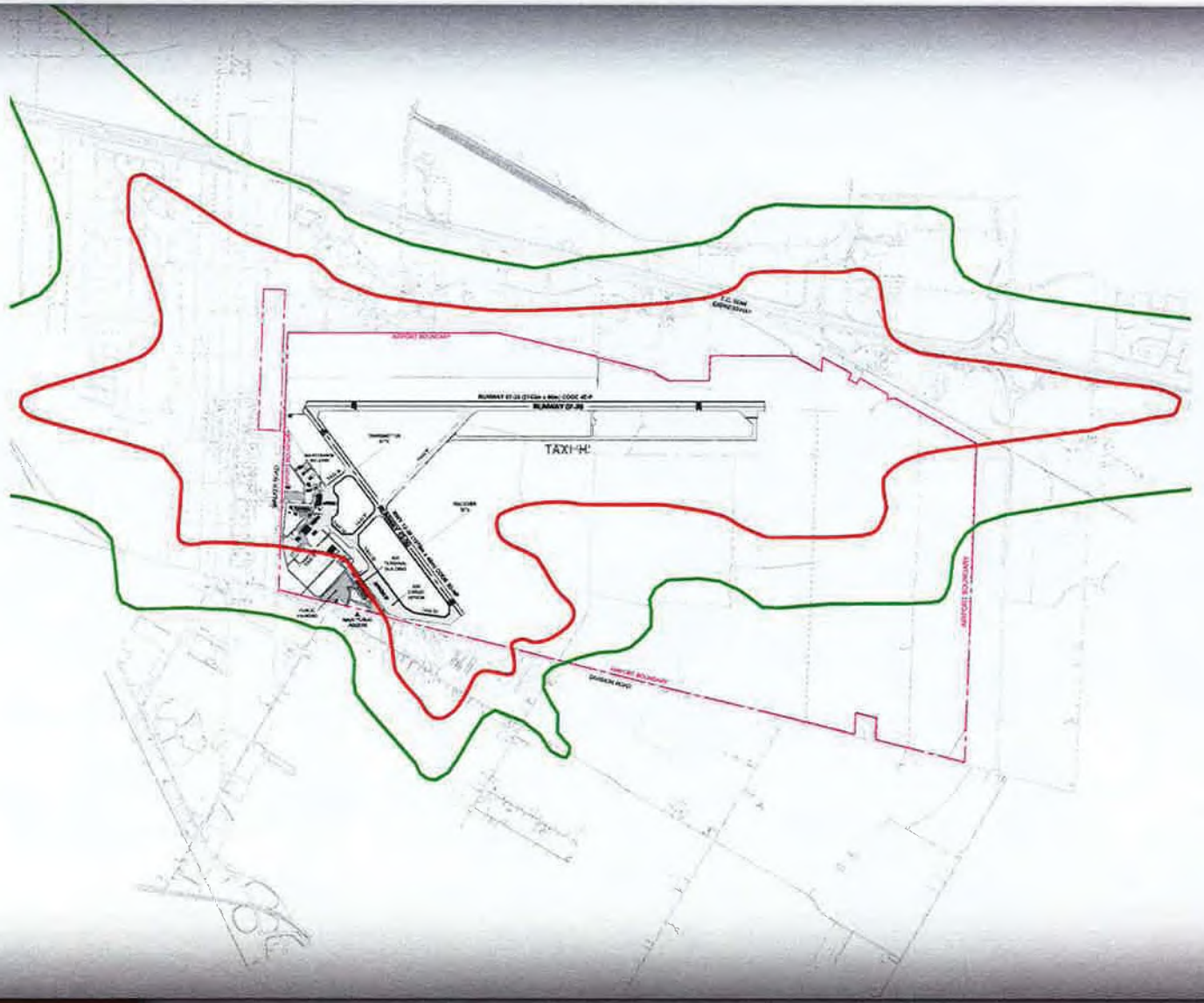
ATTACHMENT B

Airport Noise Contour Maps



CITY OF DETROIT
AIRPORT DEPARTMENT

1996 BASE
NOISE EXPOSURE CONTOURS



WINDSOR AIRPORT
MASTER PLAN

FIGURE 3-4 - AIRPORT NOISE EXPOSURE FORECAST CONTOURS

30 NEF (NOISE EXPOSURE FORECAST)

25 NEF

Notes

1. Conceptual Layout
2. All dimensions approximate
3. Noise Exposure Forecast provided by Windsor Airport Management

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by EDH
Map checked by EGL

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/aTAXI 'H'

Project #: 09-2665
Status: n/a
Date: December 2010

N E W S

ATTACHMENT C

AADT Information

Auto and Heavy Truck 10-year ADT Projections

Martin Luther King Blvd.

	Cars	% Change	Trucks	% Change
2016	11423		993.28	
2017	11891	4.1	1034	4.1
2018	11891	0.0	1034	0.0
2019	11831	-0.5	1028.8	-0.5
	Avg % change:	1.2	Avg % change:	1.20
	Avg % change (Last 5-yr Trend):	1.2	Avg % change (Last 5-yr Trend):	1.20
	% Change/Year Assumption	1	**%/Year Change Assumption**	1

2030 Projections

	Cars	Trucks
2019	11831	1029
2020	11950	1039
2021	12069	1049
2022	12190	1060
2023	12312	1071
2024	12435	1081
2025	12559	1092
2026	12685	1103
2027	12811	1114
2028	12940	1125
2029	13069	1136
2030	13200	1148

Predicted 2030 Auto ADT	Predicted 2030 Truck ADT
13200	1148

Auto and Heavy Truck 10-year ADT Projections

3rd Street

	Cars	% Change	Trucks	% Change
2016	10608		922.4	
2017	11043	4.1	960.24	4.1
2018	11043	0.0	960.24	0.0
2019	10988	-0.5	955.44	-0.5
	% Change/Year Assumption	1	**%/Year Change Assumption**	1

2030 Projections

	Cars	Trucks
2019	10988	955
2020	11097	965
2021	11208	975
2022	11320	984
2023	11434	994
2024	11548	1004
2025	11664	1014
2026	11780	1024
2027	11898	1035
2028	12017	1045
2029	12137	1055
2030	12258	1066

Predicted 2030 Auto ADT	Predicted 2030 Truck ADT
12258	1066

Auto and Heavy Truck 10-year ADT Projections

Cass Ave.

	Cars	% Change	Trucks	% Change
2016	10626		924	
2017	5626	-47.1	489.2	-47.1
2018	5626	0.0	489.2	0.0
2019	5597	-0.5	486.72	-0.5
	% Change/Year Assumption	1	**%/Year Change Assumption**	1

2030 Projections

	Cars	Trucks
2019	5597	487
2020	5653	492
2021	5710	497
2022	5767	501
2023	5825	506
2024	5883	512
2025	5942	517
2026	6001	522
2027	6061	527
2028	6122	532
2029	6183	538
2030	6245	543

Predicted 2030 Auto ADT	Predicted 2030 Truck ADT
6245	543

ATTACHMENT D

Day-Night Level Electronic Assessments

DNL Calculator

WARNING: HUD recommends the use of Microsoft Internet Explorer for performing noise calculations. The HUD Noise Calculator has an error when using Google Chrome unless the cache is cleared before each use of the calculator. HUD is aware of the problem and working to fix it in the programming of the calculator.

The Day/Night Noise Level Calculator is an electronic assessment tool that calculates the Day/Night Noise Level (DNL) from roadway and railway traffic. For more information on using the DNL calculator, view the **Day/Night Noise Level Calculator Electronic Assessment Tool Overview (/programs/environmental-review/daynight-noise-level-electronic-assessment-tool/)**.

Guidelines

- To display the Road and/or Rail DNL calculator(s), click on the "Add Road Source" and/or "Add Rail Source" button(s) below.
- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	11469
Record Date	04/01/2020

User's Name	ASTI NAL 1

Road # 1 Name:	**MLK Jr. Blvd.**

Road #1

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	53	53	53
Distance to Stop Sign			
Average Speed	25	25	25
Average Daily Trips (ADT)	13200	574	574
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	62.2111	58.5945	71.9499
Calculate Road #1 DNL	72.5375	Reset	

Road # 2 Name:	**3rd Ave.**

Road #2

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	540	540	540
Distance to Stop Sign			

Average Speed	25	25	25
Average Daily Trips (ADT)	12258	533	533
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	46.7678	43.1508	56.5063
Calculate Road #2 DNL	57.0939	Reset	

Road # 3 Name: **Cass Ave.**

Road #3

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	771	771	771
Distance to Stop Sign			
Average Speed	25	25	25
Average Daily Trips (ADT)	6245	272	271
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	41.519	37.9094	51.2488
Calculate Road #3 DNL	51.8375	Reset	

Add Road Source | Add Rail Source

Airport Noise Level	
Loud Impulse Sounds?	Yes No
Combined DNL for all Road and Rail sources	**72.6653**
Combined DNL including Airport	**N/A**
Site DNL with Loud Impulse Sound	

Calculate

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location
- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
  - **Contact your Field or Regional Environmental Officer (/programs/environmental-review/hud-environmental-staff-contacts/)**
  - Increase mitigation in the building walls (only effective if no outdoor, noise sensitive areas)
  - Reconfigure the site plan to increase the distance between the noise source and noise-sensitive uses
  - Incorporate natural or man-made barriers. See ***The Noise Guidebook (/resource/313/hud-noise-guidebook/)***
  - Construct noise barrier. See the **Barrier Performance Module (/programs/environmental-review/bpm-calculator/)**

Tools and Guidance

Day/Night Noise Level Assessment Tool User Guide (/resource/3822/day-night-noise-level-assessment-tool-user-guide/)

Day/Night Noise Level Assessment Tool Flowcharts (/resource/3823/day-night-noise-level-assessment-tool-flowcharts/)

DNL Calculator

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Guidelines

- To display the Road and/or Rail DNL calculator(s), click on the "Add Road Source" and/or "Add Rail Source" button(s) below.
- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	11469
Record Date	04/01/2020

User's Name	ASTI NAL 2

Road # 1 Name:	**MLK Jr. Blvd.**

Road #1

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	53	53	53
Distance to Stop Sign			
Average Speed	25	25	25
Average Daily Trips (ADT)	13200	574	574
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	62.2111	58.5945	71.9499
Calculate Road #1 DNL	72.5375	Reset	

Road # 2 Name:	**3rd Ave.**

Road #2

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	600	600	600
Distance to Stop Sign			

Average Speed	25	25	25
Average Daily Trips (ADT)	12258	533	533
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	46.0814	42.4645	55.8199
Calculate Road #2 DNL	56.4075	Reset	

Road # 3 Name: **Cass Ave.**

Road #3

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	709	709	709
Distance to Stop Sign			
Average Speed	25	25	25
Average Daily Trips (ADT)	6245	272	271
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	42.0651	38.4555	51.7949
Calculate Road #3 DNL	52.3836	Reset	

Add Road Source | Add Rail Source

Airport Noise Level	
Loud Impulse Sounds?	Yes No
Combined DNL for all Road and Rail sources	**72.5375**
Combined DNL including Airport	**N/A**
Site DNL with Loud Impulse Sound	

Calculate

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location
- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
  - **Contact your Field or Regional Environmental Officer (/programs/environmental-review/hud-environmental-staff-contacts/)**
  - Increase mitigation in the building walls (only effective if no outdoor, noise sensitive areas)
  - Reconfigure the site plan to increase the distance between the noise source and noise-sensitive uses
  - Incorporate natural or man-made barriers. See ***The Noise Guidebook (/resource/313/hud-noise-guidebook/)***
  - Construct noise barrier. See the **Barrier Performance Module (/programs/environmental-review/bpm-calculator/)**

Tools and Guidance

Day/Night Noise Level Assessment Tool User Guide (/resource/3822/day-night-noise-level-assessment-tool-user-guide/)

Day/Night Noise Level Assessment Tool Flowcharts (/resource/3823/day-night-noise-level-assessment-tool-flowcharts/)

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	1000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	276.57
ASD for Thermal Radiation for Buildings (ASDBPU)	50.28
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

Providing Feedback & Corrections

After using the ASD Assessment Tool following the directions in this User Guide, users are encouraged to provide feedback on how the ASD Assessment Tool may be improved. Users are also encouraged to send comments or corrections for the improvement of the tool.

Please send comments or other input using the **Contact Us (https://www.hudexchange.info/contact-us/)** form.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	13500
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	817.89
ASD for Thermal Radiation for Buildings (ASDBPU)	167.48
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

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Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	2000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	369.16
ASD for Thermal Radiation for Buildings (ASDBPU)	69.27
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

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Please send comments or other input using the **Contact Us (https://www.hudexchange.info/contact-us/)** form.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	20000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	963.41
ASD for Thermal Radiation for Buildings (ASDBPU)	200.85
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

Providing Feedback & Corrections

After using the ASD Assessment Tool following the directions in this User Guide, users are encouraged to provide feedback on how the ASD Assessment Tool may be improved. Users are also encouraged to send comments or corrections for the improvement of the tool.

Please send comments or other input using the **Contact Us (https://www.hudexchange.info/contact-us/)** form.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**

Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	8000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	657.70
ASD for Thermal Radiation for Buildings (ASDBPU)	131.49
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

Providing Feedback & Corrections

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Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**

Acceptable Separation Distance (ASD) Electronic Assessment Tool

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Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	1650
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	340.72
ASD for Thermal Radiation for Buildings (ASDBPU)	63.38
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

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Related Information

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Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	6500
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	603.20
ASD for Thermal Radiation for Buildings (ASDBPU)	119.46
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

Providing Feedback & Corrections

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Please send comments or other input using the **Contact Us (https://www.hudexchange.info/contact-us/)** form.

Related Information

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Acceptable Separation Distance (ASD) Electronic Assessment Tool

The Environmental Planning Division (EPD) has developed an electronic-based assessment tool that calculates the Acceptable Separation Distance (ASD) from stationary hazards. The ASD is the distance from above ground stationary containerized hazards of an explosive or fire prone nature, to where a HUD assisted project can be located. The ASD is consistent with the Department's standards of blast overpressure (0.5 psi-buildings) and thermal radiation (450 BTU/ft^2 - hr - people and 10,000 BTU/ft^2 - hr - buildings). Calculation of the ASD is the first step to assess site suitability for proposed HUD-assisted projects near stationary hazards. Additional guidance on ASDs is available in the Department's guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C, Sitting of HUD-Assisted Projects Near Hazardous Operations Handling Conventional Fuels or Chemicals of an Explosive or Flammable Nature.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the ASD result fields with the mouse.

Acceptable Separation Distance Assessment Tool

Is the container above ground?	**Yes:** ☑ **No:** ☐
Is the container under pressure?	**Yes:** ☐ **No:** ☑
Does the container hold a cryogenic liquified gas?	**Yes:** ☐ **No:** ☐
Is the container diked?	**Yes:** ☐ **No:** ☑
What is the volume (gal) of the container?	6000
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
Calculate Acceptable Separation Distance	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	583.42
ASD for Thermal Radiation for Buildings (ASDBPU)	115.12
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

For mitigation options, please click on the following link: Mitigation Options **(/resource/3846/acceptable-separation-distance-asd-hazard-mitigation-options/)**

Providing Feedback & Corrections

After using the ASD Assessment Tool following the directions in this User Guide, users are encouraged to provide feedback on how the ASD Assessment Tool may be improved. Users are also encouraged to send comments or corrections for the improvement of the tool.

Please send comments or other input using the **Contact Us (https://www.hudexchange.info/contact-us/)** form.

Related Information

- **ASD User Guide (/resource/3839/acceptable-separation-distance-asd-assessment-tool-user-guide/)**

10.8 Qualifications of the Environmental Professional(s): Resume of EP(s) and Additional Staff

Cody H. Garnsey
Project Manager

PROFILE

Certifications
40-Hour OSHA HAZWOPER

Education and Training
Grand Valley State University, Allendale, Michigan, 2017
- B.S. Geology
- Business Administration, Minor

Illinois State University, Normal, Illinois, 2017
- Structural Geology Field Course

Western Michigan University, Kalamazoo, Michigan, 2017
- Graduate Level Geoscience Courses: Introduction to Soils, Surface Water Hydrology

Experience History
Project Manager, Geologist, Property Services Group, ASTI Environmental
Research Assistant, Grand Valley State University, Department of Geology

Professional Background
Mr. Garnsey has conducted work on various environmental projects including Phase I and Phase II Environmental Site Assessments (ESAs), Environmental Transaction Screens, and Environmental Risk Reviews (ERRs). He has experience working with properties that are vacant land, abandoned buildings, apartment complexes, residential, auto stations, gasoline stations, industrial facilities, multi-family housing, and golf courses. Project Management experience include Phase I ESA's, ERRs, Environmental Transaction Screens fieldwork coordination, supervising subcontractors, project budgeting, and report completion. Mr. Garnsey's field experience includes soil boring and temporary well installation, soil , groundwater, and soil gas sample collection, UST removal, laboratory data interpretation, and interpreting soil boring sedimentation and stratigraphy. He has completed numerous Phase I ESA, Environmental Transaction Screens, and Environmental Risk Reviews, and several Phase II ESA site investigations throughout Michigan and the Great Lakes Region for all land type uses.

Years Experience: 4—ASTI ENVIRONMENTAL

PAMELA S. CHAPMAN,
PE Group Leader Phase I ESAs

PROFILE

Education
University of Michigan, B.S.E., Civil Engineering, 1990

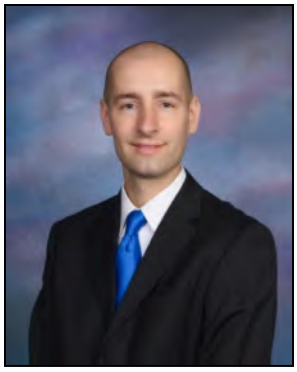
Certifications/Training
Professional Engineer (PE), MI No. 67062
Environmental Professional (AAI)
OSHA 29 CFR 1910.120 HAZWOPER 40-Hour and 8-Hour Refresher (2019)
American Red Cross Adult First Aid and CPR Certified
ASTM Certification in Risk-Based Corrective Action (RBCA) Applied at Petroleum Release Sites
ITRC, Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management
ITRC, Light Non-Aqueous Phase Liquids
EDR ASTM E1527-13 Online Course

Experience History
Group Leader Phase I ESAs, Property Services Group, ASTI Environmental
Project Manager, Inland Seas Engineering, Inc.
Project Manager, Environmental Investigations, Inc.
Project Engineer, Testing Engineers & Consultants, Inc.
Project Engineer, Dell Engineering, Inc.

PROFESSIONAL BACKGROUND

Ms. Chapman specializes in Phase I Environmental Site Assessments (ESAs). She has completed ESAs for residential, commercial, and industrial sites. Work has included vacant land, residential lots, dry cleaners, print shops, landfills, auto garages, gasoline stations, and a former foundry. The property evaluations have included site inspections, historical research, and contact with federal, state, and local agencies. Ms. Chapman also has experience conducting Phase II ESA sampling, preparing Baseline Environmental Assessments, Due Care Plans, Leaking Underground Storage Tank reports, and Part 201 No Further Action reports.

Years Experience: <1 - ASTI ENVIRONMENTAL
26 - OTHER FIRMS/AGENCIES



Anthony LLoyd Spencer, EP

Associate II

PROFILE

Certifications/Training
Environmental Professional (AAI)
40-Hour OSHA HAZWOPER Training
HUD Basic Environmental Training, August 2012

Education and Training
Wayne State University, B.S., Environmental Science, Minor, Geology, May 2011

Experience History
Associate II, Property Service Group, ASTI ENVIRONMENTAL
Research Assistant, Ohio State University, School of Environment and Natural Resources
Research Assistant, Wayne State University, Department of Biology

Professional Background
Mr. Spencer specializes in Phase I environmental site assessments (ESAs). He has completed ESAs for residential, commercial, and industrial sites. He has experience working in Michigan, Ohio, Kentucky, Oklahoma, Pennsylvania, and North Carolina. Work has included vacant land, apartment complexes, residential scattered lots, former plating facilities, print shops, landfills, auto garages, gasoline stations, and schools. The property evaluations have included site inspections, historical research, and contact with federal, state, and local agencies. Mr. Spencer also has experience assisting with Phase II ESA sampling and report preparation, noise assessments, NEPA reporting, HUD narratives, and SHPO consultation.

Mr. Spencer has also conducted tree identification and timber cruising for the U.S. Fish & Wildlife Service in Michigan's Upper Peninsula.

Years Experience:

7 --- ASTI
2 --- other agencies

10.9 MSHDA Phase I Letter of Reliance

SECTION X: 2020 MSHDA PHASE I LETTER OF RELIANCE

(*April 7, 2020*)

PRIVILEGED AND CONFIDENTIAL

Dan Lince
Environmental Manger
Rental Development Division
Michigan State Housing Development Authority
735 East Michigan Avenue
Lansing, Michigan 48912

RE: Phase I ESA for: (*MHT Housing Inc.*), (*11469*), (*April 7, 2020)*

Dear Mr. Lince:

Please find enclosed the Phase I Environmental Site Assessment for the subject property dated *(April 7, 2020)* to the Michigan State Housing Development Authority.

It is my understanding that the information contained in the Phase I Environmental Site Assessment will be used by the Authority in considering proposed financing of residential development of the subject property and, furthermore, that the Authority may rely upon the Phase I Environmental Site Assessment as if it were issued to the Authority.

I **represent** that the attached is a true, correct and complete copy of the Phase I Environmental Site Assessment for the above captioned property and that the report represents my professional opinion of the site as of this date and that I meet the definition of an Environmental Professional as defined in Section 312.10 of 40 CFR 312. I also **represent** that the Phase I Environmental Site Assessment including the evaluation, recommendations, and conclusions as of this date has been performed in conformance with the scope and limitations of the ASTM Practice E 1527-13, ASTM Practice E 2600-15, and MSHDA's Environmental Review Requirements for 2020.

Sincerely,

(*Ms. Pam Chapman, EP, PE)*

10.10 Copy of Environmental Professional Insurance Certificate

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 08/13/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Sandy Watterson	
Daly Merritt Insurance 3099 Biddle Avenue Wyandotte MI 48192	PHONE (A/C, No, Ext): (734) 283-1400	FAX (A/C, No): (734) 283-1197
	E-MAIL ADDRESS: sandy.watterson@dalymerritt.com	

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A :	Illinois Union Insurance Company	27960
INSURER B :	Cincinnati Insurance Co.	10677
INSURER C :	Accident Fund Ins. Co. of Am.	10166
INSURER D :		
INSURER E :		
INSURER F :		

INSURED

Applied Science & Technology Inc.
dba ASTI Environmental
10448 Citation Drive, Suite 100
Brighton MI 48116

COVERAGES **CERTIFICATE NUMBER:** CL198217543 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☒ POLICY ☐ PRO-JECT ☐ LOC ☐ OTHER:			G24038002 012	08/06/2019	08/06/2020	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
B	AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ OWNED AUTOS ONLY ☐ SCHEDULED AUTOS ☒ HIRED AUTOS ONLY ☒ NON-OWNED AUTOS ONLY			EBA0159852	08/06/2019	08/06/2020	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Uninsured motorist	$ 1,000,000 $ $ $ $ 1,000,000
A	☐ UMBRELLA LIAB ☐ OCCUR ☒ EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☐ RETENTION $			G24038014 012	08/06/2019	08/06/2020	EACH OCCURRENCE AGGREGATE	$ 7,000,000 $ 7,000,000
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y / N ☐ If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WCV8009416	08/06/2019	08/06/2020	☒ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
A	Contractors Pollution Professional Liability			G24038002 012	08/06/2019	08/06/2020	Ea Poll Condition/Gen Ag Each Claim/Gen Agg	$1M/$2M $1M/$2M

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Michigan State Housing Development Authority is named as Additional Insured, ATIMA.

CERTIFICATE HOLDER

Michigan State Housing Development Authority
735 East Michigan Avenue
Lansing MI 48909

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

ASTI ENVIRONMENTAL

ENVIRONMENTAL INVESTIGATION, REMEDIATION, COMPLIANCE AND RESTORATION PROJECTS THROUGHOUT THE GREAT LAKES SINCE 1985.

OUR SERVICES INCLUDE:

- **ASBESTOS, LEAD, MOLD, AND RADON ASSESSMENTS**
- **BROWNFIELD/GREYFIELD REDEVELOPMENT ASSISTANCE**
- **DEVELOPMENT INCENTIVES AND GRANT MANAGEMENT**
- **ECOLOGICAL ASSESSMENTS AND RESTORATION**
- **ENVIRONMENTAL ASSESSMENTS AND IMPACT STATEMENTS**
- **ENVIRONMENTAL OPPORTUNITIES ASSESSMENT**
- **GIS MAPPING**
- **HAZARD MITIGATION PLANNING**
- **MINING AND RECLAMATION ASSISTANCE**
- **REMEDIATION IMPLEMENTATION, OPERATION AND MAINTENANCE**
- **PHASE I ESA AND ENVIRONMENTAL DUE DILIGENCE ASSESSMENTS**
- **REGULATORY COMPLIANCE AND PERMITTING**
- **SOIL AND GROUNDWATER ASSESSMENTS**
- **SOIL AND GROUNDWATER REMEDIATION**
- **STORAGE TANK COMPLIANCE AND CLOSURE**
- **THREATENED AND ENDANGERED SPECIES SURVEYS**
- **WATERSHED AND STORMWATER MANAGEMENT PROGRAMS**
- **WETLAND DELINEATION, PERMITTING, MITIGATION AND BANKING**

ASTI ENVIRONMENTAL
Detroit/Grand Rapids/Brighton

Phone: 1-800-395-2784
www.asti-env.com
Email: environmental@asti-env.com

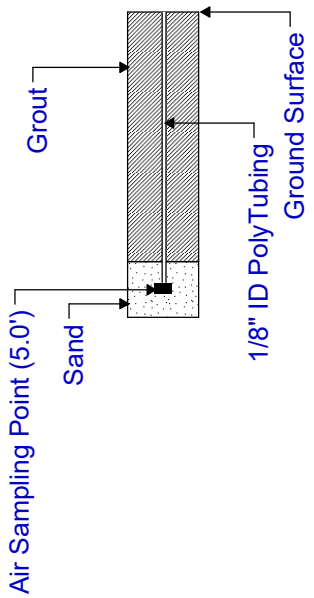
Appendix C

PM ENVIRONMENTAL Environmental & Engineering Services

Soil Gas Log:

Project No.: 01-12411-0-001
Well No.: SB/SG-1
Project Name: Vacant Land
Date Drilled: 8/27/2020
Facility ID#:
Drill Rig: 6712 DT Geoprobe
Logged By: Danielle Wilcox
Sampling Method: Grab

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)		Description and Comments		Blow Counts	PID (ppm)	Soil Gas Well Installed
0		Ground Surface				
		TOPSOIL		-	0.0	
		CL- (Medium Stiff) SANDY CLAY (moist) Brown/Gray, low-plasticity		-	0.0	
2				-	0.0	
				-	0.6	
4				-	1.4	
				-	5.7	
6			SS-1 6.0 - 7.0'	-	13.1	
				-	11.6	
8				-	9.4	
		CL- (Stiff) SANDY CLAY (moist) Brown, medium-plasticity, trace gravel		-	5.8	
10				-	4.9	
				-	4.5	
12				-	1.6	
				-	0.0	
14		***CL- (Medium Stiff) CLAY (moist)*** Gray, medium-plasticity	SS-2 13.5 - 14.5'	-	0.0	
				-	0.0	
16				-	0.0	
				-	0.0	
18				-	0.0	
				-	0.0	
20						



Completion Notes: EOB @ 20' bgs.

1. Boring backfilled with natural soils unless otherwise noted

Boring Log

Project No.: 01-12411-0-001
Boring No.: SB-2
Project Name: Vacant Land
Date Drilled: 8/27/2020
Facility ID#:
Drill Rig: 6712 DT Geoprobe
Logged By: Danielle Wilcox
Sampling Method: Grab

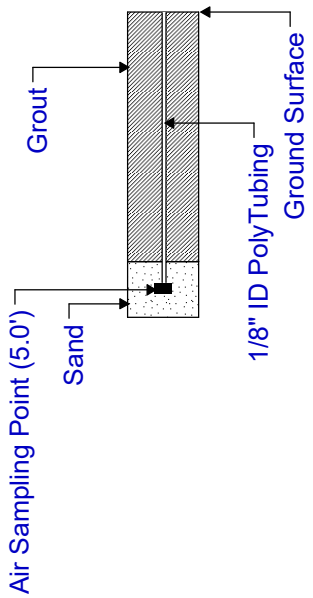
SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)		Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL		-	0.0	
		BRICK DEBRIS		-	0.0	
2		***SC- (Medium Dense) CLAYEY SAND (moist)*** Brown, fine, trace gravel, concrete debris @ 3.5 and 4.5'		-	0.0	
				-	0.0	
4				-	0.9	
		CL- (Medium Soft) SANDY CLAY (moist) Brown/Gray, medium-plasticity, trace gravel	SS-1 5.0 - 6.0'	-	3.5	
6				-	3.0	
				-	2.1	
8				-	1.4	
		CL- (Stiff) SANDY CLAY (moist) Brown, low-plasticity, trace gravel		-	0.9	
10				-	0.0	
				-	0.0	
12				-	0.0	
				-	0.0	
14		***CL- (Medium Stiff) CLAY (moist)*** Gray, medium-plasticity, trace gravel		-	0.0	
				-	0.0	
16				-	0.0	
				-	0.0	
18				-	0.0	
				-	0.0	
20						

Completion Notes: EOB @ 20' bgs.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Soil Gas Log:

Project No.: 01-12411-0-001
Well No.: SB/SG-3
Project Name: Vacant Land
Date Drilled: 8/27/2020
Facility ID#:
Drill Rig: 6712 DT Geoprobe
Logged By: Danielle Wilcox
Sampling Method: Grab

SUBSURFACE PROFILE		SAMPLE			
Depth (ft.)	Description and Comments		Blow Counts	PID (ppm)	Soil Gas Well Installed
0	Ground Surface				
	TOPSOIL		-	0.0	
	SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine, trace gravel, brick debis 0.0-2.0'		-	0.0	
2	***CL- (Stiff) SANDY CLAY (moist)*** Brown/Gray, low-plasticity, trace gravel		-	12.7	
			-	104.5	
4		SS-1 4.0 - 5.0'	-	263.2	
	CL- (Medium Stiff) SANDY CLAY (moist) Brown/Gray, medium-plasticity, trace gravel		-	84.9	
6			-	12.0	
			-	10.4	
8		SS-2 8.0 - 9.0'	-	1.6	
	CL- (Stiff) SANDY CLAY (moist) Brown, low-plasticity, trace gravel		-	0.0	
10			-	0.0	
			-	0.0	
12			-	0.0	
			-	0.0	
14			-	0.0	
			-	0.0	
16			-	0.0	
	CL- (Medium Stiff) CLAY (moist) Brown, low-plasticity, trace gravel		-	0.0	
18			-	0.0	
			-	0.0	
20					

Completion Notes: EOB @ 20' bgs.

1. Boring backfilled with natural soils unless otherwise noted

Boring Log

Project No.: 01-12411-0-001 | **Boring No.:** SB-4

Project Name: Vacant Land | **Date Drilled:** 8/27/2020

Facility ID#: | **Drill Rig:** 6712 DT Geoprobe

Logged By: Danielle Wilcox | **Sampling Method:** Grab

PM ENVIRONMENTAL

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)		Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
0		Ground Surface				
		GRASS/TOPSOIL		-	0.0	
		CL- (Stiff) SANDY CLAY (moist) Brown/Gray, low-plasticity, trace gravel, brick debris 0.0-5.5', 2" sand seam @ 3.5'		-	0.0	
2				-	0.0	
				-	0.0	
4				-	0.0	
			SS-1 5.0 - 6.0'	-	0.0	
6		***CL- (Medium Stiff) SANDY CLAY (moist)*** Brown/Gray, medium-plasticity, trace gravel		-	0.0	
		CL- (Stiff) SANDY CLAY (moist) Brown, low-plasticity, trace gravel		-	0.0	
8				-	0.0	
				-	0.0	
10				-	0.0	
				-	0.0	
12				-	0.0	
				-	0.0	
14		***CL- (Medium Stiff) CLAY (moist)*** Gray, medium-plasticity, trace gravel		-	0.0	
				-	0.0	
16				-	0.0	
				-	0.0	
18				-	0.0	
				-	0.0	
20						

Completion Notes: EOB @ 20' bgs.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Soil Gas Log:

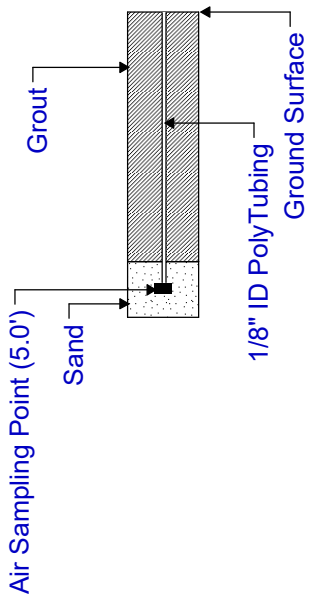
Project No.: 01-12411-0-001 | **Well No.:** SB/SG-5

Project Name: Vacant Land | **Date Drilled:** 8/27/2020

Facility ID#: | **Drill Rig:** 6712 DT Geoprobe

Logged By: Danielle Wilcox | **Sampling Method:** Grab

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)		Description and Comments		Blow Counts	PID (ppm)	Soil Gas Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		-	8.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Dark Gray, fine, trace gravel		-	35.5	
2		***CL- (Stiff) SANDY CLAY (moist)*** Brown/Gray, low-plasticity, trace gravel		-	724.4	
				-	1,112	
4			SS-1 4.0 - 5.0'	-	1,454	
		CL- (Medium Stiff) SANDY CLAY (moist) Brown/Gray, medium-plasticity, trace gravel		-	406.8	
6				-	39.4	
				-	1.8	
8		***CL- (Stiff) SANDY CLAY (moist)*** Brown, medium-plasticity, trace gravel		-	1.0	
				-	0.9	
10				-	0.0	
				-	0.0	
12				-	0.0	
				-	0.0	
14				-	0.0	
				-	0.0	
16				-	0.0	
				-	0.0	
18		***CL- (Medium Soft) CLAY (moist)*** Gray, medium-plasticity, trace gravel		-	0.0	
				-	0.0	
20						



Completion Notes: EOB @ 20' bgs.

1. Boring backfilled with natural soils unless otherwise noted

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-6
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
		Ground Surface				
0		**TOPSOIL/GRASS**		100	23.4	
		SC- (Medium Dense) CLAYEY SAND (moist) Dark Grey, fine, trace gravel		100	45.4	
2		**CL- (Stiff) SANDY CLAY (moist)** Brown/grey, low plasticity, trace gravel		100	852.6	
				100	1,221	
4				100	1,305	
		CL- (Medium Stiff) SANDY CLAY (moist) Brown/grey, medium plasticity, trace gravel		100	392	
6				100	33.9	
		CL- (Stiff) CLAY (moist) Grey, medium plasticity, trace gravel		100	37.4	
8				100	18.4	
				100	16.5	
10			SS-1 10.0 ~ 11.0'	100	6.2	
				100	4.5	
12				100	3.0	
				100	1.2	
14				100	0.0	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-7
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.9	
		SC- (Dense) CLAYEY SAND Brown, fine, trace gravel		100	4.7	
2		***CL- (Medium Stiff) SANDY CLAY (damp)*** Dark grey, low plasticity, trace gravel		100	53.1	
				100	385.2	
4			SS-1 4.0 ~ 5.0'	100	1,061	
				100	152.4	
6				100	123.2	
			SS-2 7.0 ~ 8.0'	100	403.4	
8				100	77.2	
				100	41.8	
10				100	34.0	
				100	11.3	
12		***CL- (Stiff) CLAY (moist)*** Brown, medium plasticity, trace gravel		100	9.78	
				100	3.2	
14			SS-3 14.0 ~ 15.0'	100	0.8	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-8
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.1	
		CL- (Medium Stiff) SANDY CLAY (dry) Brown, low plasticity, trace gravel		100	0.0	
2				100	0.0	
				100	0.0	
4			SS-1 4.0 ~ 5.0'	100	0.0	
				100	0.0	
6		***CL- (Stiff) CLAY (dry)*** Brown, low plasticity, trace gravel		100	0.0	
				100	0.0	
8				100	0.0	
			SS-2 9.0 ~ 10.0'	100	0.0	
10				100	0.0	
				100	0.0	
12				100	0.0	
				100	0.0	
14				100	0.0	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-9
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	6.9	
		CL- (Medium Stiff) SANDY CLAY Dark grey, low plasticity, trace gravel		100	201.5	
2		***CL- (Soft) CLAY (moist)*** Grey, medium plasticity, trace gravel		100	408.7	
				100	315.9	
4		***CL- (Soft) CLAY (moist)*** Grey, medium plasticity, trace gravel/concrete	SS-1 4.0 ~ 5.0'	100	981.4	
				100	331.4	
6				100	84.2	
		CL- (Stiff) CLAY (dry) Grey, low plasticity, trace gravel		100	16.3	
8				100	6.3	
				100	6.2	
10			SS-2 10.0 ~ 11.0'	100	3.9	
				100	2.4	
12				100	1.6	
		CL- (Stiff) CLAY (moist) Brown, low plasticity, trace gravel		100	0.8	
14				100	0.2	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-10
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
		Ground Surface				
0		***TOPSOIL/GRASS***		100	0.0	
		CL- (Medium Stiff) SANDY CLAY (moist) Brown/grey, low plasticity		100	0.0	
2				100	0.0	
				100	0.0	
4				100	0.0	
				100	0.0	
6				100	0.0	
			SS-1 6.5 ~ 7.5'	100	0.0	
		CL- (Stiff) SANDY CLAY (moist) Brown, low plasticity, trace gravel		100	0.0	
8				100	0.0	
				100	0.0	
10				100	0.0	
				100	0.0	
12				100	0.0	
				100	0.0	
14		***CL- (Soft) CLAY (damp)*** Grey, medium plasticity	SS-2 14.0 ~ 15.0'	100	0.0	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-11
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Grey, fine to medium		100	0.0	
2				100	0.1	
			SS-1 3.0 ~ 4.0'	100	0.2	
4		***CL- (Stiff) SANDY CLAY (moist)*** Brown/grey, low plasticity, trace gravel, concrete/brick		100	0.0	
				100	0.0	
6				100	0.0	
		CL- (Medium Stiff) CLAY (damp) Brown, low plasticity, trace gravel		100	0.0	
8				100	0.0	
				100	0.0	
10		***CL- (Medium Stiff) SANDY CLAY (moist)*** Brown/grey, low plasticity, trace gravel	SS-2 10.0 ~ 11.0'	100	0.1	
		CL- (Stiff) CLAY (moist) Brown, medium plasticity, trace gravel		100	0.0	
12				100	0.0	
				100	0.0	
14				100	0.0	
				100	0.0	
16				100	0.0	
				100	0.0	
18				100	0.0	
				100	0.0	
20						

Completion Notes: EOB @ 20'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-12
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.1	
		SC- (Medium Dense) CLAYEY SAND (moist) Grey, fine, trace gravel		100	0.2	
2				100	0.2	
				100	0.3	
4		**CL- (Stiff) CLAY (moist)** Brown, medium plasticity, trace gravel		100	0.5	
				100	0.6	
6			SS-1 6.0 ~ 7.0'	100	1.2	
				100	0.9	
8				100	0.7	
				100	0.6	
10			SS-2 10.0 ~ 11.0'	100	0.5	
				100	0.5	
12				100	0.2	
				100	0.0	
14				100	0.0	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-13
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.0	
		CL- (Medium Stiff) SANDY CLAY Brown, low plasticity		100	0.2	
2		**GP- (Medium Dense) GRAVELLY SAND** Brown, fine to medium, brick/concrete		100	0.7	
				100	1.8	
4			SS-1 4.0 ~ 5.0'	100	3.5	
		GRAVELS/CONCRETE Coarse, no fines				
		LITTLE RECOVERY Concrete		25	4.2	
6				25	5.4	
				25	4.7	
8				25	7.4	
				25	7.3	
10		**CL- (Medium Stiff) CLAY (damp)** Medium plasticity		100	18.9	
			SS-2 11.0 ~ 12.0'	100	21.2	
12				100	14.6	
				100	2.3	
14			SS-3 14.0 ~ 15.0'	100	1.6	
				100	1.2	
16						

Completion Notes: EOB @ 16' Refusal (Suspected Concrete)

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-14
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine to medium, trace gravel		100	0.0	
2				100	0.0	
			SS-1 3.0 ~ 4.0'	100	0.0	
4		***CL- (Medium Stiff) SANDY CLAY (moist)*** Brown, medium plasticity, trace gravel		100	0.0	
				100	0.0	
6		***CL- (Medium Stiff) CLAY (dry)*** Brown, low plasticity, trace gravel		100	0.0	
				100	0.0	
8				100	0.0	
			SS-2 9.0 ~ 10.0'	100	0.0	
10				100	0.0	
				100	0.0	
12				100	0.0	
		CL- (Medium Stiff) CLAY (moist) Grey, medium plasticity		100	0.0	
14				100	0.0	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-15
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.0	
		SC- CLAYEY SAND (moist) Brown, fine to medium, trace gravel		100	0.0	
2				100	10.4	
			SS-1 3.0 ~ 4.0'	100	1,142	
4		***CL- (Stiff) SANDY CLAY (moist)*** Grey, low plasticity, trace gravel		100	1,007	
				100	93.4	
6		***CL- (Medium Stiff) CLAY (moist)*** Grey/brown, low plasticity	SS-2 6.0 ~ 7.0'	100	18.3	
				100	12.5	
8				100	12.4	
				100	10.8	
10		***CL- (Stiff) CLAY (moist)*** Brown, low plasticity		100	4.4	
				100	2.8	
12				100	1.2	
				100	4.2	
14		***CL- (Soft) CLAY (damp)*** Grey, medium plasticity	SS-3 14.0 ~ 15.0'	100	1.9	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-16
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
		Ground Surface				
0		***TOPSOIL/GRASS***		100	0.0	
		SC- (Medium Stiff) CLAYEY SAND Brown, fine to medium		100	0.0	
2				100	0.8	
		CONCRETE		100	354.6	
4		***CL- (Medium Stiff) CLAY (moist)*** Grey, low plasticity, trace gravel	SS-1 4.0 ~ 5.0'	100	728.5	
				100	549	
6				100	12.1	
		CL- (Stiff) CLAY (moist) Brown, low plasticity, trace gravel		100	8.0	
8				100	3.4	
			SS-2 9.0 ~ 10.0'	100	2.1	
10				100	1.8	
				100	1.2	
12				100	0.6	
				100	0.4	
14				100	0.2	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Boring Log .

Project No.: 01-12411-1-001
Project Name: Vacant Land
Address: 3515 2nd Ave, Detroit
Facility ID#:
Date Drilled:
Logged By: Jana Beumel

Boring No.: SB-17
Drill Rig: Geoprobe
Drilling Method: DIRECT
Sampling Method: GRAB
Drilling Contractor: PME

Depth (ft.)	Soil Type Graphic	Description and Comments	Sample Interval	% Recovery	PID (ppm)	No Well Installed
0		Ground Surface				
		TOPSOIL/GRASS		100	0.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine to medium, trace gravel		100	0.1	
2				100	0.1	
		CL- (Medium Stiff) SANDY CLAY (moist) Brown/gray, low plasticity		100	0.1	
4				100	1.4	
		CL- (Soft) CLAY (damp) Grey, medium plasticity				
		CL- (Medium Stiff) CLAY (moist) Grey, low plasticity	SS-1 5.0 ~ 6.0'	100	3.3	
6				100	0.7	
				100	0.0	
8		***CL- (Stiff) CLAY (moist)*** Brown, medium plasticity		100	0.0	
			SS-2 9.0 ~ 10.0'	100	0.0	
10				100	0.0	
				100	0.0	
12				100	0.0	
				100	0.0	
14				100	0.0	
16						

Completion Notes: EOB @ 15'

Legend:

EOB	End of Boring
Bgs.	Below Ground Surface
NR	No Recovery
NA	Not Applicable
Ft.	Feet

Appendix D

PM ENVIRONMENTAL Environmental & Engineering Services

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
WARREN DISTRICT OFFICE

GRETCHEN WHITMER
GOVERNOR

LIESL EICHLER CLARK
DIRECTOR

March 21, 2022

MEMO

DELIVERED VIA ELECTRONIC MAIL 3/21/2022

TO: Jana Beumel, PM Environmental

FROM: Jeanne Schlaufman, EQS
Remediation and Redevelopment Division
Southeast Michigan District

SUBJECT: Request for Site-Specific Criteria for:
MLK on 2nd Avenue
3515 2Nd Avenue, Detroit, Wayne County
Site ID #

The Department of Environment, Great Lakes, and Energy (EGLE) has developed site-specific volatilization to indoor air criteria for the subject site in response to your request received February 15, 2022.

Inserted within the body of this memo are tables that contain site-specific volatilization to indoor air criteria (SSVIAC) under Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended, which represent EGLE's determination of values that reflect best available information regarding the toxicity and exposure risks posed by the hazardous substances present at the property identified as MLK on 2nd Avenue, 3515 2Nd Avenue, Detroit, Wayne County. These values may be used as SSVIAC without further documentation to evaluate the volatilization to indoor air pathway (VIAP). If representative groundwater and soil sampling indicate that site concentrations are below unrestricted residential SSVIAC, there is not a vapor source and there is not a requirement to evaluate the migration of vapors with vapor sampling. Exceedance of unrestricted residential SSVIAC for any media necessitates a representative vapor investigation to evaluate the VIAP. Other values may be developed by a person consistent with the statutory provisions for development of site-specific criteria or screening levels and provided for EGLE review and approval.

Exceedances of these residential SSVIAC will require restrictions or institutional controls for closure or aid in the determination of off-site migration.

The results of this evaluation are as follows:

Table 1. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation and an **elevator shaft that extend 5 feet below grade**, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m^3)
83329	Acenaphthene	3,900 (S) sol	2.0E+05 nc	7,300 nc
208968	Acenaphthylene	65 (CC) nc	DATA	7,300 nc
67641	Acetone	1.6E+07 (EE) st	2.6E+05 (EE) st	1.0E+06 (EE) st
107131	Acrylonitrile	62 ca	1.2 (M) ca	12 ca
994058	t-Amyl methyl ether (TAME)	1,800 nc	34 (M) nc	2,200 nc
120127	Anthracene	43 (S) sol	1.3E+07 nc	35,000 nc
71432	Benzene	17 ca	1.7 (M) ca	110 ca
56553	Benzo(a)anthracene	9.4 (S) (MM) sol	1.6E+05 (MM) mut	5.8 (MM) mut
108861	Bromobenzene	1,600 nc	160 nc	2,100 nc
75274	Bromodichloromethane	29 ca	0.61 (M) ca	48 ca
75252	Bromoform	2,800 ca	45 (M) ca	770 ca
74839	Bromomethane	30 nc	0.90 (M) nc	350 nc
78933	2-Butanone (MEK)	2.0E+06 (DD) dev	31,000 (DD) dev	1.7E+05 (DD) dev
75650	t-Butyl alcohol	1.8E+05 nc	3,200 nc	2,500 nc
104518	n-Butylbenzene	970 nc	550 nc	7,000 nc
135988	sec-Butylbenzene	3,700 nc	3,800 nc	14 nc
98066	t-Butylbenzene	1.6 nc	0.64 (M) nc	14 nc
75150	Carbon disulfide	1,100 nc	52 (M) nc	24,000 nc
56235	Carbon tetrachloride	6.6 ca	0.31 (M) ca	150 ca
108907	Chlorobenzene	660 nc	82 nc	1,700 nc
75003	Chloroethane	8,000 nc	330 nc	1.4E+05 nc
67663	Chloroform	9.2 ca	0.26 (M) ca	37 ca
74873	Chloromethane	180 nc	6.9 (M) nc	3,100 nc
110827	Cyclohexane	1,300 nc	320 (M) nc	2.1E+05 nc

Table 1. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation and an **elevator shaft that extend 5 feet below grade**, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m^3)
124481	Dibromochloromethane	26 (MM) mut	0.40 (MM) (M) mut	14 (MM) mut
96128	Dibromochloropropane	4.5E-04 (MM) (M) (CC) mut	DATA	6.2E-02 (MM) mut
95501	1,2-Dichlorobenzene	9,000 nc	1,500 nc	10,000 nc
541731	1,3-Dichlorobenzene	64 nc	10 (M) nc	100 nc
106467	1,4-Dichlorobenzene	150 ca	23 (M) ca	220 ca
75718	Dichlorodifluoromethane	35 nc	12 (M) nc	11,000 nc
75343	1,1-Dichloroethane	81 ca	2.6 (M) ca	530 ca
107062	1,2-Dichloroethane	25 ca	0.82 (M) ca	33 ca
75354	1,1-Dichloroethylene	200 nc	12 (M) nc	7,000 nc
156592	cis-1,2-Dichloroethylene	58 nc	2.1 (M) nc	280 nc
156605	trans-1,2-Dichloroethylene	240 nc	12 (M) nc	2,800 nc
78875	1,2-Dichloropropane	52 nc	2.1 (M) nc	140 nc
542756	1,3-Dichloropropene	64 (J) ca	3.1 (M) (J) ca	210 (J) ca
60297	Diethyl ether	22,000 nc	350 nc	35,000 nc
108203	Diisopropyl ether	9,700 (DD) dev	190 (M) (DD) dev	23,000 (DD) dev
64175	Ethanol	6.7E+07 (EE) st	1.3E+06 (EE) st	6.3E+05 (EE) st
637923	Ethyl-tert-butyl ether (ETBE)	22 (CC) nc	DATA	13,000 nc
100414	Ethylbenzene	55 ca	12 (M) ca	340 ca
106934	Ethylene dibromide	3.6 ca	7.4E-02 (M) ca	1.4 ca
86737	Fluorene	1,700 (S) sol	4.7E+05 nc	4,900 nc
142825	n-Heptane	150 (GW) nc	130 nc	1.2E+05 nc
67721	Hexachloroethane	58 ca	3.2 (M) ca	85 ca
110543	n-Hexane	29 (GW) nc	25 nc	24,000 nc
591786	2-Hexanone	11,000 nc	210 (M) nc	1,000 nc

Table 1. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation and an **elevator shaft that extend 5 feet below grade**, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m^3)
67630	Isopropyl alcohol	5.3E+05 nc	9,800 nc	7,000 nc
98828	Isopropyl benzene	12 ca	3.8 (M) ca	81 ca
Varies	Mercury (Total)	1.8 nc	22 (M) nc	10 nc
108101	4-Methyl-2-pentanone (MIBK)	2.0E+05 (EE) st	3,300 (EE) st	27,000 (EE) st
1634044	Methyl-tert-butyl ether (MTBE)	4,900 ca	74 (M) ca	3,300 ca
96377	Methylcyclopentane	62 nc	29 (M) nc	24,000 nc
75092	Methylene chloride	4,700 nc	130 nc	21,000 nc
91576	2-Methylnaphthalene	1,600 nc	1,700 nc	350 nc
91203	Naphthalene	92 ca	67 (M) ca	25 ca
109660	Pentane	40 (M) (GW) nc	36 (M) nc	35,000 nc
85018	Phenanthrene	180 nc	1,700 nc	3.5 nc
1336363	Polychlorinated biphenyls (PCBs)	3.1E-02 (M) (CC) (J) ca	DATA	8.5 (J) ca
103651	n-Propylbenzene	5,000 (DD) dev	1,800 (DD) dev	33,000 (DD) dev
129000	Pyrene	140 (S) sol	2.5E+07 nc	3,500 nc
100425	Styrene	680 ca	150 ca	1,500 ca
630206	1,1,1,2-Tetrachloroethane	85 ca	3.2 (M) ca	110 ca
79345	1,1,2,2-Tetrachloroethane	59 ca	2.7 (M) ca	15 ca
127184	Tetrachloroethylene	120 (EE) st	6.2 (M) (EE) st	1,400 (EE) st
109999	Tetrahydrofuran	6.3E+05 nc	13,000 nc	70,000 nc
108883	Toluene	28,000 nc	3,700 nc	1.7E+05 nc
87616	1,2,3-Trichlorobenzene	1,900 nc	830 nc	940 nc
120821	1,2,4-Trichlorobenzene	120 nc	53 (M) nc	70 nc
71556	1,1,1-Trichloroethane	11,000 (EE) st	450 (EE) st	1.7E+05 (EE) st
79005	1,1,2-Trichloroethane	9.9 nc	0.37 (M) nc	7.0 nc

Table 1. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation and an **elevator shaft that extend 5 feet below grade**, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m^3)
79016	Trichloroethylene	7.5 (DD) dev	0.33 (M) (DD) dev	67 (DD) dev
75694	Trichlorofluoromethane	150 nc	19 (M) nc	15,000 nc
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	3,300 nc	860 nc	6.6E+05 nc
540841	2,2,4-Trimethyl pentane	160 (GW) nc	130 (M) nc	1.2E+05 nc
526738	1,2,3-Trimethylbenzene	980 (JT) nc	270 (JT) nc	2,100 (JT) nc
95636	1,2,4-Trimethylbenzene	540 (JT) nc	150 (JT) nc	2,100 (JT) nc
108678	1,3,5-Trimethylbenzene	380 (JT) nc	100 (JT) nc	2,100 (JT) nc
75014	Vinyl chloride	1.1 (MM) mut	8.2E-02 (MM) (M) mut	54 (MM) mut
1330207	Xylenes	1,500 (J) nc	280 (J) nc	7,600 (J) nc
99873	p-Isopropyl toluene	NR	NR	NR

Table 2. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m^3)
83329	Acenaphthene	3,900 (S) sol	2.0E+05 nc	7,300 nc
208968	Acenaphthylene	65 (CC) nc	DATA	7,300 nc
67641	Acetone	1.9E+07 (EE) st	2.6E+05 (EE) st	1.0E+06 (EE) st
107131	Acrylonitrile	73 ca	1.2 (M) ca	12 ca
994058	t-Amyl methyl ether (TAME)	2,100 nc	34 (M) nc	2,200 nc
120127	Anthracene	43 (S) sol	1.3E+07 nc	35,000 nc
71432	Benzene	20 ca	1.7 (M) ca	110 ca
56553	Benzo(a)anthracene	9.4 (S) (MM) sol	1.6E+05 (MM) mut	5.8 (MM) mut
108861	Bromobenzene	1,900 nc	160 nc	2,100 nc
75274	Bromodichloromethane	34 ca	0.61 (M) ca	48 ca
75252	Bromoform	3,500 ca	45 (M) ca	770 ca
74839	Bromomethane	35 nc	0.90 (M) nc	350 nc
78933	2-Butanone (MEK)	2.4E+06 (DD) dev	31,000 (DD) dev	1.7E+05 (DD) dev
75650	t-Butyl alcohol	2.3E+05 nc	3,200 nc	2,500 nc
104518	n-Butylbenzene	1,100 nc	550 nc	7,000 nc
135988	sec-Butylbenzene	5,000 nc	3,800 nc	14 nc
98066	t-Butylbenzene	1.9 nc	0.64 (M) nc	14 nc
75150	Carbon disulfide	1,300 nc	52 (M) nc	24,000 nc
56235	Carbon tetrachloride	7.8 ca	0.31 (M) ca	150 ca
108907	Chlorobenzene	770 nc	82 nc	1,700 nc
75003	Chloroethane	9,300 nc	330 nc	1.4E+05 nc
67663	Chloroform	11 ca	0.26 (M) ca	37 ca
74873	Chloromethane	210 nc	6.9 (M) nc	3,100 nc
110827	Cyclohexane	1,500 nc	320 (M) nc	2.1E+05 nc

Table 2. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m³)
124481	Dibromochloromethane	32 (MM) mut	0.40 (MM) (M) mut	14 (MM) mut
96128	Dibromochloropropane	4.5E-04 (MM) (M) (CC) mut	DATA	6.2E-02 (MM) mut
95501	1,2-Dichlorobenzene	11,000 nc	1,500 nc	10,000 nc
541731	1,3-Dichlorobenzene	76 nc	10 (M) nc	100 nc
106467	1,4-Dichlorobenzene	180 ca	23 (M) ca	220 ca
75718	Dichlorodifluoromethane	41 nc	12 (M) nc	11,000 nc
75343	1,1-Dichloroethane	95 ca	2.6 (M) ca	530 ca
107062	1,2-Dichloroethane	29 ca	0.82 (M) ca	33 ca
75354	1,1-Dichloroethylene	240 nc	12 (M) nc	7,000 nc
156592	cis-1,2-Dichloroethylene	67 nc	2.1 (M) nc	280 nc
156605	trans-1,2-Dichloroethylene	280 nc	12 (M) nc	2,800 nc
78875	1,2-Dichloropropane	61 nc	2.1 (M) nc	140 nc
542756	1,3-Dichloropropene	75 (J) ca	3.1 (M) (J) ca	210 (J) ca
60297	Diethyl ether	26,000 nc	350 nc	35,000 nc
108203	Diisopropyl ether	11,000 (DD) dev	190 (M) (DD) dev	23,000 (DD) dev
64175	Ethanol	8.3E+07 (EE) st	1.3E+06 (EE) st	6.3E+05 (EE) st
637923	Ethyl-tert-butyl ether (ETBE)	22 (CC) nc	DATA	13,000 nc
100414	Ethylbenzene	64 ca	12 (M) ca	340 ca
106934	Ethylene dibromide	4.4 ca	7.4E-02 (M) ca	1.4 ca
86737	Fluorene	1,700 (S) sol	4.7E+05 nc	4,900 nc
142825	n-Heptane	150 (GW) nc	130 nc	1.2E+05 nc
67721	Hexachloroethane	70 ca	3.2 (M) ca	85 ca
110543	n-Hexane	29 (GW) nc	25 nc	24,000 nc
591786	2-Hexanone	14,000 nc	210 (M) nc	1,000 nc

Table 2. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m^3)
67630	Isopropyl alcohol	6.7E+05 nc	9,800 nc	7,000 nc
98828	Isopropyl benzene	15 ca	3.8 (M) ca	81 ca
Varies	Mercury (Total)	2.1 nc	22 (M) nc	10 nc
108101	4-Methyl-2-pentanone (MIBK)	2.4E+05 (EE) st	3,300 (EE) st	27,000 (EE) st
1634044	Methyl-tert-butyl ether (MTBE)	5,800 ca	74 (M) ca	3,300 ca
96377	Methylcyclopentane	73 nc	29 (M) nc	24,000 nc
75092	Methylene chloride	5,400 nc	130 nc	21,000 nc
91576	2-Methylnaphthalene	1,900 nc	1,700 nc	350 nc
91203	Naphthalene	110 ca	67 (M) ca	25 ca
109660	Pentane	40 (M) (GW) nc	36 (M) nc	35,000 nc
85018	Phenanthrene	250 nc	1,700 nc	3.5 nc
1336363	Polychlorinated biphenyls (PCBs)	3.1E-02 (M) (CC) (J) ca	DATA	8.5 (J) ca
103651	n-Propylbenzene	5,900 (DD) dev	1,800 (DD) dev	33,000 (DD) dev
129000	Pyrene	140 (S) sol	2.5E+07 nc	3,500 nc
100425	Styrene	800 ca	150 ca	1,500 ca
630206	1,1,1,2-Tetrachloroethane	100 ca	3.2 (M) ca	110 ca
79345	1,1,2,2-Tetrachloroethane	72 ca	2.7 (M) ca	15 ca
127184	Tetrachloroethylene	140 (EE) st	6.2 (M) (EE) st	1,400 (EE) st
109999	Tetrahydrofuran	7.6E+05 nc	13,000 nc	70,000 nc
108883	Toluene	32,000 nc	3,700 nc	1.7E+05 nc
87616	1,2,3-Trichlorobenzene	2,300 nc	830 nc	940 nc
120821	1,2,4-Trichlorobenzene	150 nc	53 (M) nc	70 nc
71556	1,1,1-Trichloroethane	12,000 (EE) st	450 (EE) st	1.7E+05 (EE) st
79005	1,1,2-Trichloroethane	12 nc	0.37 (M) nc	7.0 nc

Table 2. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement** foundation, the depth to groundwater submitted for this site (i.e. 20 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Shallow Groundwater (µg/L)	Soil (µg/kg)	Soil Vapor** (µg/m^3)
79016	Trichloroethylene	8.8 (DD) dev	0.33 (M) (DD) dev	67 (DD) dev
75694	Trichlorofluoromethane	170 nc	19 (M) nc	15,000 nc
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	3,900 nc	860 nc	6.6E+05 nc
540841	2,2,4-Trimethyl pentane	160 (GW) nc	130 (M) nc	1.2E+05 nc
526738	1,2,3-Trimethylbenzene	1,200 (JT) nc	270 (JT) nc	2,100 (JT) nc
95636	1,2,4-Trimethylbenzene	640 (JT) nc	150 (JT) nc	2,100 (JT) nc
108678	1,3,5-Trimethylbenzene	450 (JT) nc	100 (JT) nc	2,100 (JT) nc
75014	Vinyl chloride	1.3 (MM) mut	8.2E-02 (MM) (M) mut	54 (MM) mut
1330207	Xylenes	1,700 (J) nc	280 (J) nc	7,600 (J) nc
99873	p-Isopropyl toluene	NR	NR	NR

FOOTNOTES

**Soil vapor site-specific volatilization to indoor air criteria (SSVIAC) are applicable for all depths.

- Acceptable Air Values (AAV) endpoint basis used for SSVIAC: (**ca**) = Carcinogenetic; (**nc**) = Non-Carcinogenetic; (**dev**) = Developmental; (**mut**) = Mutagenic cancer; (**st**) = Short-term (i.e., less than chronic exposure).
- Footnote (**#**): Acceptable air concentrations (AAC) cannot be adjusted to a 12-hour exposure time for hazardous substance.
- Footnote **AA**: Health-based groundwater SSVIAC are not available due to insufficient toxicological data. Dissolved-phase methane in groundwater is not explosive; however, if liberated and allowed to accumulate in an enclosed structure the principle health and safety concerns are explosive, flammable, and asphyxiant properties of gas phase methane. The acceptable groundwater concentration is the flammability and explosivity screening level (**FESL**) of 10,000 µg/L.
- Footnote **C**: The health-based SSVIAC exceeds the chemical-specific soil saturation screening level (**Csat**). Because this table does not list Csat values both were provided, with the calculated (health-based) value listed first and Csat provided in parenthesis. The person proposing or implementing response activity must document whether additional response activity is required to control non aqueous phase liquid (**NAPL**) to protect against risks associated with NAPL by using methods appropriate for the NAPL present.
- Footnote **CC**: Insufficient chemical-physical input parameters have been identified to allow the development of a health-based SSVIAC using standard methods. The health based SSVIAC for groundwater is developed based solely on the approach that the department uses for shallow groundwater. If groundwater detections are present, soil vapor may be the most appropriate media to evaluate risk posed from the VIAP.
- Footnote **DATA**: Insufficient physical chemical parameters to calculate a health based SSVIAC for specified media. If detections are present in specified media, health-based soil vapor SSVIAC should be used to evaluate risk.
- Footnote **DD**: Hazardous substance causes developmental effects. Residential SSVIAC are protective of both prenatal exposure using a pregnant female receptor and postnatal exposure using a child receptor. Nonresidential SSVIAC are protective of prenatal exposure using a pregnant female receptor. Prenatal developmental effects may occur after an acute (i.e. short-term) or full-term exposure.
- Footnote **EE**: The acceptable air concentration (**AAC**) for the volatile hazardous substances is not derived using standard methods. The hazardous substance may cause adverse human health effects for less than chronic exposures (i.e. short-term or acute). The AAC for these hazardous substances is the acute or intermediate minimum risk level (MRL) developed by the Agency for Toxic Substances and Disease Registry (ATSDR), a United States Environmental Protection Agency Integrated Risk Information System (IRIS) acute reference concentration, or EGLE's Air Quality Division acute initial threshold screening level (ITSL).
- Footnote **FF**: The AAC for the volatile hazardous substances are based on toxicity values that have been identified to have the potential to cause adverse human health effects for less than chronic exposures (i.e. short-term or acute). The short-term exposure for shallow groundwater health based SSVIAC are based on modification of the standard methods by the department to develop applicable shallow groundwater values.
- Footnote **GG**: Health-based SSVIAC for soil vapor are not available due to insufficient toxicological data. The soil vapor value addresses the health and safety concerns of explosive, flammable, and asphyxiant properties of gas phase methane. The acceptable soil vapor concentration is derived based on 25% of the lower explosive level (**LEL**) for methane.
- Footnote **GW**: The calculated health based SSVIAC for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.
- Footnote **ID**: Requires further evaluation to determine the appropriate media to sample.
- Footnote **J**: Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to criteria.
- Footnote **JT**: Hazardous substance may be present in several isomer forms. The health-based SSVIAC may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive health-based SSVIAC of the detected isomers.
- Footnote **M**: The health based SSVIAC may be below target detection limits (**TDL**). In accordance with Sec. 20120a(10) when the TDL for a hazardous substance is greater than the developed health-based SSVIAC, the TDL is used to evaluate the risk posed from the pathway.
- Footnote **MM**: Hazardous substance is a carcinogen with a mutagenic mode of action. The cancer potency values used in calculating health-based SSVIAC are modified using age-dependent adjustment factors for those carcinogenic chemicals identified as mutagenic.
- Footnote **NA**: The hazardous substance does not meet the department's definition of a volatile; therefore, no health based SSVIAC were developed.
- Footnote **NR**: The hazardous substance has not been previously evaluated by the Remediation and Redevelopment Division Toxicology Unit. The identification, collection, and evaluation of toxicological literature and chemical-physical data cannot be completed within the timeframe requested.
- Footnote **S**: Calculated health-based SSVIAC exceeds the hazardous substance-specific water solubility limit; therefore, the water solubility limit is used to evaluate the risk posed from the pathway. When this occurs the basis for the screening level is noted as "sol".
- Footnote **TX**: The Remediation and Redevelopment Division Toxicology Unit has not identified an inhalation toxicity value for the hazardous substance.

Appendix E

PM ENVIRONMENTAL Environmental & Engineering Services

Analytical Laboratory Report

Report ID: S16969.01(01)
Generated on 09/02/2020

Report to

Attention: Jana Beumel
PM Environmental, Inc.
4080 W. Eleven Mile
Berkley, MI 48072

Phone: O:248-336-9988 D:248-414-1859 FAX:
Email: Beumel@pmenv.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S16969.01-S16969.08
Project: 01-12411-0-0001
Collected Date(s): 08/27/2020
Submitted Date/Time: 08/27/2020 15:00
Sampled by: Danielle Wilcox
P.O. #: 01-12411-0-0001

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM2540B	Standard Method 2540 B 2011
SW3050B	SW 846 Method 3050B Revision 2 December 1996
SW3546	SW 846 Method 3546 Revision 0 February 2007
SW5035A	SW 846 Method 5035A Revision 1 July 2002
SW5035A/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5035A Revision 1 July 2002
SW6020A	SW 846 Method 6020A Revision 1 February 2007
SW8082A	SW 846 Method 8082A Revision 1 February 2007
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (8 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S16969.01	SB-1 6-7'	Soil	08/27/20 09:06
S16969.02	SB-1 13.5-14.5'	Soil	08/27/20 09:11
S16969.03	SB-2 5-6'	Soil	08/27/20 09:40
S16969.04	SB-3 4-5'	Soil	08/27/20 10:44
S16969.05	SB-3 8-9'	Soil	08/27/20 10:49
S16969.06	SB-4 5-6'	Soil	08/27/20 11:23
S16969.07	SB-5 4-5'	Soil	08/27/20 10:10
S16969.08	SB-5 7.5-8.5'	Soil	08/27/20 10:15

Analytical Laboratory Report

Lab Sample ID: S16969.01
Sample Tag: SB-1 6-7'
Collected Date/Time: 08/27/2020 09:06
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	08/31/20 14:15	JRH	
Extraction, PCB*	Completed	SW3546	08/27/20 16:00	CM	
PNA Extraction*	Completed	SW3546	08/27/20 22:54	PTW	
Sample wt. (g) / Methanol (ml)*	19.528/19	SW5035A	08/31/20 14:21	JML	

Inorganics

Method: SM2540B, Run Date: 08/28/20 09:47, Analyst: BML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	81	1		%	1		

Metals

Method: SW6020A, Run Date: 08/31/20 14:48, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Cadmium	Not detected	0.20		mg/kg	240	7440-43-9	
Chromium	10.9	0.50		mg/kg	240	7440-47-3	
Lead	10.9	0.30		mg/kg	240	7439-92-1	

Organics - PCBs/Pesticides

PCB List, Method: SW8082A, Run Date: 08/28/20 14:06, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	1	12674-11-2	
PCB-1242	Not detected	330		ug/kg	1	53469-21-9	
PCB-1221	Not detected	330		ug/kg	1	11104-28-2	
PCB-1232	Not detected	330		ug/kg	1	11141-16-5	
PCB-1248	Not detected	330		ug/kg	1	12672-29-6	
PCB-1254	Not detected	330		ug/kg	1	11097-69-1	
PCB-1260	Not detected	330		ug/kg	1	11096-82-5	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 00:07, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	10	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	10	208-96-8	
Anthracene	Not detected	300		ug/kg	10	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	10	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	10	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	10	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	10	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	10	191-24-2	
Chrysene	Not detected	300		ug/kg	10	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	10	53-70-3	

Lab Sample ID: S16969.01 (continued)
Sample Tag: SB-1 6-7'

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 00:07, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoranthene	Not detected	300		ug/kg	10	206-44-0	
Fluorene	Not detected	300		ug/kg	10	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	10	193-39-5	
Naphthalene	Not detected	300		ug/kg	10	91-20-3	
Phenanthrene	400	300		ug/kg	10	85-01-8	
Pyrene	Not detected	300		ug/kg	10	129-00-0	
2-Methylnaphthalene	700	300		ug/kg	10	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/01/20 16:29, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	71.8	60-29-7	
Acetone	Not detected	1,000		ug/kg	71.8	67-64-1	
Methyl iodide	Not detected	100		ug/kg	71.8	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	71.8	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	71.8	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	71.8	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	71.8	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	71.8	75-71-8	
Chloromethane	Not detected	400		ug/kg	71.8	74-87-3	
Vinyl chloride	Not detected	70		ug/kg	71.8	75-01-4	
Bromomethane	Not detected	300		ug/kg	71.8	74-83-9	
Chloroethane	Not detected	400		ug/kg	71.8	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	71.8	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	71.8	75-35-4	
Methylene chloride	Not detected	100		ug/kg	71.8	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	71.8	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	71.8	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	71.8	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	71.8	109-99-9	
Chloroform	Not detected	70		ug/kg	71.8	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	71.8	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	71.8	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	71.8	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	71.8	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	71.8	56-23-5	
Benzene	Not detected	70		ug/kg	71.8	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	71.8	107-06-2	
Trichloroethene	Not detected	70		ug/kg	71.8	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	71.8	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	71.8	75-27-4	
Dibromomethane	Not detected	400		ug/kg	71.8	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	71.8	10061-01-5	
Toluene	Not detected	70		ug/kg	71.8	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	71.8	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	71.8	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	71.8	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	71.8	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	71.8	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	71.8	106-93-4	M

M-Result reported to MDL not RDL

Lab Sample ID: S16969.01 (continued)
Sample Tag: SB-1 6-7'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/01/20 16:29, Analyst: JML (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorobenzene	Not detected	70		ug/kg	71.8	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	71.8	630-20-6	
Ethylbenzene	260	70		ug/kg	71.8	100-41-4	
p,m-Xylene	2,000	100		ug/kg	71.8		
o-Xylene	840	70		ug/kg	71.8	95-47-6	
Styrene	Not detected	70		ug/kg	71.8	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	71.8	98-82-8	
Bromoform	Not detected	100		ug/kg	71.8	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	71.8	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	71.8	96-18-4	
n-Propylbenzene	230	70		ug/kg	71.8	103-65-1	
Bromobenzene	Not detected	100		ug/kg	71.8	108-86-1	
1,3,5-Trimethylbenzene	630	70		ug/kg	71.8	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	71.8	98-06-6	
1,2,4-Trimethylbenzene	3,190	70		ug/kg	71.8	95-63-6	
sec-Butylbenzene	200	70		ug/kg	71.8	135-98-8	
p-Isopropyltoluene	200	100		ug/kg	71.8	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	71.8	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	71.8	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	71.8	95-50-1	
1,2,3-Trimethylbenzene	1,610	70		ug/kg	71.8	526-73-8	
n-Butylbenzene	520	70		ug/kg	71.8	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	71.8	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	71.8	96-12-8	
1,2,4-Trichlorobenzene	Not detected	470		ug/kg	71.8	120-82-1	
1,2,3-Trichlorobenzene	Not detected	470		ug/kg	71.8	87-61-6	
Naphthalene	700	400		ug/kg	71.8	91-20-3	
2-Methylnaphthalene	7,100	100		ug/kg	71.8	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S16969.02
Sample Tag: SB-1 13.5-14.5'
Collected Date/Time: 08/27/2020 09:11
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	08/31/20 14:15	JRH	
Extraction, PCB*	Completed	SW3546	08/27/20 16:00	CM	
PNA Extraction*	Completed	SW3546	08/27/20 22:54	PTW	
Sample wt. (g) / Methanol (ml)*	17.485/17	SW5035A	08/31/20 14:21	JML	

Inorganics

Method: SM2540B, Run Date: 08/28/20 09:47, Analyst: BML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	85	1		%	1		

Metals

Method: SW6020A, Run Date: 08/31/20 14:50, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Cadmium	Not detected	0.20		mg/kg	245	7440-43-9	
Chromium	17.1	0.50		mg/kg	245	7440-47-3	
Lead	6.98	0.30		mg/kg	245	7439-92-1	

Organics - PCBs/Pesticides

PCB List, Method: SW8082A, Run Date: 08/28/20 14:19, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	1	12674-11-2	
PCB-1242	Not detected	330		ug/kg	1	53469-21-9	
PCB-1221	Not detected	330		ug/kg	1	11104-28-2	
PCB-1232	Not detected	330		ug/kg	1	11141-16-5	
PCB-1248	Not detected	330		ug/kg	1	12672-29-6	
PCB-1254	Not detected	330		ug/kg	1	11097-69-1	
PCB-1260	Not detected	330		ug/kg	1	11096-82-5	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 00:29, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	10	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	10	208-96-8	
Anthracene	Not detected	300		ug/kg	10	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	10	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	10	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	10	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	10	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	10	191-24-2	
Chrysene	Not detected	300		ug/kg	10	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	10	53-70-3	

Lab Sample ID: S16969.02 (continued)
Sample Tag: SB-1 13.5-14.5'

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 00:29, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoranthene	Not detected	300		ug/kg	10	206-44-0	
Fluorene	Not detected	300		ug/kg	10	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	10	193-39-5	
Naphthalene	Not detected	300		ug/kg	10	91-20-3	
Phenanthrene	Not detected	300		ug/kg	10	85-01-8	
Pyrene	Not detected	300		ug/kg	10	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	10	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/02/20 14:40, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	66	60-29-7	
Acetone	Not detected	1,000		ug/kg	66	67-64-1	
Methyl iodide	Not detected	100		ug/kg	66	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	66	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	66	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	66	107-13-1	
2-Butanone (MEK)	Not detected	990		ug/kg	66	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	66	75-71-8	
Chloromethane	Not detected	300		ug/kg	66	74-87-3	
Vinyl chloride	Not detected	70		ug/kg	66	75-01-4	
Bromomethane	Not detected	300		ug/kg	66	74-83-9	
Chloroethane	Not detected	300		ug/kg	66	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	66	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	66	75-35-4	
Methylene chloride	Not detected	100		ug/kg	66	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	66	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	66	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	66	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	66	109-99-9	
Chloroform	Not detected	70		ug/kg	66	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	66	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	66	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	66	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	66	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	66	56-23-5	
Benzene	Not detected	70		ug/kg	66	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	66	107-06-2	
Trichloroethene	Not detected	70		ug/kg	66	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	66	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	66	75-27-4	
Dibromomethane	Not detected	300		ug/kg	66	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	66	10061-01-5	
Toluene	Not detected	70		ug/kg	66	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	66	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	66	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	66	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	66	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	66	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	66	106-93-4	M

M-Result reported to MDL not RDL

Lab Sample ID: S16969.02 (continued)
Sample Tag: SB-1 13.5-14.5'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/02/20 14:40, Analyst: JML (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorobenzene	Not detected	70		ug/kg	66	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	66	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	66	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	66		
o-Xylene	Not detected	70		ug/kg	66	95-47-6	
Styrene	Not detected	70		ug/kg	66	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	66	98-82-8	
Bromoform	Not detected	100		ug/kg	66	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	66	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	66	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	66	103-65-1	
Bromobenzene	Not detected	100		ug/kg	66	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	66	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	66	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	66	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	66	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	66	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	66	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	66	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	66	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	66	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	66	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	66	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	66	96-12-8	
1,2,4-Trichlorobenzene	Not detected	440		ug/kg	66	120-82-1	
1,2,3-Trichlorobenzene	Not detected	440		ug/kg	66	87-61-6	
Naphthalene	Not detected	300		ug/kg	66	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	66	91-57-6	

Lab Sample ID: S16969.03
Sample Tag: SB-2 5-6'
Collected Date/Time: 08/27/2020 09:40
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	08/31/20 14:15	JRH	
Extraction, PCB*	Completed	SW3546	08/27/20 16:00	CM	
PNA Extraction*	Completed	SW3546	08/27/20 22:54	PTW	
Sample wt. (g) / Methanol (ml)*	16.691/16	SW5035A	08/31/20 14:21	JML	

Inorganics

Method: SM2540B, Run Date: 08/28/20 09:47, Analyst: BML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	80	1		%	1		

Metals

Method: SW6020A, Run Date: 08/31/20 14:51, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Cadmium	0.20	0.20		mg/kg	251	7440-43-9	
Chromium	10.8	0.50		mg/kg	251	7440-47-3	
Lead	7.29	0.30		mg/kg	251	7439-92-1	

Organics - PCBs/Pesticides

PCB List, Method: SW8082A, Run Date: 08/28/20 14:31, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	1	12674-11-2	
PCB-1242	Not detected	330		ug/kg	1	53469-21-9	
PCB-1221	Not detected	330		ug/kg	1	11104-28-2	
PCB-1232	Not detected	330		ug/kg	1	11141-16-5	
PCB-1248	Not detected	330		ug/kg	1	12672-29-6	
PCB-1254	Not detected	330		ug/kg	1	11097-69-1	
PCB-1260	Not detected	330		ug/kg	1	11096-82-5	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 00:52, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	10	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	10	208-96-8	
Anthracene	Not detected	300		ug/kg	10	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	10	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	10	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	10	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	10	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	10	191-24-2	
Chrysene	Not detected	300		ug/kg	10	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	10	53-70-3	

Lab Sample ID: S16969.03 (continued)
Sample Tag: SB-2 5-6'

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 00:52, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoranthene	Not detected	300		ug/kg	10	206-44-0	
Fluorene	Not detected	300		ug/kg	10	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	10	193-39-5	
Naphthalene	Not detected	300		ug/kg	10	91-20-3	
Phenanthrene	Not detected	300		ug/kg	10	85-01-8	
Pyrene	Not detected	300		ug/kg	10	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	10	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/02/20 14:59, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	72.4	60-29-7	
Acetone	Not detected	1,000		ug/kg	72.4	67-64-1	
Methyl iodide	Not detected	100		ug/kg	72.4	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	72.4	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	72.4	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	72.4	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	72.4	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	72.4	75-71-8	
Chloromethane	Not detected	400		ug/kg	72.4	74-87-3	
Vinyl chloride	Not detected	70		ug/kg	72.4	75-01-4	
Bromomethane	Not detected	300		ug/kg	72.4	74-83-9	
Chloroethane	Not detected	400		ug/kg	72.4	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	72.4	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	72.4	75-35-4	
Methylene chloride	Not detected	100		ug/kg	72.4	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	72.4	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	72.4	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	72.4	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	72.4	109-99-9	
Chloroform	Not detected	70		ug/kg	72.4	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	72.4	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	72.4	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	72.4	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	72.4	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	72.4	56-23-5	
Benzene	Not detected	70		ug/kg	72.4	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	72.4	107-06-2	
Trichloroethene	Not detected	70		ug/kg	72.4	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	72.4	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	72.4	75-27-4	
Dibromomethane	Not detected	400		ug/kg	72.4	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	72.4	10061-01-5	
Toluene	Not detected	70		ug/kg	72.4	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	72.4	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	72.4	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	72.4	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	72.4	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	72.4	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	72.4	106-93-4	M

M-Result reported to MDL not RDL

Lab Sample ID: S16969.03 (continued)
Sample Tag: SB-2 5-6'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/02/20 14:59, Analyst: JML (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorobenzene	Not detected	70		ug/kg	72.4	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	72.4	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	72.4	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	72.4		
o-Xylene	Not detected	70		ug/kg	72.4	95-47-6	
Styrene	Not detected	70		ug/kg	72.4	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	72.4	98-82-8	
Bromoform	Not detected	100		ug/kg	72.4	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	72.4	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	72.4	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	72.4	103-65-1	
Bromobenzene	Not detected	100		ug/kg	72.4	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	72.4	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	72.4	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	72.4	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	72.4	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	72.4	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	72.4	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	72.4	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	72.4	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	72.4	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	72.4	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	72.4	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	72.4	96-12-8	
1,2,4-Trichlorobenzene	Not detected	480		ug/kg	72.4	120-82-1	
1,2,3-Trichlorobenzene	Not detected	480		ug/kg	72.4	87-61-6	
Naphthalene	Not detected	400		ug/kg	72.4	91-20-3	
2-Methylnaphthalene	200	100		ug/kg	72.4	91-57-6	

Lab Sample ID: S16969.04
Sample Tag: SB-3 4-5'
Collected Date/Time: 08/27/2020 10:44
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	08/31/20 14:15	JRH	
Extraction, PCB*	Completed	SW3546	08/27/20 16:00	CM	
PNA Extraction*	Completed	SW3546	08/27/20 22:54	PTW	
Sample wt. (g) / Methanol (ml)*	16.866/16	SW5035A	08/31/20 14:21	JML	

Inorganics

Method: SM2540B, Run Date: 08/28/20 09:47, Analyst: BML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	84	1		%	1		

Metals

Method: SW6020A, Run Date: 08/31/20 14:52, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Cadmium	0.46	0.20		mg/kg	232	7440-43-9	
Chromium	16.9	0.50		mg/kg	232	7440-47-3	
Lead	33.8	0.30		mg/kg	232	7439-92-1	

Organics - PCBs/Pesticides

PCB List, Method: SW8082A, Run Date: 08/28/20 14:43, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	1	12674-11-2	
PCB-1242	Not detected	330		ug/kg	1	53469-21-9	
PCB-1221	Not detected	330		ug/kg	1	11104-28-2	
PCB-1232	Not detected	330		ug/kg	1	11141-16-5	
PCB-1248	Not detected	330		ug/kg	1	12672-29-6	
PCB-1254	Not detected	330		ug/kg	1	11097-69-1	
PCB-1260	Not detected	330		ug/kg	1	11096-82-5	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 01:15, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	10	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	10	208-96-8	
Anthracene	Not detected	300		ug/kg	10	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	10	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	10	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	10	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	10	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	10	191-24-2	
Chrysene	Not detected	300		ug/kg	10	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	10	53-70-3	

Lab Sample ID: S16969.04 (continued)
Sample Tag: SB-3 4-5'

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 01:15, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoranthene	Not detected	300		ug/kg	10	206-44-0	
Fluorene	Not detected	300		ug/kg	10	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	10	193-39-5	
Naphthalene	Not detected	300		ug/kg	10	91-20-3	
Phenanthrene	Not detected	300		ug/kg	10	85-01-8	
Pyrene	Not detected	300		ug/kg	10	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	10	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/02/20 15:19, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	66	60-29-7	
Acetone	Not detected	1,000		ug/kg	66	67-64-1	
Methyl iodide	Not detected	100		ug/kg	66	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	66	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	66	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	66	107-13-1	
2-Butanone (MEK)	Not detected	990		ug/kg	66	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	66	75-71-8	
Chloromethane	Not detected	300		ug/kg	66	74-87-3	
Vinyl chloride	Not detected	70		ug/kg	66	75-01-4	
Bromomethane	Not detected	300		ug/kg	66	74-83-9	
Chloroethane	Not detected	300		ug/kg	66	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	66	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	66	75-35-4	
Methylene chloride	Not detected	100		ug/kg	66	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	66	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	66	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	66	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	66	109-99-9	
Chloroform	Not detected	70		ug/kg	66	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	66	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	66	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	66	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	66	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	66	56-23-5	
Benzene	Not detected	70		ug/kg	66	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	66	107-06-2	
Trichloroethene	Not detected	70		ug/kg	66	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	66	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	66	75-27-4	
Dibromomethane	Not detected	300		ug/kg	66	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	66	10061-01-5	
Toluene	Not detected	70		ug/kg	66	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	66	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	66	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	66	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	66	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	66	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	66	106-93-4	M

M-Result reported to MDL not RDL

Lab Sample ID: S16969.04 (continued)
Sample Tag: SB-3 4-5'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/02/20 15:19, Analyst: JML (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorobenzene	Not detected	70		ug/kg	66	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	66	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	66	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	66		
o-Xylene	Not detected	70		ug/kg	66	95-47-6	
Styrene	Not detected	70		ug/kg	66	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	66	98-82-8	
Bromoform	Not detected	100		ug/kg	66	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	66	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	66	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	66	103-65-1	
Bromobenzene	Not detected	100		ug/kg	66	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	66	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	66	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	66	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	66	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	66	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	66	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	66	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	66	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	66	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	66	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	66	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	66	96-12-8	
1,2,4-Trichlorobenzene	Not detected	440		ug/kg	66	120-82-1	
1,2,3-Trichlorobenzene	Not detected	440		ug/kg	66	87-61-6	
Naphthalene	Not detected	300		ug/kg	66	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	66	91-57-6	

Lab Sample ID: S16969.05
Sample Tag: SB-3 8-9'
Collected Date/Time: 08/27/2020 10:49
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	08/31/20 14:15	JRH	
Extraction, PCB*	Completed	SW3546	08/27/20 16:00	CM	
PNA Extraction*	Completed	SW3546	08/27/20 22:54	PTW	
Sample wt. (g) / Methanol (ml)*	12.874/12	SW5035A	08/31/20 14:21	JML	

Inorganics

Method: SM2540B, Run Date: 08/28/20 09:47, Analyst: BML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	85	1		%	1		

Metals

Method: SW6020A, Run Date: 08/31/20 14:53, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Cadmium	Not detected	0.20		mg/kg	239	7440-43-9	
Chromium	14.3	0.50		mg/kg	239	7440-47-3	
Lead	7.83	0.30		mg/kg	239	7439-92-1	

Organics - PCBs/Pesticides

PCB List, Method: SW8082A, Run Date: 08/28/20 13:24, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	1	12674-11-2	
PCB-1242	Not detected	330		ug/kg	1	53469-21-9	
PCB-1221	Not detected	330		ug/kg	1	11104-28-2	
PCB-1232	Not detected	330		ug/kg	1	11141-16-5	
PCB-1248	Not detected	330		ug/kg	1	12672-29-6	
PCB-1254	Not detected	330		ug/kg	1	11097-69-1	
PCB-1260	Not detected	330		ug/kg	1	11096-82-5	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 01:37, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	10	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	10	208-96-8	
Anthracene	Not detected	300		ug/kg	10	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	10	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	10	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	10	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	10	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	10	191-24-2	
Chrysene	Not detected	300		ug/kg	10	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	10	53-70-3	

Lab Sample ID: S16969.05 (continued)
Sample Tag: SB-3 8-9'

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 01:37, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoranthene	Not detected	300		ug/kg	10	206-44-0	
Fluorene	Not detected	300		ug/kg	10	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	10	193-39-5	
Naphthalene	Not detected	300		ug/kg	10	91-20-3	
Phenanthrene	Not detected	300		ug/kg	10	85-01-8	
Pyrene	Not detected	300		ug/kg	10	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	10	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/01/20 15:52, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	63.7	60-29-7	
Acetone	Not detected	1,000		ug/kg	63.7	67-64-1	
Methyl iodide	Not detected	100		ug/kg	63.7	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	63.7	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	63.7	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	63.7	107-13-1	
2-Butanone (MEK)	Not detected	960		ug/kg	63.7	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	63.7	75-71-8	
Chloromethane	Not detected	300		ug/kg	63.7	74-87-3	
Vinyl chloride	Not detected	60		ug/kg	63.7	75-01-4	
Bromomethane	Not detected	300		ug/kg	63.7	74-83-9	
Chloroethane	Not detected	300		ug/kg	63.7	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	63.7	75-69-4	
1,1-Dichloroethene	Not detected	60		ug/kg	63.7	75-35-4	
Methylene chloride	Not detected	100		ug/kg	63.7	75-09-2	
trans-1,2-Dichloroethene	Not detected	60		ug/kg	63.7	156-60-5	
1,1-Dichloroethane	Not detected	60		ug/kg	63.7	75-34-3	
cis-1,2-Dichloroethene	Not detected	60		ug/kg	63.7	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	63.7	109-99-9	
Chloroform	Not detected	60		ug/kg	63.7	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	63.7	74-97-5	
1,1,1-Trichloroethane	Not detected	60		ug/kg	63.7	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	63.7	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	63.7	591-78-6	
Carbon tetrachloride	Not detected	60		ug/kg	63.7	56-23-5	
Benzene	Not detected	60		ug/kg	63.7	71-43-2	
1,2-Dichloroethane	Not detected	60		ug/kg	63.7	107-06-2	
Trichloroethene	Not detected	60		ug/kg	63.7	79-01-6	
1,2-Dichloropropane	Not detected	60		ug/kg	63.7	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	63.7	75-27-4	
Dibromomethane	Not detected	300		ug/kg	63.7	74-95-3	
cis-1,3-Dichloropropene	Not detected	60		ug/kg	63.7	10061-01-5	
Toluene	Not detected	60		ug/kg	63.7	108-88-3	
trans-1,3-Dichloropropene	Not detected	60		ug/kg	63.7	10061-02-6	
1,1,2-Trichloroethane	Not detected	60		ug/kg	63.7	79-00-5	
Tetrachloroethene	Not detected	60		ug/kg	63.7	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	60		ug/kg	63.7	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	63.7	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	63.7	106-93-4	M

M-Result reported to MDL not RDL

Lab Sample ID: S16969.05 (continued)
Sample Tag: SB-3 8-9'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/01/20 15:52, Analyst: JML (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorobenzene	Not detected	60		ug/kg	63.7	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	63.7	630-20-6	
Ethylbenzene	Not detected	60		ug/kg	63.7	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	63.7		
o-Xylene	Not detected	60		ug/kg	63.7	95-47-6	
Styrene	Not detected	60		ug/kg	63.7	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	63.7	98-82-8	
Bromoform	Not detected	100		ug/kg	63.7	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	60		ug/kg	63.7	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	63.7	96-18-4	
n-Propylbenzene	Not detected	60		ug/kg	63.7	103-65-1	
Bromobenzene	Not detected	100		ug/kg	63.7	108-86-1	
1,3,5-Trimethylbenzene	Not detected	60		ug/kg	63.7	108-67-8	
tert-Butylbenzene	Not detected	60		ug/kg	63.7	98-06-6	
1,2,4-Trimethylbenzene	Not detected	60		ug/kg	63.7	95-63-6	
sec-Butylbenzene	Not detected	60		ug/kg	63.7	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	63.7	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	63.7	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	63.7	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	63.7	95-50-1	
1,2,3-Trimethylbenzene	Not detected	60		ug/kg	63.7	526-73-8	
n-Butylbenzene	Not detected	60		ug/kg	63.7	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	63.7	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	63.7	96-12-8	
1,2,4-Trichlorobenzene	Not detected	420		ug/kg	63.7	120-82-1	
1,2,3-Trichlorobenzene	Not detected	420		ug/kg	63.7	87-61-6	
Naphthalene	Not detected	300		ug/kg	63.7	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	63.7	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S16969.06
Sample Tag: SB-4 5-6'
Collected Date/Time: 08/27/2020 11:23
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	08/31/20 14:15	JRH	
Extraction, PCB*	Completed	SW3546	08/27/20 16:00	CM	
PNA Extraction*	Completed	SW3546	08/27/20 22:54	PTW	
Sample wt. (g) / Methanol (ml)*	17.925/17	SW5035A	08/31/20 14:21	JML	

Inorganics

Method: SM2540B, Run Date: 08/28/20 09:47, Analyst: BML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	84	1		%	1		

Metals

Method: SW6020A, Run Date: 08/31/20 14:55, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Cadmium	Not detected	0.20		mg/kg	243	7440-43-9	
Chromium	13.2	0.50		mg/kg	243	7440-47-3	
Lead	48.3	0.30		mg/kg	243	7439-92-1	

Organics - PCBs/Pesticides

PCB List, Method: SW8082A, Run Date: 08/28/20 14:55, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	1	12674-11-2	
PCB-1242	Not detected	330		ug/kg	1	53469-21-9	
PCB-1221	Not detected	330		ug/kg	1	11104-28-2	
PCB-1232	Not detected	330		ug/kg	1	11141-16-5	
PCB-1248	Not detected	330		ug/kg	1	12672-29-6	
PCB-1254	Not detected	330		ug/kg	1	11097-69-1	
PCB-1260	Not detected	330		ug/kg	1	11096-82-5	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 02:00, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	10	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	10	208-96-8	
Anthracene	Not detected	300		ug/kg	10	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	10	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	10	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	10	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	10	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	10	191-24-2	
Chrysene	Not detected	300		ug/kg	10	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	10	53-70-3	

Lab Sample ID: S16969.06 (continued)
Sample Tag: SB-4 5-6'

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/29/20 02:00, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoranthene	Not detected	300		ug/kg	10	206-44-0	
Fluorene	Not detected	300		ug/kg	10	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	10	193-39-5	
Naphthalene	Not detected	300		ug/kg	10	91-20-3	
Phenanthrene	Not detected	300		ug/kg	10	85-01-8	
Pyrene	Not detected	300		ug/kg	10	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	10	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/01/20 16:10, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	66	60-29-7	
Acetone	Not detected	1,000		ug/kg	66	67-64-1	
Methyl iodide	Not detected	100		ug/kg	66	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	66	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	66	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	66	107-13-1	
2-Butanone (MEK)	Not detected	990		ug/kg	66	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	66	75-71-8	
Chloromethane	Not detected	300		ug/kg	66	74-87-3	
Vinyl chloride	Not detected	70		ug/kg	66	75-01-4	
Bromomethane	Not detected	300		ug/kg	66	74-83-9	
Chloroethane	Not detected	300		ug/kg	66	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	66	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	66	75-35-4	
Methylene chloride	Not detected	100		ug/kg	66	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	66	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	66	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	66	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	66	109-99-9	
Chloroform	Not detected	70		ug/kg	66	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	66	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	66	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	66	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	66	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	66	56-23-5	
Benzene	Not detected	70		ug/kg	66	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	66	107-06-2	
Trichloroethene	Not detected	70		ug/kg	66	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	66	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	66	75-27-4	
Dibromomethane	Not detected	300		ug/kg	66	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	66	10061-01-5	
Toluene	Not detected	70		ug/kg	66	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	66	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	66	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	66	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	66	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	66	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	66	106-93-4	M

M-Result reported to MDL not RDL

Lab Sample ID: S16969.06 (continued)
Sample Tag: SB-4 5-6'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 09/01/20 16:10, Analyst: JML (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorobenzene	Not detected	70		ug/kg	66	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	66	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	66	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	66		
o-Xylene	Not detected	70		ug/kg	66	95-47-6	
Styrene	Not detected	70		ug/kg	66	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	66	98-82-8	
Bromoform	Not detected	100		ug/kg	66	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	66	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	66	96-18-4	
n-Propylbenzene	160	70		ug/kg	66	103-65-1	
Bromobenzene	Not detected	100		ug/kg	66	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	66	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	66	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	66	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	66	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	66	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	66	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	66	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	66	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	66	526-73-8	
n-Butylbenzene	70	70		ug/kg	66	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	66	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	66	96-12-8	
1,2,4-Trichlorobenzene	Not detected	440		ug/kg	66	120-82-1	
1,2,3-Trichlorobenzene	Not detected	440		ug/kg	66	87-61-6	
Naphthalene	Not detected	300		ug/kg	66	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	66	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S16969.07
Sample Tag: SB-5 4-5'
Collected Date/Time: 08/27/2020 10:10
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	08/28/20 12:30	JL	
Sample wt. (g) / Methanol (ml)*	16.537/16	SW5035A	08/31/20 14:21	JML	

Inorganics

Method: SM2540B, Run Date: 08/28/20 09:47, Analyst: BML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	82	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 08/31/20 19:53, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	10	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	10	208-96-8	
Anthracene	Not detected	300		ug/kg	10	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	10	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	10	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	10	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	10	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	10	191-24-2	
Chrysene	Not detected	300		ug/kg	10	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	10	53-70-3	
Fluoranthene	Not detected	300		ug/kg	10	206-44-0	
Fluorene	Not detected	300		ug/kg	10	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	10	193-39-5	
Naphthalene	2,200	300		ug/kg	10	91-20-3	
Phenanthrene	Not detected	300		ug/kg	10	85-01-8	
Pyrene	Not detected	300		ug/kg	10	129-00-0	
2-Methylnaphthalene	2,100	300		ug/kg	10	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 08/31/20 20:18, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	70	60-29-7	
Acetone	Not detected	4,000		ug/kg	70	67-64-1	X
Methyl iodide	Not detected	100		ug/kg	70	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	70	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	70	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	70	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	70	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	70	75-71-8	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S16969.07 (continued)
Sample Tag: SB-5 4-5'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 08/31/20 20:18, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	400		ug/kg	70	74-87-3	
Vinyl chloride	Not detected	70		ug/kg	70	75-01-4	
Bromomethane	Not detected	300		ug/kg	70	74-83-9	
Chloroethane	Not detected	400		ug/kg	70	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	70	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	70	75-35-4	
Methylene chloride	Not detected	100		ug/kg	70	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	70	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	70	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	70	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	70	109-99-9	
Chloroform	Not detected	70		ug/kg	70	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	70	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	70	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	70	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	70	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	70	56-23-5	
Benzene	Not detected	70		ug/kg	70	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	70	107-06-2	
Trichloroethene	Not detected	70		ug/kg	70	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	70	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	70	75-27-4	
Dibromomethane	Not detected	400		ug/kg	70	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	70	10061-01-5	
Toluene	160	70		ug/kg	70	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	70	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	70	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	70	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	70	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	70	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	70	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	70	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	70	630-20-6	
Ethylbenzene	1,400	70		ug/kg	70	100-41-4	
p,m-Xylene	400	100		ug/kg	70		
o-Xylene	Not detected	70		ug/kg	70	95-47-6	
Styrene	Not detected	70		ug/kg	70	100-42-5	
Isopropylbenzene	1,700	400		ug/kg	70	98-82-8	
Bromoform	Not detected	100		ug/kg	70	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	70	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	70	96-18-4	
n-Propylbenzene	6,890	70		ug/kg	70	103-65-1	
Bromobenzene	Not detected	100		ug/kg	70	108-86-1	
1,3,5-Trimethylbenzene	640	70		ug/kg	70	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	70	98-06-6	
1,2,4-Trimethylbenzene	160	70		ug/kg	70	95-63-6	
sec-Butylbenzene	800	70		ug/kg	70	135-98-8	
p-Isopropyltoluene	200	100		ug/kg	70	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	70	541-73-1	

M-Result reported to MDL not RDL

Lab Sample ID: S16969.07 (continued)
Sample Tag: SB-5 4-5'

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 08/31/20 20:18, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dichlorobenzene	Not detected	100		ug/kg	70	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	70	95-50-1	
1,2,3-Trimethylbenzene	350	70		ug/kg	70	526-73-8	
n-Butylbenzene	2,410	70		ug/kg	70	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	70	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	70	96-12-8	
1,2,4-Trichlorobenzene	Not detected	460		ug/kg	70	120-82-1	
1,2,3-Trichlorobenzene	Not detected	460		ug/kg	70	87-61-6	
Naphthalene	3,300	400		ug/kg	70	91-20-3	
2-Methylnaphthalene	3,400	100		ug/kg	70	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S16969.08
Sample Tag: SB-5 7.5-8.5'
Collected Date/Time: 08/27/2020 10:15
Matrix: Soil
COC Reference: 136745

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	4.9	IR
1	40ml Glass	MeOH	Yes	4.9	IR

Other / Misc.

Method: , Run Date: 08/28/20 14:20, Analyst: MMC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Merit Laboratories Login Checklist

Lab Set ID: S16969
Client: PME02 (PM Environmental, Inc. - Berkley)
Project: 01-12411-0-0001
Submitted: 08/27/2020 15:00 Login User: REJ

Attention: Jana Beumel
Address: PM Environmental, Inc.
4080 W. Eleven Mile
Berkley, MI 48072

Phone: O:248-336-9988 FAX:
Email: Beumel@pmenv.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.9
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

136745

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Sara Baumel
COMPANY: PM Environmental
ADDRESS: 4080 W. 11 Mile Rd
CITY: Berkley STATE: MI ZIP CODE: 48072
PHONE NO.: 248-414-1459 FAX NO.:
E-MAIL ADDRESS: baume@pmenv.com P.O. NO.:
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 01-12411-0-0001
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Danielle Wilcox

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

VOCs + PNAs, PCBs, Cr, Pb

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER
16969.01	8/27/20	9:06	SB-1 6-7'	S	2	1					1	
.02		9:11	SB-1 13.5-14.5'	S	2	1					1	
.03		9:40	SB-2 5-6'	S	2	1					1	
.04		10:44	SB-3 4-5'	S	2	1					1	
.05		10:49	SB-3 8-9'	S	2	1					1	
.06		11:23	SB-4 5-6'	S	2	1					1	
.07		10:10	SB-5 4-5'	S	2	1					1	
.08	↓	10:15	SB-5 7.5-8.5'	S	2	1					1	

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	☒ Sampler	8-27-20	12:45
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
PM Cold Storage		8-27-20	12:45
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		8/27/20	1800
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		8/27/20	1800

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
	8/27/20	1340

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.9

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.

Analytical Laboratory Report

Report ID: S16982.01(01)
Generated on 09/02/2020

Report to

Attention: Jana Beumel
PM Environmental, Inc.
4080 W. Eleven Mile
Berkley, MI 48072

Phone: O:248-336-9988 D:248-414-1859 FAX:
Email: Beumel@pmenv.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S16982.01-S16982.03
Project: 01-12411-0-0001
Collected Date(s): 08/27/2020
Submitted Date/Time: 08/27/2020 15:00
Sampled by: Ben Silvi
P.O. #: 01-12411-0-0001

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
TO-15	EPA TO-15 Second Edition January 1999

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S16982.01	SG-1	Air	08/27/20 10:00 - 08/27/20 10:07
S16982.02	SG-3	Air	08/27/20 11:35 - 08/27/20 11:45
S16982.03	SG-5	Air	08/27/20 11:00 - 08/27/20 11:10

Analytical Laboratory Report

Lab Sample ID: S16982.01
Sample Tag: SG-1
Collected Date/Time: 08/27/2020 10:00 - 08/27/2020 10:07
Matrix: Air
COC Reference: A4205

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	N/A

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	-10	N/A	08/27/20 16:15	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 08/28/20 11:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	340		ppbv	170	67-64-1	Y
1,3-Butadiene	Not detected	30		ppbv	170	106-99-0	Y
Benzene	150	30		ppbv	170	71-43-2	Y
Bromodichloromethane	Not detected	30		ppbv	170	75-27-4	Y
Bromoform	Not detected	30		ppbv	170	75-25-2	Y
Bromomethane	Not detected	30		ppbv	170	74-83-9	Y
Vinyl bromide	Not detected	30		ppbv	170	593-60-2	Y
Benzyl chloride	Not detected	30		ppbv	170	100-44-7	Y
Carbon disulfide	Not detected	90		ppbv	170	75-15-0	Y
Chlorobenzene	Not detected	30		ppbv	170	108-90-7	Y
Chloroethane	Not detected	30		ppbv	170	75-00-3	Y
Chloroform	Not detected	30		ppbv	170	67-66-3	Y
Chloromethane	Not detected	30		ppbv	170	74-87-3	Y
3-Chloropropene	Not detected	30		ppbv	170	107-05-1	Y
2-Chlorotoluene	Not detected	30		ppbv	170	95-49-8	Y
Carbon tetrachloride	Not detected	30		ppbv	170	56-23-5	Y
Cyclohexane	1,800	30		ppbv	170	110-82-7	Y
1,1-Dichloroethane	Not detected	30		ppbv	170	75-34-3	Y
1,1-Dichloroethene	Not detected	30		ppbv	170	75-35-4	Y
1,2-Dibromoethane	Not detected	30		ppbv	170	106-93-4	Y
1,2-Dichloroethane	Not detected	30		ppbv	170	107-06-2	Y
1,2-Dichloropropane	Not detected	30		ppbv	170	78-87-5	Y
1,4-Dioxane	Not detected	430		ppbv	170	123-91-1	Y
Dichlorodifluoromethane	Not detected	30		ppbv	170	75-71-8	Y
Dibromochloromethane	Not detected	30		ppbv	170	124-48-1	Y
trans-1,2-Dichloroethene	Not detected	30		ppbv	170	156-60-5	Y
cis-1,2-Dichloroethene	Not detected	30		ppbv	170	156-59-2	Y
cis-1,3-Dichloropropene	Not detected	30		ppbv	170	10061-01-5	Y
1,3-Dichlorobenzene	Not detected	30		ppbv	170	541-73-1	Y
1,2-Dichlorobenzene	Not detected	30		ppbv	170	95-50-1	Y
1,4-Dichlorobenzene	Not detected	30		ppbv	170	106-46-7	Y
trans-1,3-Dichloropropene	Not detected	30		ppbv	170	10061-02-6	Y
Ethanol*	Not detected	430		ppbv	170	64-17-5	Y
Ethylbenzene	110	30		ppbv	170	100-41-4	Y
Ethyl Acetate*	Not detected	170		ppbv	170	141-78-6	Y
4-Ethyltoluene	Not detected	30		ppbv	170	622-96-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S16982.01 (continued)
Sample Tag: SG-1

TO-15, Method: TO-15, Run Date: 08/28/20 11:38, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 113	Not detected	30		ppbv	170	76-13-1	Y
Freon 114	Not detected	30		ppbv	170	76-14-2	Y
Heptane	2,060	30		ppbv	170	142-82-5	Y
Hexachlorobutadiene	Not detected	30		ppbv	170	87-68-3	Y
Hexane	1,000	30		ppbv	170	110-54-3	Y
2-Hexanone*	Not detected	90		ppbv	170	591-78-6	Y
Isopropyl Alcohol*	Not detected	340		ppbv	170	67-63-0	Y
Methylene chloride	Not detected	90		ppbv	170	75-09-2	Y
2-Butanone (MEK)	Not detected	170		ppbv	170	78-93-3	Y
4-Methyl-2-pentanone (MIBK)	Not detected	90		ppbv	170	108-10-1	Y
tert-Methyl butyl ether (MTBE)	Not detected	30		ppbv	170	1634-04-4	Y
Methyl methacrylate	Not detected	30		ppbv	170	80-62-6	Y
Naphthalene	Not detected	30		ppbv	170	91-20-3	Y
Propylene*	Not detected	2,000		ppbv	170	115-07-1	Y
Styrene	Not detected	30		ppbv	170	100-42-5	Y
1,1,1-Trichloroethane	Not detected	30		ppbv	170	71-55-6	Y
1,1,2,2-Tetrachloroethane	Not detected	30		ppbv	170	79-34-5	Y
1,1,2-Trichloroethane	Not detected	30		ppbv	170	79-00-5	Y
1,2,4-Trichlorobenzene	Not detected	90		ppbv	170	120-82-1	Y
1,2,4-Trimethylbenzene	Not detected	30		ppbv	170	95-63-6	Y
1,3,5-Trimethylbenzene	Not detected	30		ppbv	170	108-67-8	Y
2,2,4-Trimethylpentane	Not detected	251		ppbv	170	540-84-1	YX
Tert-butyl Alcohol	Not detected	170		ppbv	170	75-65-0	Y
Tetrachloroethene	Not detected	30		ppbv	170	127-18-4	Y
Tetrahydrofuran*	Not detected	30		ppbv	170	109-99-9	Y
Toluene	350	30		ppbv	170	108-88-3	Y
Trichloroethene	Not detected	30		ppbv	170	79-01-6	Y
Trichlorofluoromethane	Not detected	30		ppbv	170	75-69-4	Y
Vinyl chloride	Not detected	30		ppbv	170	75-01-4	Y
Vinyl acetate	Not detected	30		ppbv	170	108-05-4	Y
p,m-Xylene	610	70		ppbv	170		Y
o-Xylene	230	30		ppbv	170	95-47-6	Y
Total Xylenes	800	100		ppbv	170	1330-20-7	Y

TO-15, Method: TO-15, Run Date: 08/28/20 11:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	810		ug/m3	170	67-64-1	Y
1,3-Butadiene	Not detected	66		ug/m3	170	106-99-0	Y
Benzene	480	96		ug/m3	170	71-43-2	Y
Bromodichloromethane	Not detected	200		ug/m3	170	75-27-4	Y
Bromoform	Not detected	310		ug/m3	170	75-25-2	Y
Bromomethane	Not detected	120		ug/m3	170	74-83-9	Y
Vinyl bromide	Not detected	130		ug/m3	170	593-60-2	Y
Benzyl chloride	Not detected	160		ug/m3	170	100-44-7	Y
Carbon disulfide	Not detected	280		ug/m3	170	75-15-0	Y
Chlorobenzene	Not detected	140		ug/m3	170	108-90-7	Y
Chloroethane	Not detected	79		ug/m3	170	75-00-3	Y
Chloroform	Not detected	150		ug/m3	170	67-66-3	Y

Y-Elevated reporting limit due to high target concentration
X-Elevated reporting limit due to matrix interference

Lab Sample ID: S16982.01 (continued)
Sample Tag: SG-1

TO-15, Method: TO-15, Run Date: 08/28/20 11:38, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	62		ug/m3	170	74-87-3	Y
3-Chloropropene	Not detected	94		ug/m3	170	107-05-1	Y
2-Chlorotoluene	Not detected	160		ug/m3	170	95-49-8	Y
Carbon tetrachloride	Not detected	190		ug/m3	170	56-23-5	Y
Cyclohexane	6,200	100		ug/m3	170	110-82-7	Y
1,1-Dichloroethane	Not detected	120		ug/m3	170	75-34-3	Y
1,1-Dichloroethene	Not detected	120		ug/m3	170	75-35-4	Y
1,2-Dibromoethane	Not detected	230		ug/m3	170	106-93-4	Y
1,2-Dichloroethane	Not detected	120		ug/m3	170	107-06-2	Y
1,2-Dichloropropane	Not detected	140		ug/m3	170	78-87-5	Y
1,4-Dioxane	Not detected	1,500		ug/m3	170	123-91-1	Y
Dichlorodifluoromethane	Not detected	150		ug/m3	170	75-71-8	Y
Dibromochloromethane	Not detected	260		ug/m3	170	124-48-1	Y
trans-1,2-Dichloroethene	Not detected	120		ug/m3	170	156-60-5	Y
cis-1,2-Dichloroethene	Not detected	120		ug/m3	170	156-59-2	Y
cis-1,3-Dichloropropene	Not detected	140		ug/m3	170	10061-01-5	Y
1,3-Dichlorobenzene	Not detected	180		ug/m3	170	541-73-1	Y
1,2-Dichlorobenzene	Not detected	180		ug/m3	170	95-50-1	Y
1,4-Dichlorobenzene	Not detected	180		ug/m3	170	106-46-7	Y
trans-1,3-Dichloropropene	Not detected	140		ug/m3	170	10061-02-6	Y
Ethanol*	Not detected	810		ug/m3	170	64-17-5	Y
Ethylbenzene	480	130		ug/m3	170	100-41-4	Y
Ethyl Acetate*	Not detected	610		ug/m3	170	141-78-6	Y
4-Ethyltoluene	Not detected	150		ug/m3	170	622-96-8	Y
Freon 113	Not detected	230		ug/m3	170	76-13-1	Y
Freon 114	Not detected	210		ug/m3	170	76-14-2	Y
Heptane	8,440	120		ug/m3	170	142-82-5	Y
Hexachlorobutadiene	Not detected	320		ug/m3	170	87-68-3	Y
Hexane	3,500	110		ug/m3	170	110-54-3	Y
2-Hexanone*	Not detected	370		ug/m3	170	591-78-6	Y
Isopropyl Alcohol*	Not detected	840		ug/m3	170	67-63-0	Y
Methylene chloride	Not detected	310		ug/m3	170	75-09-2	Y
2-Butanone (MEK)	Not detected	500		ug/m3	170	78-93-3	Y
4-Methyl-2-pentanone (MIBK)	Not detected	370		ug/m3	170	108-10-1	Y
tert-Methyl butyl ether (MTBE)	Not detected	110		ug/m3	170	1634-04-4	Y
Methyl methacrylate	Not detected	120		ug/m3	170	80-62-6	Y
Naphthalene	Not detected	160		ug/m3	170	91-20-3	Y
Propylene*	Not detected	3,400		ug/m3	170	115-07-1	Y
Styrene	Not detected	130		ug/m3	170	100-42-5	Y
1,1,1-Trichloroethane	Not detected	160		ug/m3	170	71-55-6	Y
1,1,2,2-Tetrachloroethane	Not detected	210		ug/m3	170	79-34-5	Y
1,1,2-Trichloroethane	Not detected	160		ug/m3	170	79-00-5	Y
1,2,4-Trichlorobenzene	Not detected	670		ug/m3	170	120-82-1	Y
1,2,4-Trimethylbenzene	Not detected	150		ug/m3	170	95-63-6	Y
1,3,5-Trimethylbenzene	Not detected	150		ug/m3	170	108-67-8	Y
2,2,4-Trimethylpentane	Not detected	1,170		ug/m3	170	540-84-1	YX
Tert-butyl Alcohol	Not detected	520		ug/m3	170	75-65-0	Y
Tetrachloroethene	Not detected	200		ug/m3	170	127-18-4	Y

Y-Elevated reporting limit due to high target concentration
X-Elevated reporting limit due to matrix interference

Lab Sample ID: S16982.01 (continued)
Sample Tag: SG-1

TO-15, Method: TO-15, Run Date: 08/28/20 11:38, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Tetrahydrofuran*	Not detected	88		ug/m3	170	109-99-9	Y
Toluene	1,300	110		ug/m3	170	108-88-3	Y
Trichloroethene	Not detected	160		ug/m3	170	79-01-6	Y
Trichlorofluoromethane	Not detected	170		ug/m3	170	75-69-4	Y
Vinyl chloride	Not detected	77		ug/m3	170	75-01-4	Y
Vinyl acetate	Not detected	110		ug/m3	170	108-05-4	Y
p,m-Xylene	2,600	300		ug/m3	170		Y
o-Xylene	1,000	130		ug/m3	170	95-47-6	Y
Total Xylenes	3,500	430		ug/m3	170	1330-20-7	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S16982.02
Sample Tag: SG-3
Collected Date/Time: 08/27/2020 11:35 - 08/27/2020 11:45
Matrix: Air
COC Reference: A4205

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	N/A

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	-9	N/A	08/27/20 16:15	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 08/28/20 07:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	140	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	2		ppbv	10	106-99-0	
Benzene	10	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	9		ppbv	10	75-00-3	X
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	2		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	37	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	45	25		ppbv	10	64-17-5	
Ethylbenzene	23	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	10		ppbv	10	141-78-6	
4-Ethyltoluene	17	2		ppbv	10	622-96-8	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S16982.02 (continued)
Sample Tag: SG-3

TO-15, Method: TO-15, Run Date: 08/28/20 07:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 113	Not detected	2		ppbv	10	76-13-1	
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	80	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	29	2		ppbv	10	110-54-3	
2-Hexanone*	11	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	150	10		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	100		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	47	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	19	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	31	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	5	2		ppbv	10	127-18-4	
Tetrahydrofuran*	5	2		ppbv	10	109-99-9	
Toluene	46	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	187	4		ppbv	10		
o-Xylene	75	2		ppbv	10	95-47-6	
Total Xylenes	262	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 08/28/20 07:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	330	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	4.4		ug/m3	10	106-99-0	
Benzene	32	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	24		ug/m3	10	75-00-3	X
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	4.1		ug/m3	10	74-87-3	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S16982.02 (continued)
Sample Tag: SG-3

TO-15, Method: TO-15, Run Date: 08/28/20 07:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	130	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	85	47		ug/m3	10	64-17-5	
Ethylbenzene	100	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	36		ug/m3	10	141-78-6	
4-Ethyltoluene	84	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	330	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	100	7.0		ug/m3	10	110-54-3	
2-Hexanone*	45	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	440	29		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	170		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	230	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	93	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	140	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	34	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	15	5.9		ug/m3	10	109-99-9	
Toluene	170	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	

Lab Sample ID: S16982.02 (continued)
Sample Tag: SG-3

TO-15, Method: TO-15, Run Date: 08/28/20 07:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	812	17		ug/m3	10		
o-Xylene	330	8.7		ug/m3	10	95-47-6	
Total Xylenes	1,140	26		ug/m3	10	1330-20-7	

Lab Sample ID: S16982.03
Sample Tag: SG-5
Collected Date/Time: 08/27/2020 11:00 - 08/27/2020 11:10
Matrix: Air
COC Reference: A4205

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	N/A

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	-9	N/A	08/27/20 16:15	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 08/28/20 18:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	1,500		ppbv	753	67-64-1	Y
1,3-Butadiene	Not detected	200		ppbv	753	106-99-0	Y
Benzene	Not detected	200		ppbv	753	71-43-2	Y
Bromodichloromethane	Not detected	200		ppbv	753	75-27-4	Y
Bromoform	Not detected	200		ppbv	753	75-25-2	Y
Bromomethane	Not detected	200		ppbv	753	74-83-9	Y
Vinyl bromide	Not detected	200		ppbv	753	593-60-2	Y
Benzyl chloride	Not detected	200		ppbv	753	100-44-7	Y
Carbon disulfide	Not detected	400		ppbv	753	75-15-0	Y
Chlorobenzene	Not detected	200		ppbv	753	108-90-7	Y
Chloroethane	Not detected	200		ppbv	753	75-00-3	Y
Chloroform	Not detected	200		ppbv	753	67-66-3	Y
Chloromethane	Not detected	200		ppbv	753	74-87-3	Y
3-Chloropropene	Not detected	200		ppbv	753	107-05-1	Y
2-Chlorotoluene	Not detected	200		ppbv	753	95-49-8	Y
Carbon tetrachloride	Not detected	200		ppbv	753	56-23-5	Y
Cyclohexane	36,300	200		ppbv	753	110-82-7	Y
1,1-Dichloroethane	Not detected	200		ppbv	753	75-34-3	Y
1,1-Dichloroethene	Not detected	200		ppbv	753	75-35-4	Y
1,2-Dibromoethane	Not detected	200		ppbv	753	106-93-4	Y
1,2-Dichloroethane	Not detected	200		ppbv	753	107-06-2	Y
1,2-Dichloropropane	Not detected	200		ppbv	753	78-87-5	Y
1,4-Dioxane	Not detected	1,900		ppbv	753	123-91-1	Y
Dichlorodifluoromethane	Not detected	200		ppbv	753	75-71-8	Y
Dibromochloromethane	Not detected	200		ppbv	753	124-48-1	Y
trans-1,2-Dichloroethene	Not detected	200		ppbv	753	156-60-5	Y
cis-1,2-Dichloroethene	Not detected	200		ppbv	753	156-59-2	Y
cis-1,3-Dichloropropene	Not detected	200		ppbv	753	10061-01-5	Y
1,3-Dichlorobenzene	Not detected	200		ppbv	753	541-73-1	Y
1,2-Dichlorobenzene	Not detected	200		ppbv	753	95-50-1	Y
1,4-Dichlorobenzene	Not detected	200		ppbv	753	106-46-7	Y
trans-1,3-Dichloropropene	Not detected	200		ppbv	753	10061-02-6	Y
Ethanol*	Not detected	1,900		ppbv	753	64-17-5	Y
Ethylbenzene	3,100	200		ppbv	753	100-41-4	Y
Ethyl Acetate*	Not detected	750		ppbv	753	141-78-6	Y
4-Ethyltoluene	Not detected	200		ppbv	753	622-96-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S16982.03 (continued)
Sample Tag: SG-5

TO-15, Method: TO-15, Run Date: 08/28/20 18:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 113	Not detected	200		ppbv	753	76-13-1	Y
Freon 114	Not detected	200		ppbv	753	76-14-2	Y
Heptane	52,000	200		ppbv	753	142-82-5	Y
Hexachlorobutadiene	Not detected	200		ppbv	753	87-68-3	Y
Hexane	66,300	200		ppbv	753	110-54-3	Y
2-Hexanone*	Not detected	400		ppbv	753	591-78-6	Y
Isopropyl Alcohol*	Not detected	1,500		ppbv	753	67-63-0	Y
Methylene chloride	Not detected	400		ppbv	753	75-09-2	Y
2-Butanone (MEK)	Not detected	750		ppbv	753	78-93-3	Y
4-Methyl-2-pentanone (MIBK)	Not detected	400		ppbv	753	108-10-1	Y
tert-Methyl butyl ether (MTBE)	Not detected	200		ppbv	753	1634-04-4	Y
Methyl methacrylate	Not detected	200		ppbv	753	80-62-6	Y
Naphthalene	Not detected	200		ppbv	753	91-20-3	Y
Propylene*	Not detected	8,000		ppbv	753	115-07-1	Y
Styrene	Not detected	200		ppbv	753	100-42-5	Y
1,1,1-Trichloroethane	Not detected	200		ppbv	753	71-55-6	Y
1,1,2,2-Tetrachloroethane	Not detected	200		ppbv	753	79-34-5	Y
1,1,2-Trichloroethane	Not detected	200		ppbv	753	79-00-5	Y
1,2,4-Trichlorobenzene	Not detected	400		ppbv	753	120-82-1	Y
1,2,4-Trimethylbenzene	Not detected	200		ppbv	753	95-63-6	Y
1,3,5-Trimethylbenzene	Not detected	200		ppbv	753	108-67-8	Y
2,2,4-Trimethylpentane	45,900	200		ppbv	753	540-84-1	Y
Tert-butyl Alcohol	Not detected	750		ppbv	753	75-65-0	Y
Tetrachloroethene	Not detected	200		ppbv	753	127-18-4	Y
Tetrahydrofuran*	Not detected	200		ppbv	753	109-99-9	Y
Toluene	Not detected	200		ppbv	753	108-88-3	Y
Trichloroethene	Not detected	200		ppbv	753	79-01-6	Y
Trichlorofluoromethane	Not detected	200		ppbv	753	75-69-4	Y
Vinyl chloride	Not detected	200		ppbv	753	75-01-4	Y
Vinyl acetate	Not detected	200		ppbv	753	108-05-4	Y
p,m-Xylene	400	300		ppbv	753		Y
o-Xylene	Not detected	200		ppbv	753	95-47-6	Y
Total Xylenes	Not detected	500		ppbv	753	1330-20-7	Y

TO-15, Method: TO-15, Run Date: 08/28/20 18:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	3,600		ug/m3	753	67-64-1	Y
1,3-Butadiene	Not detected	440		ug/m3	753	106-99-0	Y
Benzene	Not detected	640		ug/m3	753	71-43-2	Y
Bromodichloromethane	Not detected	1,300		ug/m3	753	75-27-4	Y
Bromoform	Not detected	2,100		ug/m3	753	75-25-2	Y
Bromomethane	Not detected	780		ug/m3	753	74-83-9	Y
Vinyl bromide	Not detected	870		ug/m3	753	593-60-2	Y
Benzyl chloride	Not detected	1,000		ug/m3	753	100-44-7	Y
Carbon disulfide	Not detected	1,200		ug/m3	753	75-15-0	Y
Chlorobenzene	Not detected	920		ug/m3	753	108-90-7	Y
Chloroethane	Not detected	530		ug/m3	753	75-00-3	Y
Chloroform	Not detected	980		ug/m3	753	67-66-3	Y
Chloromethane	Not detected	410		ug/m3	753	74-87-3	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S16982.03 (continued)
Sample Tag: SG-5

TO-15, Method: TO-15, Run Date: 08/28/20 18:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
3-Chloropropene	Not detected	630		ug/m3	753	107-05-1	Y
2-Chlorotoluene	Not detected	1,000		ug/m3	753	95-49-8	Y
Carbon tetrachloride	Not detected	1,300		ug/m3	753	56-23-5	Y
Cyclohexane	125,000	690		ug/m3	753	110-82-7	Y
1,1-Dichloroethane	Not detected	810		ug/m3	753	75-34-3	Y
1,1-Dichloroethene	Not detected	790		ug/m3	753	75-35-4	Y
1,2-Dibromoethane	Not detected	1,500		ug/m3	753	106-93-4	Y
1,2-Dichloroethane	Not detected	810		ug/m3	753	107-06-2	Y
1,2-Dichloropropane	Not detected	920		ug/m3	753	78-87-5	Y
1,4-Dioxane	Not detected	6,800		ug/m3	753	123-91-1	Y
Dichlorodifluoromethane	Not detected	990		ug/m3	753	75-71-8	Y
Dibromochloromethane	Not detected	1,700		ug/m3	753	124-48-1	Y
trans-1,2-Dichloroethene	Not detected	790		ug/m3	753	156-60-5	Y
cis-1,2-Dichloroethene	Not detected	790		ug/m3	753	156-59-2	Y
cis-1,3-Dichloropropene	Not detected	910		ug/m3	753	10061-01-5	Y
1,3-Dichlorobenzene	Not detected	1,200		ug/m3	753	541-73-1	Y
1,2-Dichlorobenzene	Not detected	1,200		ug/m3	753	95-50-1	Y
1,4-Dichlorobenzene	Not detected	1,200		ug/m3	753	106-46-7	Y
trans-1,3-Dichloropropene	Not detected	910		ug/m3	753	10061-02-6	Y
Ethanol*	Not detected	3,600		ug/m3	753	64-17-5	Y
Ethylbenzene	13,000	870		ug/m3	753	100-41-4	Y
Ethyl Acetate*	Not detected	2,700		ug/m3	753	141-78-6	Y
4-Ethyltoluene	Not detected	980		ug/m3	753	622-96-8	Y
Freon 113	Not detected	1,500		ug/m3	753	76-13-1	Y
Freon 114	Not detected	1,400		ug/m3	753	76-14-2	Y
Heptane	210,000	820		ug/m3	753	142-82-5	Y
Hexachlorobutadiene	Not detected	2,100		ug/m3	753	87-68-3	Y
Hexane	234,000	700		ug/m3	753	110-54-3	Y
2-Hexanone*	Not detected	1,600		ug/m3	753	591-78-6	Y
Isopropyl Alcohol*	Not detected	3,700		ug/m3	753	67-63-0	Y
Methylene chloride	Not detected	1,400		ug/m3	753	75-09-2	Y
2-Butanone (MEK)	Not detected	2,200		ug/m3	753	78-93-3	Y
4-Methyl-2-pentanone (MIBK)	Not detected	1,600		ug/m3	753	108-10-1	Y
tert-Methyl butyl ether (MTBE)	Not detected	720		ug/m3	753	1634-04-4	Y
Methyl methacrylate	Not detected	820		ug/m3	753	80-62-6	Y
Naphthalene	Not detected	1,000		ug/m3	753	91-20-3	Y
Propylene*	Not detected	14,000		ug/m3	753	115-07-1	Y
Styrene	Not detected	850		ug/m3	753	100-42-5	Y
1,1,1-Trichloroethane	Not detected	1,100		ug/m3	753	71-55-6	Y
1,1,2,2-Tetrachloroethane	Not detected	1,400		ug/m3	753	79-34-5	Y
1,1,2-Trichloroethane	Not detected	1,100		ug/m3	753	79-00-5	Y
1,2,4-Trichlorobenzene	Not detected	3,000		ug/m3	753	120-82-1	Y
1,2,4-Trimethylbenzene	Not detected	980		ug/m3	753	95-63-6	Y
1,3,5-Trimethylbenzene	Not detected	980		ug/m3	753	108-67-8	Y
2,2,4-Trimethylpentane	214,000	930		ug/m3	753	540-84-1	Y
Tert-butyl Alcohol	Not detected	2,300		ug/m3	753	75-65-0	Y
Tetrachloroethene	Not detected	1,400		ug/m3	753	127-18-4	Y
Tetrahydrofuran*	Not detected	590		ug/m3	753	109-99-9	Y
Toluene	Not detected	750		ug/m3	753	108-88-3	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S16982.03 (continued)
Sample Tag: SG-5

TO-15, Method: TO-15, Run Date: 08/28/20 18:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Trichloroethene	Not detected	1,100		ug/m3	753	79-01-6	Y
Trichlorofluoromethane	Not detected	1,100		ug/m3	753	75-69-4	Y
Vinyl chloride	Not detected	510		ug/m3	753	75-01-4	Y
Vinyl acetate	Not detected	700		ug/m3	753	108-05-4	Y
p,m-Xylene	1,700	1,300		ug/m3	753		Y
o-Xylene	Not detected	870		ug/m3	753	95-47-6	Y
Total Xylenes	Not detected	2,200		ug/m3	753	1330-20-7	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID: S16982
Client: PME02 (PM Environmental, Inc. - Berkley)
Project: 01-12411-0-0001
Submitted: 08/27/2020 15:00 Login User: MMC

Attention: Jana Beumel
Address: PM Environmental, Inc.
4080 W. Eleven Mile
Berkley, MI 48072

Phone: O:248-336-9988 FAX:
Email: Beumel@pmenv.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	RT
02.	☐ Yes	☒ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☐ No	☒ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

A 4205

AIR/GAS SAMPLES CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Jana Beunel
COMPANY: PM Environmental
ADDRESS: 4080 W 11 mile Rd
CITY: Berkley STATE: MI ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:
EMAIL ADDRESS: Beunel@pmenv.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: EMAIL ADDRESS:

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: 01-12411-0-0001
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Ben Sin.

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

Certifications
☐ OHIO VAP ☐ NELAP
☐ DoD ☐ NPDES

MERIT LAB NO. FOR LAB USE ONLY	SAMPLE TAG IDENTIFICATION-DESCRIPTION	Start Date	Start Time	Stop Date	Stop Time	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	Sample Type: Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (specify in notes)	Analyses: TO-15	Other (specify in notes)
16982.01	SG-1	8/27	10:00	8/27	10:07	30	8	26	16826			X			X	
.02	SG-3		11:35		11:45	29	8	173	28924			X			X	
.03	SG-5		11:00		11:10	29	8	206	28912			X			X	

Temperature (Fahrenheit)	Interior	Ambient	Notes
Start	X	78°	
Stop		78°	

Pressure (inches of Hg)	Interior	Ambient	Notes
Start	X	30.15	
Stop		30.15	

Notes

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Ben Sin. PME ☒ Sampler DATE: 8/27 TIME: 13:30
RECEIVED BY: SIGNATURE/ORGANIZATION: PM Storage DATE: 8/27 TIME: 13:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 8-27-20 TIME: 1300

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: 8/27/20 TIME: 1500
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 8/27/2020 TIME: 1500

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

TEMP. ON ARRIVAL: RT

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 06/28/19

Analytical Laboratory Report

Report ID: S20267.01(03)
Generated on 12/29/2020

Report to

Attention: Jana Beumel
PM Environmental, Inc.
4080 W. Eleven Mile
Berkley, MI 48072

Phone: O:248-336-9988 D:248-414-1859 FAX:
Email: Beumel@pmenv.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S20267.01-S20267.34
Project: 01-12411-1-0001
Collected Date(s): 12/21/2020
Submitted Date/Time: 12/22/2020 12:15
Sampled by: Jana Beumel
P.O. #: 01-12411-1-0001

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM2540B	Standard Method 2540 B 2011
SW3546	SW 846 Method 3546 Revision 0 February 2007
SW5035A	SW 846 Method 5035A Revision 1 July 2002
SW5035A/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5035A Revision 1 July 2002
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (34 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S20267.01	SB-6 10-11	Soil	12/21/20 09:40
S20267.02	SB-6 14-15	Soil	12/21/20 09:45
S20267.03	SB-7 4-5	Soil	12/21/20 10:10
S20267.04	SB-7 7-8	Soil	12/21/20 10:15
S20267.05	SB-7 14-15	Soil	12/21/20 10:20
S20267.06	SB-8 4-5	Soil	12/21/20 11:10
S20267.07	SB-8 9-10	Soil	12/21/20 11:15
S20267.08	SB-8 14-15	Soil	12/21/20 11:20
S20267.09	SB-9 4-5	Soil	12/21/20 10:40
S20267.10	SB-9 10-11	Soil	12/21/20 10:45
S20267.11	SB-9 14-15	Soil	12/21/20 10:50
S20267.12	SB-10 6.5-7.5	Soil	12/21/20 13:35
S20267.13	SB-10 14-15	Soil	12/21/20 13:40
S20267.14	SB-11 3-4	Soil	12/21/20 14:50
S20267.15	SB-11 10-11	Soil	12/21/20 14:55
S20267.16	SB-11 19-20	Soil	12/21/20 15:00
S20267.17	SB-12 6-7	Soil	12/21/20 14:30
S20267.18	SB-12 10-11	Soil	12/21/20 14:35
S20267.19	SB-12 4-15	Soil	12/21/20 14:40
S20267.20	SB-13 4-5	Soil	12/21/20 14:00
S20267.21	SB-13 11-12	Soil	12/21/20 14:05
S20267.22	SB-13 14-15	Soil	12/21/20 14:10
S20267.23	SB-14 3-4	Soil	12/21/20 11:40
S20267.24	SB-14 9-10	Soil	12/21/20 11:45
S20267.25	SB-14 14-15	Soil	12/21/20 11:50
S20267.26	SB-15 3-4	Soil	12/21/20 12:10
S20267.27	SB-15 6-7	Soil	12/21/20 12:15
S20267.28	SB-15 14-15	Soil	12/21/20 12:20
S20267.29	SB-16 4-5	Soil	12/21/20 13:15
S20267.30	SB-16 9-10	Soil	12/21/20 13:20
S20267.31	SB-16 14-15	Soil	12/21/20 13:25
S20267.32	SB-17 5-6	Soil	12/21/20 12:45
S20267.33	SB-17 9-10	Soil	12/21/20 12:50
S20267.34	SB-17 14-15	Soil	12/21/20 12:55

Lab Sample ID: S20267.01
Sample Tag: SB-6 10-11
Collected Date/Time: 12/21/2020 09:40
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	9.256/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	83	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 18:21, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 03:42, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	75.3	60-29-7	
Acetone	Not detected	2,000		ug/kg	75.3	67-64-1	
Methyl iodide	Not detected	200		ug/kg	75.3	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	75.3	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	75.3	1634-04-4	
Acrylonitrile	Not detected	200		ug/kg	75.3	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	75.3	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	75.3	75-71-8	
Chloromethane	Not detected	400		ug/kg	75.3	74-87-3	

Lab Sample ID: S20267.01 (continued)
Sample Tag: SB-6 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 03:42, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	80		ug/kg	75.3	75-01-4	
Bromomethane	Not detected	300		ug/kg	75.3	74-83-9	
Chloroethane	Not detected	400		ug/kg	75.3	75-00-3	
Trichlorofluoromethane	Not detected	200		ug/kg	75.3	75-69-4	
1,1-Dichloroethene	Not detected	80		ug/kg	75.3	75-35-4	
Methylene chloride	Not detected	200		ug/kg	75.3	75-09-2	
trans-1,2-Dichloroethene	Not detected	80		ug/kg	75.3	156-60-5	
1,1-Dichloroethane	Not detected	80		ug/kg	75.3	75-34-3	
cis-1,2-Dichloroethene	Not detected	80		ug/kg	75.3	156-59-2	
Tetrahydrofuran*	Not detected	2,000		ug/kg	75.3	109-99-9	
Chloroform	Not detected	80		ug/kg	75.3	67-66-3	
Bromochloromethane	Not detected	200		ug/kg	75.3	74-97-5	
1,1,1-Trichloroethane	Not detected	80		ug/kg	75.3	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	75.3	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	75.3	591-78-6	
Carbon tetrachloride	Not detected	80		ug/kg	75.3	56-23-5	
Benzene	Not detected	80		ug/kg	75.3	71-43-2	
1,2-Dichloroethane	Not detected	80		ug/kg	75.3	107-06-2	
Trichloroethene	Not detected	80		ug/kg	75.3	79-01-6	
1,2-Dichloropropane	Not detected	80		ug/kg	75.3	78-87-5	
Bromodichloromethane	Not detected	200		ug/kg	75.3	75-27-4	
Dibromomethane	Not detected	400		ug/kg	75.3	74-95-3	
cis-1,3-Dichloropropene	Not detected	80		ug/kg	75.3	10061-01-5	
Toluene	Not detected	80		ug/kg	75.3	108-88-3	
trans-1,3-Dichloropropene	Not detected	80		ug/kg	75.3	10061-02-6	
1,1,2-Trichloroethane	Not detected	80		ug/kg	75.3	79-00-5	
Tetrachloroethene	Not detected	80		ug/kg	75.3	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	80		ug/kg	75.3	110-57-6	
Dibromochloromethane	Not detected	200		ug/kg	75.3	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	75.3	106-93-4	M
Chlorobenzene	Not detected	80		ug/kg	75.3	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	200		ug/kg	75.3	630-20-6	
Ethylbenzene	Not detected	80		ug/kg	75.3	100-41-4	
p,m-Xylene	Not detected	200		ug/kg	75.3		
o-Xylene	Not detected	80		ug/kg	75.3	95-47-6	
Styrene	Not detected	80		ug/kg	75.3	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	75.3	98-82-8	
Bromoform	Not detected	200		ug/kg	75.3	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	80		ug/kg	75.3	79-34-5	
1,2,3-Trichloropropane	Not detected	200		ug/kg	75.3	96-18-4	
n-Propylbenzene	Not detected	80		ug/kg	75.3	103-65-1	
Bromobenzene	Not detected	200		ug/kg	75.3	108-86-1	
1,3,5-Trimethylbenzene	Not detected	80		ug/kg	75.3	108-67-8	
tert-Butylbenzene	Not detected	80		ug/kg	75.3	98-06-6	
1,2,4-Trimethylbenzene	Not detected	80		ug/kg	75.3	95-63-6	
sec-Butylbenzene	Not detected	80		ug/kg	75.3	135-98-8	
p-Isopropyltoluene	Not detected	200		ug/kg	75.3	99-87-6	
1,3-Dichlorobenzene	Not detected	200		ug/kg	75.3	541-73-1	
1,4-Dichlorobenzene	Not detected	200		ug/kg	75.3	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.01 (continued)
Sample Tag: SB-6 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 03:42, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	200		ug/kg	75.3	95-50-1	
1,2,3-Trimethylbenzene	Not detected	80		ug/kg	75.3	526-73-8	
n-Butylbenzene	Not detected	80		ug/kg	75.3	104-51-8	
Hexachloroethane	Not detected	500		ug/kg	75.3	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	75.3	96-12-8	
1,2,4-Trichlorobenzene	Not detected	500		ug/kg	75.3	120-82-1	
1,2,3-Trichlorobenzene	Not detected	500		ug/kg	75.3	87-61-6	
Naphthalene	Not detected	400		ug/kg	75.3	91-20-3	
2-Methylnaphthalene	Not detected	200		ug/kg	75.3	91-57-6	

Lab Sample ID: S20267.02
Sample Tag: SB-6 14-15
Collected Date/Time: 12/21/2020 09:45
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Lab Sample ID: S20267.03
Sample Tag: SB-7 4-5
Collected Date/Time: 12/21/2020 10:10
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	10.948/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	78	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 18:39, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	300	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	3,200	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	6,100	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 08:15, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10,000		ug/kg	3630	60-29-7	Y
Acetone	Not detected	70,000		ug/kg	3630	67-64-1	Y
Methyl iodide	Not detected	7,000		ug/kg	3630	74-88-4	Y
Carbon disulfide	Not detected	20,000		ug/kg	3630	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	10,000		ug/kg	3630	1634-04-4	Y
Acrylonitrile	Not detected	7,000		ug/kg	3630	107-13-1	Y
2-Butanone (MEK)	Not detected	54,000		ug/kg	3630	78-93-3	Y
Dichlorodifluoromethane	Not detected	20,000		ug/kg	3630	75-71-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S20267.03 (continued)
Sample Tag: SB-7 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 08:15, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	20,000		ug/kg	3630	74-87-3	Y
Vinyl chloride	Not detected	4,000		ug/kg	3630	75-01-4	Y
Bromomethane	Not detected	10,000		ug/kg	3630	74-83-9	Y
Chloroethane	Not detected	20,000		ug/kg	3630	75-00-3	Y
Trichlorofluoromethane	Not detected	7,000		ug/kg	3630	75-69-4	Y
1,1-Dichloroethene	Not detected	4,000		ug/kg	3630	75-35-4	Y
Methylene chloride	Not detected	7,000		ug/kg	3630	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	4,000		ug/kg	3630	156-60-5	Y
1,1-Dichloroethane	Not detected	4,000		ug/kg	3630	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	4,000		ug/kg	3630	156-59-2	Y
Tetrahydrofuran*	Not detected	70,000		ug/kg	3630	109-99-9	Y
Chloroform	Not detected	4,000		ug/kg	3630	67-66-3	Y
Bromochloromethane	Not detected	7,000		ug/kg	3630	74-97-5	Y
1,1,1-Trichloroethane	Not detected	4,000		ug/kg	3630	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	200,000		ug/kg	3630	108-10-1	Y
2-Hexanone	Not detected	200,000		ug/kg	3630	591-78-6	Y
Carbon tetrachloride	Not detected	4,000		ug/kg	3630	56-23-5	Y
Benzene	Not detected	4,000		ug/kg	3630	71-43-2	Y
1,2-Dichloroethane	Not detected	4,000		ug/kg	3630	107-06-2	Y
Trichloroethene	Not detected	4,000		ug/kg	3630	79-01-6	Y
1,2-Dichloropropane	Not detected	4,000		ug/kg	3630	78-87-5	Y
Bromodichloromethane	Not detected	7,000		ug/kg	3630	75-27-4	Y
Dibromomethane	Not detected	20,000		ug/kg	3630	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	4,000		ug/kg	3630	10061-01-5	Y
Toluene	Not detected	4,000		ug/kg	3630	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	4,000		ug/kg	3630	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	4,000		ug/kg	3630	79-00-5	Y
Tetrachloroethene	Not detected	4,000		ug/kg	3630	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	4,000		ug/kg	3630	110-57-6	Y
Dibromochloromethane	Not detected	7,000		ug/kg	3630	124-48-1	Y
1,2-Dibromoethane	Not detected	1,000		ug/kg	3630	106-93-4	MY
Chlorobenzene	Not detected	4,000		ug/kg	3630	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	7,000		ug/kg	3630	630-20-6	Y
Ethylbenzene	36,000	4,000		ug/kg	3630	100-41-4	Y
p,m-Xylene	Not detected	7,000		ug/kg	3630		Y
o-Xylene	Not detected	4,000		ug/kg	3630	95-47-6	Y
Styrene	Not detected	4,000		ug/kg	3630	100-42-5	Y
Isopropylbenzene	20,000	20,000		ug/kg	3630	98-82-8	Y
Bromoform	Not detected	7,000		ug/kg	3630	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	4,000		ug/kg	3630	79-34-5	Y
1,2,3-Trichloropropane	Not detected	7,000		ug/kg	3630	96-18-4	Y
n-Propylbenzene	88,000	4,000		ug/kg	3630	103-65-1	Y
Bromobenzene	Not detected	7,000		ug/kg	3630	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	4,000		ug/kg	3630	108-67-8	Y
tert-Butylbenzene	Not detected	4,000		ug/kg	3630	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	4,000		ug/kg	3630	95-63-6	Y
sec-Butylbenzene	16,000	4,000		ug/kg	3630	135-98-8	Y
p-Isopropyltoluene	Not detected	7,000		ug/kg	3630	99-87-6	Y

Y-Elevated reporting limit due to high target concentration
M-Result reported to MDL not RDL

Lab Sample ID: S20267.03 (continued)

Sample Tag: SB-7 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 08:15, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,3-Dichlorobenzene	Not detected	7,000		ug/kg	3630	541-73-1	Y
1,4-Dichlorobenzene	Not detected	7,000		ug/kg	3630	106-46-7	Y
1,2-Dichlorobenzene	Not detected	7,000		ug/kg	3630	95-50-1	Y
1,2,3-Trimethylbenzene	5,000	4,000		ug/kg	3630	526-73-8	Y
n-Butylbenzene	38,000	4,000		ug/kg	3630	104-51-8	Y
Hexachloroethane	Not detected	20,000		ug/kg	3630	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	20,000		ug/kg	3630	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	24,000		ug/kg	3630	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	24,000		ug/kg	3630	87-61-6	Y
Naphthalene	20,000	20,000		ug/kg	3630	91-20-3	Y
2-Methylnaphthalene	45,000	7,000		ug/kg	3630	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S20267.04
Sample Tag: SB-7 7-8
Collected Date/Time: 12/21/2020 10:15
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Lab Sample ID: S20267.05
Sample Tag: SB-7 14-15
Collected Date/Time: 12/21/2020 10:20
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	12.257/12	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	86	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 18:57, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:04, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	65.1	60-29-7	
Acetone	Not detected	1,000		ug/kg	65.1	67-64-1	
Methyl iodide	Not detected	100		ug/kg	65.1	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	65.1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	65.1	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	65.1	107-13-1	
2-Butanone (MEK)	Not detected	980		ug/kg	65.1	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	65.1	75-71-8	
Chloromethane	Not detected	300		ug/kg	65.1	74-87-3	

Lab Sample ID: S20267.05 (continued)
Sample Tag: SB-7 14-15

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:04, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	65.1	75-01-4	
Bromomethane	Not detected	300		ug/kg	65.1	74-83-9	
Chloroethane	Not detected	300		ug/kg	65.1	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	65.1	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	65.1	75-35-4	
Methylene chloride	Not detected	100		ug/kg	65.1	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	65.1	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	65.1	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	65.1	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	65.1	109-99-9	
Chloroform	Not detected	70		ug/kg	65.1	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	65.1	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	65.1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	65.1	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	65.1	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	65.1	56-23-5	
Benzene	Not detected	70		ug/kg	65.1	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	65.1	107-06-2	
Trichloroethene	Not detected	70		ug/kg	65.1	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	65.1	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	65.1	75-27-4	
Dibromomethane	Not detected	300		ug/kg	65.1	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	65.1	10061-01-5	
Toluene	Not detected	70		ug/kg	65.1	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	65.1	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	65.1	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	65.1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	65.1	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	65.1	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	65.1	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	65.1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	65.1	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	65.1	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	65.1		
o-Xylene	Not detected	70		ug/kg	65.1	95-47-6	
Styrene	Not detected	70		ug/kg	65.1	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	65.1	98-82-8	
Bromoform	Not detected	100		ug/kg	65.1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	65.1	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	65.1	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	65.1	103-65-1	
Bromobenzene	Not detected	100		ug/kg	65.1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	65.1	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	65.1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	65.1	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	65.1	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	65.1	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	65.1	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	65.1	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.05 (continued)
Sample Tag: SB-7 14-15

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:04, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	65.1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	65.1	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	65.1	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	65.1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	65.1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	430		ug/kg	65.1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	430		ug/kg	65.1	87-61-6	
Naphthalene	Not detected	300		ug/kg	65.1	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	65.1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.06
Sample Tag: SB-8 4-5
Collected Date/Time: 12/21/2020 11:10
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	11.161/11	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	82	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 19:15, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:27, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	71.1	60-29-7	
Acetone	Not detected	1,000		ug/kg	71.1	67-64-1	
Methyl iodide	Not detected	100		ug/kg	71.1	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	71.1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	71.1	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	71.1	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	71.1	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	71.1	75-71-8	
Chloromethane	Not detected	400		ug/kg	71.1	74-87-3	

Lab Sample ID: S20267.06 (continued)
Sample Tag: SB-8 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:27, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	71.1	75-01-4	
Bromomethane	Not detected	300		ug/kg	71.1	74-83-9	
Chloroethane	Not detected	400		ug/kg	71.1	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	71.1	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	71.1	75-35-4	
Methylene chloride	Not detected	100		ug/kg	71.1	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	71.1	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	71.1	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	71.1	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	71.1	109-99-9	
Chloroform	Not detected	70		ug/kg	71.1	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	71.1	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	71.1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	71.1	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	71.1	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	71.1	56-23-5	
Benzene	Not detected	70		ug/kg	71.1	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	71.1	107-06-2	
Trichloroethene	Not detected	70		ug/kg	71.1	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	71.1	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	71.1	75-27-4	
Dibromomethane	Not detected	400		ug/kg	71.1	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	71.1	10061-01-5	
Toluene	Not detected	70		ug/kg	71.1	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	71.1	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	71.1	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	71.1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	71.1	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	71.1	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	71.1	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	71.1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	71.1	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	71.1	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	71.1		
o-Xylene	Not detected	70		ug/kg	71.1	95-47-6	
Styrene	Not detected	70		ug/kg	71.1	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	71.1	98-82-8	
Bromoform	Not detected	100		ug/kg	71.1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	71.1	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	71.1	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	71.1	103-65-1	
Bromobenzene	Not detected	100		ug/kg	71.1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	71.1	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	71.1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	71.1	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	71.1	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	71.1	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	71.1	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	71.1	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.06 (continued)
Sample Tag: SB-8 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:27, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	71.1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	71.1	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	71.1	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	71.1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	71.1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	470		ug/kg	71.1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	470		ug/kg	71.1	87-61-6	
Naphthalene	Not detected	400		ug/kg	71.1	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	71.1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.07
Sample Tag: SB-8 9-10
Collected Date/Time: 12/21/2020 11:15
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	9.649/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	85	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 19:33, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:50, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	69.8	60-29-7	
Acetone	Not detected	1,000		ug/kg	69.8	67-64-1	
Methyl iodide	Not detected	100		ug/kg	69.8	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	69.8	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	69.8	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	69.8	107-13-1	
2-Butanone (MEK)	Not detected	1,000		ug/kg	69.8	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	69.8	75-71-8	
Chloromethane	Not detected	300		ug/kg	69.8	74-87-3	

Lab Sample ID: S20267.07 (continued)
Sample Tag: SB-8 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:50, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	69.8	75-01-4	
Bromomethane	Not detected	300		ug/kg	69.8	74-83-9	
Chloroethane	Not detected	300		ug/kg	69.8	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	69.8	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	69.8	75-35-4	
Methylene chloride	Not detected	100		ug/kg	69.8	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	69.8	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	69.8	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	69.8	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	69.8	109-99-9	
Chloroform	Not detected	70		ug/kg	69.8	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	69.8	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	69.8	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	69.8	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	69.8	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	69.8	56-23-5	
Benzene	Not detected	70		ug/kg	69.8	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	69.8	107-06-2	
Trichloroethene	Not detected	70		ug/kg	69.8	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	69.8	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	69.8	75-27-4	
Dibromomethane	Not detected	300		ug/kg	69.8	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	69.8	10061-01-5	
Toluene	Not detected	70		ug/kg	69.8	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	69.8	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	69.8	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	69.8	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	69.8	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	69.8	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	69.8	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	69.8	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	69.8	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	69.8	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	69.8		
o-Xylene	Not detected	70		ug/kg	69.8	95-47-6	
Styrene	Not detected	70		ug/kg	69.8	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	69.8	98-82-8	
Bromoform	Not detected	100		ug/kg	69.8	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	69.8	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	69.8	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	69.8	103-65-1	
Bromobenzene	Not detected	100		ug/kg	69.8	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	69.8	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	69.8	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	69.8	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	69.8	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	69.8	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	69.8	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	69.8	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.07 (continued)

Sample Tag: SB-8 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 04:50, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	69.8	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	69.8	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	69.8	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	69.8	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	69.8	96-12-8	
1,2,4-Trichlorobenzene	Not detected	460		ug/kg	69.8	120-82-1	
1,2,3-Trichlorobenzene	Not detected	460		ug/kg	69.8	87-61-6	
Naphthalene	Not detected	300		ug/kg	69.8	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	69.8	91-57-6	

Lab Sample ID: S20267.08
Sample Tag: SB-8 14-15
Collected Date/Time: 12/21/2020 11:20
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Lab Sample ID: S20267.09
Sample Tag: SB-9 4-5
Collected Date/Time: 12/21/2020 10:40
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	9.498/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	74	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 19:52, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	4,800	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	7,900	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 18:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	4,000		ug/kg	887	60-29-7	Y
Acetone	Not detected	20,000		ug/kg	887	67-64-1	Y
Methyl iodide	Not detected	2,000		ug/kg	887	74-88-4	Y
Carbon disulfide	Not detected	4,000		ug/kg	887	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	4,000		ug/kg	887	1634-04-4	Y
Acrylonitrile	Not detected	2,000		ug/kg	887	107-13-1	Y
2-Butanone (MEK)	Not detected	13,000		ug/kg	887	78-93-3	Y
Dichlorodifluoromethane	Not detected	4,000		ug/kg	887	75-71-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S20267.09 (continued)
Sample Tag: SB-9 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 18:25, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	4,000		ug/kg	887	74-87-3	Y
Vinyl chloride	Not detected	900		ug/kg	887	75-01-4	Y
Bromomethane	Not detected	4,000		ug/kg	887	74-83-9	Y
Chloroethane	Not detected	4,000		ug/kg	887	75-00-3	Y
Trichlorofluoromethane	Not detected	2,000		ug/kg	887	75-69-4	Y
1,1-Dichloroethene	Not detected	900		ug/kg	887	75-35-4	Y
Methylene chloride	Not detected	2,000		ug/kg	887	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	900		ug/kg	887	156-60-5	Y
1,1-Dichloroethane	Not detected	900		ug/kg	887	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	900		ug/kg	887	156-59-2	Y
Tetrahydrofuran*	Not detected	20,000		ug/kg	887	109-99-9	Y
Chloroform	Not detected	900		ug/kg	887	67-66-3	Y
Bromochloromethane	Not detected	2,000		ug/kg	887	74-97-5	Y
1,1,1-Trichloroethane	Not detected	900		ug/kg	887	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	40,000		ug/kg	887	108-10-1	Y
2-Hexanone	Not detected	40,000		ug/kg	887	591-78-6	Y
Carbon tetrachloride	Not detected	900		ug/kg	887	56-23-5	Y
Benzene	Not detected	900		ug/kg	887	71-43-2	Y
1,2-Dichloroethane	Not detected	900		ug/kg	887	107-06-2	Y
Trichloroethene	Not detected	900		ug/kg	887	79-01-6	Y
1,2-Dichloropropane	Not detected	900		ug/kg	887	78-87-5	Y
Bromodichloromethane	Not detected	2,000		ug/kg	887	75-27-4	Y
Dibromomethane	Not detected	4,000		ug/kg	887	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	900		ug/kg	887	10061-01-5	Y
Toluene	Not detected	900		ug/kg	887	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	900		ug/kg	887	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	900		ug/kg	887	79-00-5	Y
Tetrachloroethene	Not detected	900		ug/kg	887	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	900		ug/kg	887	110-57-6	Y
Dibromochloromethane	Not detected	2,000		ug/kg	887	124-48-1	Y
1,2-Dibromoethane	Not detected	400		ug/kg	887	106-93-4	YM
Chlorobenzene	Not detected	900		ug/kg	887	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	2,000		ug/kg	887	630-20-6	Y
Ethylbenzene	1,700	900		ug/kg	887	100-41-4	Y
p,m-Xylene	2,000	2,000		ug/kg	887		Y
o-Xylene	Not detected	900		ug/kg	887	95-47-6	Y
Styrene	Not detected	900		ug/kg	887	100-42-5	Y
Isopropylbenzene	7,000	4,000		ug/kg	887	98-82-8	Y
Bromoform	Not detected	2,000		ug/kg	887	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	900		ug/kg	887	79-34-5	Y
1,2,3-Trichloropropane	Not detected	2,000		ug/kg	887	96-18-4	Y
n-Propylbenzene	29,900	900		ug/kg	887	103-65-1	Y
Bromobenzene	Not detected	2,000		ug/kg	887	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	900		ug/kg	887	108-67-8	Y
tert-Butylbenzene	Not detected	900		ug/kg	887	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	900		ug/kg	887	95-63-6	Y
sec-Butylbenzene	4,500	900		ug/kg	887	135-98-8	Y
p-Isopropyltoluene	Not detected	2,000		ug/kg	887	99-87-6	Y

Y-Elevated reporting limit due to high target concentration
M-Result reported to MDL not RDL

Lab Sample ID: S20267.09 (continued)

Sample Tag: SB-9 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 18:25, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,3-Dichlorobenzene	Not detected	2,000		ug/kg	887	541-73-1	Y
1,4-Dichlorobenzene	Not detected	2,000		ug/kg	887	106-46-7	Y
1,2-Dichlorobenzene	Not detected	2,000		ug/kg	887	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	900		ug/kg	887	526-73-8	Y
n-Butylbenzene	13,800	900		ug/kg	887	104-51-8	Y
Hexachloroethane	Not detected	5,000		ug/kg	887	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	4,000		ug/kg	887	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	5,900		ug/kg	887	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	5,900		ug/kg	887	87-61-6	Y
Naphthalene	14,000	4,000		ug/kg	887	91-20-3	Y
2-Methylnaphthalene	22,000	2,000		ug/kg	887	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S20267.10
Sample Tag: SB-9 10-11
Collected Date/Time: 12/21/2020 10:45
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	9.981/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	86	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 20:10, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:12, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	66.4	60-29-7	
Acetone	Not detected	1,000		ug/kg	66.4	67-64-1	
Methyl iodide	Not detected	100		ug/kg	66.4	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	66.4	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	66.4	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	66.4	107-13-1	
2-Butanone (MEK)	Not detected	1,000		ug/kg	66.4	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	66.4	75-71-8	
Chloromethane	Not detected	300		ug/kg	66.4	74-87-3	

Lab Sample ID: S20267.10 (continued)
Sample Tag: SB-9 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:12, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	66.4	75-01-4	
Bromomethane	Not detected	300		ug/kg	66.4	74-83-9	
Chloroethane	Not detected	300		ug/kg	66.4	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	66.4	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	66.4	75-35-4	
Methylene chloride	Not detected	100		ug/kg	66.4	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	66.4	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	66.4	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	66.4	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	66.4	109-99-9	
Chloroform	Not detected	70		ug/kg	66.4	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	66.4	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	66.4	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	66.4	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	66.4	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	66.4	56-23-5	
Benzene	Not detected	70		ug/kg	66.4	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	66.4	107-06-2	
Trichloroethene	Not detected	70		ug/kg	66.4	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	66.4	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	66.4	75-27-4	
Dibromomethane	Not detected	300		ug/kg	66.4	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	66.4	10061-01-5	
Toluene	Not detected	70		ug/kg	66.4	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	66.4	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	66.4	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	66.4	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	66.4	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	66.4	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	66.4	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	66.4	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	66.4	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	66.4	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	66.4		
o-Xylene	Not detected	70		ug/kg	66.4	95-47-6	
Styrene	Not detected	70		ug/kg	66.4	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	66.4	98-82-8	
Bromoform	Not detected	100		ug/kg	66.4	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	66.4	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	66.4	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	66.4	103-65-1	
Bromobenzene	Not detected	100		ug/kg	66.4	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	66.4	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	66.4	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	66.4	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	66.4	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	66.4	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	66.4	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	66.4	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.10 (continued)
Sample Tag: SB-9 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:12, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	66.4	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	66.4	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	66.4	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	66.4	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	66.4	96-12-8	
1,2,4-Trichlorobenzene	Not detected	440		ug/kg	66.4	120-82-1	
1,2,3-Trichlorobenzene	Not detected	440		ug/kg	66.4	87-61-6	
Naphthalene	Not detected	300		ug/kg	66.4	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	66.4	91-57-6	

Lab Sample ID: S20267.11
Sample Tag: SB-9 14-15
Collected Date/Time: 12/21/2020 10:50
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Analytical Laboratory Report

Lab Sample ID: S20267.12
Sample Tag: SB-10 6.5-7.5
Collected Date/Time: 12/21/2020 13:35
Matrix: Soil
COC Reference: 130925

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	12.421/12	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	81	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 20:28, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	71.4	60-29-7	
Acetone	Not detected	1,000		ug/kg	71.4	67-64-1	
Methyl iodide	Not detected	100		ug/kg	71.4	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	71.4	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	71.4	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	71.4	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	71.4	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	71.4	75-71-8	
Chloromethane	Not detected	400		ug/kg	71.4	74-87-3	

Lab Sample ID: S20267.12 (continued)
Sample Tag: SB-10 6.5-7.5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:35, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	71.4	75-01-4	
Bromomethane	Not detected	300		ug/kg	71.4	74-83-9	
Chloroethane	Not detected	400		ug/kg	71.4	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	71.4	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	71.4	75-35-4	
Methylene chloride	Not detected	100		ug/kg	71.4	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	71.4	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	71.4	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	71.4	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	71.4	109-99-9	
Chloroform	Not detected	70		ug/kg	71.4	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	71.4	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	71.4	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	71.4	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	71.4	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	71.4	56-23-5	
Benzene	Not detected	70		ug/kg	71.4	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	71.4	107-06-2	
Trichloroethene	Not detected	70		ug/kg	71.4	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	71.4	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	71.4	75-27-4	
Dibromomethane	Not detected	400		ug/kg	71.4	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	71.4	10061-01-5	
Toluene	Not detected	70		ug/kg	71.4	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	71.4	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	71.4	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	71.4	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	71.4	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	71.4	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	71.4	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	71.4	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	71.4	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	71.4	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	71.4		
o-Xylene	Not detected	70		ug/kg	71.4	95-47-6	
Styrene	Not detected	70		ug/kg	71.4	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	71.4	98-82-8	
Bromoform	Not detected	100		ug/kg	71.4	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	71.4	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	71.4	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	71.4	103-65-1	
Bromobenzene	Not detected	100		ug/kg	71.4	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	71.4	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	71.4	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	71.4	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	71.4	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	71.4	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	71.4	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	71.4	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.12 (continued)
Sample Tag: SB-10 6.5-7.5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:35, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	71.4	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	71.4	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	71.4	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	71.4	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	71.4	96-12-8	
1,2,4-Trichlorobenzene	Not detected	470		ug/kg	71.4	120-82-1	
1,2,3-Trichlorobenzene	Not detected	470		ug/kg	71.4	87-61-6	
Naphthalene	Not detected	400		ug/kg	71.4	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	71.4	91-57-6	

Lab Sample ID: S20267.13
Sample Tag: SB-10 14-15
Collected Date/Time: 12/21/2020 13:40
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	9.326/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	83	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 20:46, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	7	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	7	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	Not detected	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	Not detected	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	Not detected	300		ug/kg	7	85-01-8	
Pyrene	Not detected	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:58, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	74.8	60-29-7	
Acetone	Not detected	1,000		ug/kg	74.8	67-64-1	
Methyl iodide	Not detected	100		ug/kg	74.8	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	74.8	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	74.8	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	74.8	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	74.8	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	74.8	75-71-8	
Chloromethane	Not detected	400		ug/kg	74.8	74-87-3	

Lab Sample ID: S20267.13 (continued)
Sample Tag: SB-10 14-15

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:58, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	74.8	75-01-4	
Bromomethane	Not detected	300		ug/kg	74.8	74-83-9	
Chloroethane	Not detected	400		ug/kg	74.8	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	74.8	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	74.8	75-35-4	
Methylene chloride	Not detected	100		ug/kg	74.8	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	74.8	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	74.8	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	74.8	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	74.8	109-99-9	
Chloroform	Not detected	70		ug/kg	74.8	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	74.8	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	74.8	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	74.8	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	74.8	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	74.8	56-23-5	
Benzene	Not detected	70		ug/kg	74.8	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	74.8	107-06-2	
Trichloroethene	Not detected	70		ug/kg	74.8	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	74.8	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	74.8	75-27-4	
Dibromomethane	Not detected	400		ug/kg	74.8	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	74.8	10061-01-5	
Toluene	Not detected	70		ug/kg	74.8	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	74.8	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	74.8	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	74.8	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	74.8	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	74.8	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	74.8	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	74.8	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	74.8	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	74.8	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	74.8		
o-Xylene	Not detected	70		ug/kg	74.8	95-47-6	
Styrene	Not detected	70		ug/kg	74.8	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	74.8	98-82-8	
Bromoform	Not detected	100		ug/kg	74.8	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	74.8	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	74.8	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	74.8	103-65-1	
Bromobenzene	Not detected	100		ug/kg	74.8	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	74.8	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	74.8	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	74.8	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	74.8	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	74.8	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	74.8	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	74.8	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.13 (continued)

Sample Tag: SB-10 14-15

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 05:58, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	74.8	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	74.8	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	74.8	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	74.8	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	74.8	96-12-8	
1,2,4-Trichlorobenzene	Not detected	490		ug/kg	74.8	120-82-1	
1,2,3-Trichlorobenzene	Not detected	490		ug/kg	74.8	87-61-6	
Naphthalene	Not detected	400		ug/kg	74.8	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	74.8	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.14
Sample Tag: SB-11 3-4
Collected Date/Time: 12/21/2020 14:50
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 10:46	PTW	
Sample wt. (g) / Methanol (ml)*	11.075/11	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	83	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/28/20 21:04, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	7	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	7	208-96-8	
Anthracene	Not detected	300		ug/kg	7	120-12-7	
Benzo(a)anthracene	300	300		ug/kg	7	56-55-3	
Benzo(a)pyrene	300	300		ug/kg	7	50-32-8	
Benzo(b)fluoranthene	500	300		ug/kg	7	205-99-2	p
Benzo(k)fluoranthene	500	300		ug/kg	7	207-08-9	p
Benzo(ghi)perylene	Not detected	300		ug/kg	7	191-24-2	
Chrysene	300	300		ug/kg	7	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	7	53-70-3	
Fluoranthene	600	300		ug/kg	7	206-44-0	
Fluorene	Not detected	300		ug/kg	7	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	7	193-39-5	
Naphthalene	Not detected	300		ug/kg	7	91-20-3	
Phenanthrene	400	300		ug/kg	7	85-01-8	
Pyrene	500	300		ug/kg	7	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	7	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 06:20, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	70.1	60-29-7	
Acetone	Not detected	1,000		ug/kg	70.1	67-64-1	
Methyl iodide	Not detected	100		ug/kg	70.1	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	70.1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	70.1	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	70.1	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	70.1	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	70.1	75-71-8	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.

Lab Sample ID: S20267.14 (continued)
Sample Tag: SB-11 3-4

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 06:20, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	400		ug/kg	70.1	74-87-3	
Vinyl chloride	Not detected	70		ug/kg	70.1	75-01-4	
Bromomethane	Not detected	300		ug/kg	70.1	74-83-9	
Chloroethane	Not detected	400		ug/kg	70.1	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	70.1	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	70.1	75-35-4	
Methylene chloride	Not detected	100		ug/kg	70.1	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	70.1	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	70.1	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	70.1	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	70.1	109-99-9	
Chloroform	Not detected	70		ug/kg	70.1	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	70.1	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	70.1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	70.1	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	70.1	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	70.1	56-23-5	
Benzene	Not detected	70		ug/kg	70.1	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	70.1	107-06-2	
Trichloroethene	Not detected	70		ug/kg	70.1	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	70.1	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	70.1	75-27-4	
Dibromomethane	Not detected	400		ug/kg	70.1	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	70.1	10061-01-5	
Toluene	Not detected	70		ug/kg	70.1	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	70.1	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	70.1	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	70.1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	70.1	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	70.1	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	70.1	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	70.1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	70.1	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	70.1	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	70.1		
o-Xylene	Not detected	70		ug/kg	70.1	95-47-6	
Styrene	Not detected	70		ug/kg	70.1	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	70.1	98-82-8	
Bromoform	Not detected	100		ug/kg	70.1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	70.1	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	70.1	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	70.1	103-65-1	
Bromobenzene	Not detected	100		ug/kg	70.1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	70.1	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	70.1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	70.1	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	70.1	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	70.1	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	70.1	541-73-1	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.14 (continued)
Sample Tag: SB-11 3-4

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 06:20, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dichlorobenzene	Not detected	100		ug/kg	70.1	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	70.1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	70.1	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	70.1	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	70.1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	70.1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	460		ug/kg	70.1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	460		ug/kg	70.1	87-61-6	
Naphthalene	Not detected	400		ug/kg	70.1	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	70.1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.15
Sample Tag: SB-11 10-11
Collected Date/Time: 12/21/2020 14:55
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	10.704/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	81	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 10:55, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 06:43, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	69.4	60-29-7	
Acetone	Not detected	1,000		ug/kg	69.4	67-64-1	
Methyl iodide	Not detected	100		ug/kg	69.4	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	69.4	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	69.4	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	69.4	107-13-1	
2-Butanone (MEK)	Not detected	1,000		ug/kg	69.4	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	69.4	75-71-8	
Chloromethane	Not detected	300		ug/kg	69.4	74-87-3	

Lab Sample ID: S20267.15 (continued)
Sample Tag: SB-11 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 06:43, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	69.4	75-01-4	
Bromomethane	Not detected	300		ug/kg	69.4	74-83-9	
Chloroethane	Not detected	300		ug/kg	69.4	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	69.4	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	69.4	75-35-4	
Methylene chloride	Not detected	100		ug/kg	69.4	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	69.4	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	69.4	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	69.4	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	69.4	109-99-9	
Chloroform	Not detected	70		ug/kg	69.4	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	69.4	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	69.4	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	69.4	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	69.4	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	69.4	56-23-5	
Benzene	Not detected	70		ug/kg	69.4	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	69.4	107-06-2	
Trichloroethene	Not detected	70		ug/kg	69.4	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	69.4	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	69.4	75-27-4	
Dibromomethane	Not detected	300		ug/kg	69.4	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	69.4	10061-01-5	
Toluene	Not detected	70		ug/kg	69.4	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	69.4	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	69.4	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	69.4	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	69.4	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	69.4	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	69.4	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	69.4	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	69.4	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	69.4	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	69.4		
o-Xylene	Not detected	70		ug/kg	69.4	95-47-6	
Styrene	Not detected	70		ug/kg	69.4	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	69.4	98-82-8	
Bromoform	Not detected	100		ug/kg	69.4	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	69.4	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	69.4	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	69.4	103-65-1	
Bromobenzene	Not detected	100		ug/kg	69.4	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	69.4	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	69.4	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	69.4	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	69.4	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	69.4	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	69.4	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	69.4	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.15 (continued)

Sample Tag: SB-11 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 06:43, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	69.4	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	69.4	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	69.4	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	69.4	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	69.4	96-12-8	
1,2,4-Trichlorobenzene	Not detected	460		ug/kg	69.4	120-82-1	
1,2,3-Trichlorobenzene	Not detected	460		ug/kg	69.4	87-61-6	
Naphthalene	Not detected	300		ug/kg	69.4	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	69.4	91-57-6	

Lab Sample ID: S20267.16
Sample Tag: SB-11 19-20
Collected Date/Time: 12/21/2020 15:00
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Lab Sample ID: S20267.17
Sample Tag: SB-12 6-7
Collected Date/Time: 12/21/2020 14:30
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	11.241/11	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	82	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 11:13, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:06, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	70.6	60-29-7	
Acetone	Not detected	1,000		ug/kg	70.6	67-64-1	
Methyl iodide	Not detected	100		ug/kg	70.6	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	70.6	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	70.6	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	70.6	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	70.6	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	70.6	75-71-8	
Chloromethane	Not detected	400		ug/kg	70.6	74-87-3	

Lab Sample ID: S20267.17 (continued)
Sample Tag: SB-12 6-7

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:06, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	70.6	75-01-4	
Bromomethane	Not detected	300		ug/kg	70.6	74-83-9	
Chloroethane	Not detected	400		ug/kg	70.6	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	70.6	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	70.6	75-35-4	
Methylene chloride	Not detected	100		ug/kg	70.6	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	70.6	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	70.6	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	70.6	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	70.6	109-99-9	
Chloroform	Not detected	70		ug/kg	70.6	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	70.6	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	70.6	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	70.6	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	70.6	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	70.6	56-23-5	
Benzene	Not detected	70		ug/kg	70.6	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	70.6	107-06-2	
Trichloroethene	Not detected	70		ug/kg	70.6	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	70.6	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	70.6	75-27-4	
Dibromomethane	Not detected	400		ug/kg	70.6	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	70.6	10061-01-5	
Toluene	Not detected	70		ug/kg	70.6	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	70.6	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	70.6	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	70.6	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	70.6	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	70.6	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	70.6	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	70.6	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	70.6	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	70.6	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	70.6		
o-Xylene	Not detected	70		ug/kg	70.6	95-47-6	
Styrene	Not detected	70		ug/kg	70.6	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	70.6	98-82-8	
Bromoform	Not detected	100		ug/kg	70.6	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	70.6	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	70.6	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	70.6	103-65-1	
Bromobenzene	Not detected	100		ug/kg	70.6	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	70.6	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	70.6	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	70.6	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	70.6	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	70.6	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	70.6	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	70.6	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.17 (continued)

Sample Tag: SB-12 6-7

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:06, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	70.6	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	70.6	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	70.6	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	70.6	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	70.6	96-12-8	
1,2,4-Trichlorobenzene	Not detected	470		ug/kg	70.6	120-82-1	
1,2,3-Trichlorobenzene	Not detected	470		ug/kg	70.6	87-61-6	
Naphthalene	Not detected	400		ug/kg	70.6	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	70.6	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.18
Sample Tag: SB-12 10-11
Collected Date/Time: 12/21/2020 14:35
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	11.060/11	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	87	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 11:32, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:28, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	64.6	60-29-7	
Acetone	Not detected	1,000		ug/kg	64.6	67-64-1	
Methyl iodide	Not detected	100		ug/kg	64.6	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	64.6	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	64.6	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	64.6	107-13-1	
2-Butanone (MEK)	Not detected	970		ug/kg	64.6	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	64.6	75-71-8	
Chloromethane	Not detected	300		ug/kg	64.6	74-87-3	

Lab Sample ID: S20267.18 (continued)
Sample Tag: SB-12 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:28, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	60		ug/kg	64.6	75-01-4	
Bromomethane	Not detected	300		ug/kg	64.6	74-83-9	
Chloroethane	Not detected	300		ug/kg	64.6	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	64.6	75-69-4	
1,1-Dichloroethene	Not detected	60		ug/kg	64.6	75-35-4	
Methylene chloride	Not detected	100		ug/kg	64.6	75-09-2	
trans-1,2-Dichloroethene	Not detected	60		ug/kg	64.6	156-60-5	
1,1-Dichloroethane	Not detected	60		ug/kg	64.6	75-34-3	
cis-1,2-Dichloroethene	Not detected	60		ug/kg	64.6	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	64.6	109-99-9	
Chloroform	Not detected	60		ug/kg	64.6	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	64.6	74-97-5	
1,1,1-Trichloroethane	Not detected	60		ug/kg	64.6	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	64.6	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	64.6	591-78-6	
Carbon tetrachloride	Not detected	60		ug/kg	64.6	56-23-5	
Benzene	Not detected	60		ug/kg	64.6	71-43-2	
1,2-Dichloroethane	Not detected	60		ug/kg	64.6	107-06-2	
Trichloroethene	Not detected	60		ug/kg	64.6	79-01-6	
1,2-Dichloropropane	Not detected	60		ug/kg	64.6	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	64.6	75-27-4	
Dibromomethane	Not detected	300		ug/kg	64.6	74-95-3	
cis-1,3-Dichloropropene	Not detected	60		ug/kg	64.6	10061-01-5	
Toluene	Not detected	60		ug/kg	64.6	108-88-3	
trans-1,3-Dichloropropene	Not detected	60		ug/kg	64.6	10061-02-6	
1,1,2-Trichloroethane	Not detected	60		ug/kg	64.6	79-00-5	
Tetrachloroethene	Not detected	60		ug/kg	64.6	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	60		ug/kg	64.6	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	64.6	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	64.6	106-93-4	M
Chlorobenzene	Not detected	60		ug/kg	64.6	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	64.6	630-20-6	
Ethylbenzene	Not detected	60		ug/kg	64.6	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	64.6		
o-Xylene	Not detected	60		ug/kg	64.6	95-47-6	
Styrene	Not detected	60		ug/kg	64.6	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	64.6	98-82-8	
Bromoform	Not detected	100		ug/kg	64.6	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	60		ug/kg	64.6	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	64.6	96-18-4	
n-Propylbenzene	Not detected	60		ug/kg	64.6	103-65-1	
Bromobenzene	Not detected	100		ug/kg	64.6	108-86-1	
1,3,5-Trimethylbenzene	Not detected	60		ug/kg	64.6	108-67-8	
tert-Butylbenzene	Not detected	60		ug/kg	64.6	98-06-6	
1,2,4-Trimethylbenzene	Not detected	60		ug/kg	64.6	95-63-6	
sec-Butylbenzene	Not detected	60		ug/kg	64.6	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	64.6	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	64.6	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	64.6	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.18 (continued)
Sample Tag: SB-12 10-11

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:28, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	64.6	95-50-1	
1,2,3-Trimethylbenzene	Not detected	60		ug/kg	64.6	526-73-8	
n-Butylbenzene	Not detected	60		ug/kg	64.6	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	64.6	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	64.6	96-12-8	
1,2,4-Trichlorobenzene	Not detected	430		ug/kg	64.6	120-82-1	
1,2,3-Trichlorobenzene	Not detected	430		ug/kg	64.6	87-61-6	
Naphthalene	Not detected	300		ug/kg	64.6	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	64.6	91-57-6	

Lab Sample ID: S20267.19
Sample Tag: SB-12 4-15
Collected Date/Time: 12/21/2020 14:40
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Analytical Laboratory Report

Lab Sample ID: S20267.20
Sample Tag: SB-13 4-5
Collected Date/Time: 12/21/2020 14:00
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	10.931/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	84	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 12:12, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	900	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	800	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	1,600	300		ug/kg	5	205-99-2	p
Benzo(k)fluoranthene	1,900	300		ug/kg	5	207-08-9	p
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	1,000	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	1,600	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	700	300		ug/kg	5	85-01-8	
Pyrene	1,600	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:51, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	64	60-29-7	
Acetone	Not detected	1,000		ug/kg	64	67-64-1	
Methyl iodide	Not detected	100		ug/kg	64	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	64	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	64	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	64	107-13-1	
2-Butanone (MEK)	Not detected	960		ug/kg	64	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	64	75-71-8	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.

Lab Sample ID: S20267.20 (continued)
Sample Tag: SB-13 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:51, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	300		ug/kg	64	74-87-3	
Vinyl chloride	Not detected	60		ug/kg	64	75-01-4	
Bromomethane	Not detected	300		ug/kg	64	74-83-9	
Chloroethane	Not detected	300		ug/kg	64	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	64	75-69-4	
1,1-Dichloroethene	Not detected	60		ug/kg	64	75-35-4	
Methylene chloride	Not detected	100		ug/kg	64	75-09-2	
trans-1,2-Dichloroethene	Not detected	60		ug/kg	64	156-60-5	
1,1-Dichloroethane	Not detected	60		ug/kg	64	75-34-3	
cis-1,2-Dichloroethene	Not detected	60		ug/kg	64	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	64	109-99-9	
Chloroform	Not detected	60		ug/kg	64	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	64	74-97-5	
1,1,1-Trichloroethane	Not detected	60		ug/kg	64	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	64	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	64	591-78-6	
Carbon tetrachloride	Not detected	60		ug/kg	64	56-23-5	
Benzene	Not detected	60		ug/kg	64	71-43-2	
1,2-Dichloroethane	Not detected	60		ug/kg	64	107-06-2	
Trichloroethene	Not detected	60		ug/kg	64	79-01-6	
1,2-Dichloropropane	Not detected	60		ug/kg	64	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	64	75-27-4	
Dibromomethane	Not detected	300		ug/kg	64	74-95-3	
cis-1,3-Dichloropropene	Not detected	60		ug/kg	64	10061-01-5	
Toluene	Not detected	60		ug/kg	64	108-88-3	
trans-1,3-Dichloropropene	Not detected	60		ug/kg	64	10061-02-6	
1,1,2-Trichloroethane	Not detected	60		ug/kg	64	79-00-5	
Tetrachloroethene	Not detected	60		ug/kg	64	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	60		ug/kg	64	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	64	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	64	106-93-4	M
Chlorobenzene	Not detected	60		ug/kg	64	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	64	630-20-6	
Ethylbenzene	Not detected	60		ug/kg	64	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	64		
o-Xylene	Not detected	60		ug/kg	64	95-47-6	
Styrene	Not detected	60		ug/kg	64	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	64	98-82-8	
Bromoform	Not detected	100		ug/kg	64	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	60		ug/kg	64	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	64	96-18-4	
n-Propylbenzene	Not detected	60		ug/kg	64	103-65-1	
Bromobenzene	Not detected	100		ug/kg	64	108-86-1	
1,3,5-Trimethylbenzene	Not detected	60		ug/kg	64	108-67-8	
tert-Butylbenzene	Not detected	60		ug/kg	64	98-06-6	
1,2,4-Trimethylbenzene	Not detected	60		ug/kg	64	95-63-6	
sec-Butylbenzene	Not detected	60		ug/kg	64	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	64	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	64	541-73-1	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.20 (continued)

Sample Tag: SB-13 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 07:51, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dichlorobenzene	Not detected	100		ug/kg	64	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	64	95-50-1	
1,2,3-Trimethylbenzene	Not detected	60		ug/kg	64	526-73-8	
n-Butylbenzene	Not detected	60		ug/kg	64	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	64	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	64	96-12-8	
1,2,4-Trichlorobenzene	Not detected	420		ug/kg	64	120-82-1	
1,2,3-Trichlorobenzene	Not detected	420		ug/kg	64	87-61-6	
Naphthalene	Not detected	300		ug/kg	64	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	64	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.21
Sample Tag: SB-13 11-12
Collected Date/Time: 12/21/2020 14:05
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	11.501/11	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	84	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 09:57, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 21:23, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	66.5	60-29-7	
Acetone	Not detected	1,000		ug/kg	66.5	67-64-1	
Methyl iodide	Not detected	100		ug/kg	66.5	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	66.5	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	66.5	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	66.5	107-13-1	
2-Butanone (MEK)	Not detected	1,000		ug/kg	66.5	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	66.5	75-71-8	
Chloromethane	Not detected	300		ug/kg	66.5	74-87-3	

Lab Sample ID: S20267.21 (continued)
Sample Tag: SB-13 11-12

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 21:23, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	66.5	75-01-4	
Bromomethane	Not detected	300		ug/kg	66.5	74-83-9	
Chloroethane	Not detected	300		ug/kg	66.5	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	66.5	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	66.5	75-35-4	
Methylene chloride	Not detected	100		ug/kg	66.5	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	66.5	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	66.5	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	66.5	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	66.5	109-99-9	
Chloroform	Not detected	70		ug/kg	66.5	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	66.5	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	66.5	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	66.5	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	66.5	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	66.5	56-23-5	
Benzene	Not detected	70		ug/kg	66.5	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	66.5	107-06-2	
Trichloroethene	Not detected	70		ug/kg	66.5	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	66.5	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	66.5	75-27-4	
Dibromomethane	Not detected	300		ug/kg	66.5	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	66.5	10061-01-5	
Toluene	Not detected	70		ug/kg	66.5	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	66.5	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	66.5	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	66.5	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	66.5	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	66.5	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	66.5	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	66.5	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	66.5	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	66.5	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	66.5		
o-Xylene	Not detected	70		ug/kg	66.5	95-47-6	
Styrene	Not detected	70		ug/kg	66.5	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	66.5	98-82-8	
Bromoform	Not detected	100		ug/kg	66.5	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	66.5	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	66.5	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	66.5	103-65-1	
Bromobenzene	Not detected	100		ug/kg	66.5	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	66.5	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	66.5	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	66.5	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	66.5	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	66.5	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	66.5	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	66.5	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.21 (continued)
Sample Tag: SB-13 11-12

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 21:23, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	66.5	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	66.5	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	66.5	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	66.5	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	66.5	96-12-8	
1,2,4-Trichlorobenzene	Not detected	440		ug/kg	66.5	120-82-1	
1,2,3-Trichlorobenzene	Not detected	440		ug/kg	66.5	87-61-6	
Naphthalene	Not detected	300		ug/kg	66.5	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	66.5	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.22
Sample Tag: SB-13 14-15
Collected Date/Time: 12/21/2020 14:10
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	10.914/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	85	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 10:20, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 21:46, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	62.7	60-29-7	
Acetone	Not detected	1,000		ug/kg	62.7	67-64-1	
Methyl iodide	Not detected	100		ug/kg	62.7	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	62.7	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	62.7	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	62.7	107-13-1	
2-Butanone (MEK)	Not detected	940		ug/kg	62.7	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	62.7	75-71-8	
Chloromethane	Not detected	300		ug/kg	62.7	74-87-3	

Lab Sample ID: S20267.22 (continued)
Sample Tag: SB-13 14-15

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 21:46, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	60		ug/kg	62.7	75-01-4	
Bromomethane	Not detected	300		ug/kg	62.7	74-83-9	
Chloroethane	Not detected	300		ug/kg	62.7	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	62.7	75-69-4	
1,1-Dichloroethene	Not detected	60		ug/kg	62.7	75-35-4	
Methylene chloride	Not detected	100		ug/kg	62.7	75-09-2	
trans-1,2-Dichloroethene	Not detected	60		ug/kg	62.7	156-60-5	
1,1-Dichloroethane	Not detected	60		ug/kg	62.7	75-34-3	
cis-1,2-Dichloroethene	Not detected	60		ug/kg	62.7	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	62.7	109-99-9	
Chloroform	Not detected	60		ug/kg	62.7	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	62.7	74-97-5	
1,1,1-Trichloroethane	Not detected	60		ug/kg	62.7	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	62.7	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	62.7	591-78-6	
Carbon tetrachloride	Not detected	60		ug/kg	62.7	56-23-5	
Benzene	Not detected	60		ug/kg	62.7	71-43-2	
1,2-Dichloroethane	Not detected	60		ug/kg	62.7	107-06-2	
Trichloroethene	Not detected	60		ug/kg	62.7	79-01-6	
1,2-Dichloropropane	Not detected	60		ug/kg	62.7	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	62.7	75-27-4	
Dibromomethane	Not detected	300		ug/kg	62.7	74-95-3	
cis-1,3-Dichloropropene	Not detected	60		ug/kg	62.7	10061-01-5	
Toluene	Not detected	60		ug/kg	62.7	108-88-3	
trans-1,3-Dichloropropene	Not detected	60		ug/kg	62.7	10061-02-6	
1,1,2-Trichloroethane	Not detected	60		ug/kg	62.7	79-00-5	
Tetrachloroethene	Not detected	60		ug/kg	62.7	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	60		ug/kg	62.7	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	62.7	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	62.7	106-93-4	M
Chlorobenzene	Not detected	60		ug/kg	62.7	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	62.7	630-20-6	
Ethylbenzene	Not detected	60		ug/kg	62.7	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	62.7		
o-Xylene	Not detected	60		ug/kg	62.7	95-47-6	
Styrene	Not detected	60		ug/kg	62.7	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	62.7	98-82-8	
Bromoform	Not detected	100		ug/kg	62.7	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	60		ug/kg	62.7	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	62.7	96-18-4	
n-Propylbenzene	Not detected	60		ug/kg	62.7	103-65-1	
Bromobenzene	Not detected	100		ug/kg	62.7	108-86-1	
1,3,5-Trimethylbenzene	Not detected	60		ug/kg	62.7	108-67-8	
tert-Butylbenzene	Not detected	60		ug/kg	62.7	98-06-6	
1,2,4-Trimethylbenzene	Not detected	60		ug/kg	62.7	95-63-6	
sec-Butylbenzene	Not detected	60		ug/kg	62.7	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	62.7	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	62.7	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	62.7	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.22 (continued)

Sample Tag: SB-13 14-15

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 21:46, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	62.7	95-50-1	
1,2,3-Trimethylbenzene	Not detected	60		ug/kg	62.7	526-73-8	
n-Butylbenzene	Not detected	60		ug/kg	62.7	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	62.7	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	62.7	96-12-8	
1,2,4-Trichlorobenzene	Not detected	410		ug/kg	62.7	120-82-1	
1,2,3-Trichlorobenzene	Not detected	410		ug/kg	62.7	87-61-6	
Naphthalene	Not detected	300		ug/kg	62.7	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	62.7	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.23
Sample Tag: SB-14 3-4
Collected Date/Time: 12/21/2020 11:40
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	12.248/12	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	79	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 10:42, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:09, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	75.3	60-29-7	
Acetone	Not detected	2,000		ug/kg	75.3	67-64-1	
Methyl iodide	Not detected	200		ug/kg	75.3	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	75.3	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	75.3	1634-04-4	
Acrylonitrile	Not detected	200		ug/kg	75.3	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	75.3	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	75.3	75-71-8	
Chloromethane	Not detected	400		ug/kg	75.3	74-87-3	

Lab Sample ID: S20267.23 (continued)
Sample Tag: SB-14 3-4

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:09, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	80		ug/kg	75.3	75-01-4	
Bromomethane	Not detected	300		ug/kg	75.3	74-83-9	
Chloroethane	Not detected	400		ug/kg	75.3	75-00-3	
Trichlorofluoromethane	Not detected	200		ug/kg	75.3	75-69-4	
1,1-Dichloroethene	Not detected	80		ug/kg	75.3	75-35-4	
Methylene chloride	Not detected	200		ug/kg	75.3	75-09-2	
trans-1,2-Dichloroethene	Not detected	80		ug/kg	75.3	156-60-5	
1,1-Dichloroethane	Not detected	80		ug/kg	75.3	75-34-3	
cis-1,2-Dichloroethene	Not detected	80		ug/kg	75.3	156-59-2	
Tetrahydrofuran*	Not detected	2,000		ug/kg	75.3	109-99-9	
Chloroform	Not detected	80		ug/kg	75.3	67-66-3	
Bromochloromethane	Not detected	200		ug/kg	75.3	74-97-5	
1,1,1-Trichloroethane	Not detected	80		ug/kg	75.3	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	75.3	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	75.3	591-78-6	
Carbon tetrachloride	Not detected	80		ug/kg	75.3	56-23-5	
Benzene	Not detected	80		ug/kg	75.3	71-43-2	
1,2-Dichloroethane	Not detected	80		ug/kg	75.3	107-06-2	
Trichloroethene	Not detected	80		ug/kg	75.3	79-01-6	
1,2-Dichloropropane	Not detected	80		ug/kg	75.3	78-87-5	
Bromodichloromethane	Not detected	200		ug/kg	75.3	75-27-4	
Dibromomethane	Not detected	400		ug/kg	75.3	74-95-3	
cis-1,3-Dichloropropene	Not detected	80		ug/kg	75.3	10061-01-5	
Toluene	Not detected	80		ug/kg	75.3	108-88-3	
trans-1,3-Dichloropropene	Not detected	80		ug/kg	75.3	10061-02-6	
1,1,2-Trichloroethane	Not detected	80		ug/kg	75.3	79-00-5	
Tetrachloroethene	Not detected	80		ug/kg	75.3	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	80		ug/kg	75.3	110-57-6	
Dibromochloromethane	Not detected	200		ug/kg	75.3	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	75.3	106-93-4	M
Chlorobenzene	Not detected	80		ug/kg	75.3	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	200		ug/kg	75.3	630-20-6	
Ethylbenzene	Not detected	80		ug/kg	75.3	100-41-4	
p,m-Xylene	Not detected	200		ug/kg	75.3		
o-Xylene	Not detected	80		ug/kg	75.3	95-47-6	
Styrene	Not detected	80		ug/kg	75.3	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	75.3	98-82-8	
Bromoform	Not detected	200		ug/kg	75.3	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	80		ug/kg	75.3	79-34-5	
1,2,3-Trichloropropane	Not detected	200		ug/kg	75.3	96-18-4	
n-Propylbenzene	Not detected	80		ug/kg	75.3	103-65-1	
Bromobenzene	Not detected	200		ug/kg	75.3	108-86-1	
1,3,5-Trimethylbenzene	Not detected	80		ug/kg	75.3	108-67-8	
tert-Butylbenzene	Not detected	80		ug/kg	75.3	98-06-6	
1,2,4-Trimethylbenzene	Not detected	80		ug/kg	75.3	95-63-6	
sec-Butylbenzene	Not detected	80		ug/kg	75.3	135-98-8	
p-Isopropyltoluene	Not detected	200		ug/kg	75.3	99-87-6	
1,3-Dichlorobenzene	Not detected	200		ug/kg	75.3	541-73-1	
1,4-Dichlorobenzene	Not detected	200		ug/kg	75.3	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.23 (continued)

Sample Tag: SB-14 3-4

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:09, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	200		ug/kg	75.3	95-50-1	
1,2,3-Trimethylbenzene	Not detected	80		ug/kg	75.3	526-73-8	
n-Butylbenzene	Not detected	80		ug/kg	75.3	104-51-8	
Hexachloroethane	Not detected	500		ug/kg	75.3	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	75.3	96-12-8	
1,2,4-Trichlorobenzene	Not detected	500		ug/kg	75.3	120-82-1	
1,2,3-Trichlorobenzene	Not detected	500		ug/kg	75.3	87-61-6	
Naphthalene	Not detected	400		ug/kg	75.3	91-20-3	
2-Methylnaphthalene	Not detected	200		ug/kg	75.3	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.24
Sample Tag: SB-14 9-10
Collected Date/Time: 12/21/2020 11:45
Matrix: Soil
COC Reference: 130926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	10.478/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	87	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 11:04, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:31, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	200		ug/kg	62.3	60-29-7	
Acetone	Not detected	1,000		ug/kg	62.3	67-64-1	
Methyl iodide	Not detected	100		ug/kg	62.3	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	62.3	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	200		ug/kg	62.3	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	62.3	107-13-1	
2-Butanone (MEK)	Not detected	930		ug/kg	62.3	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	62.3	75-71-8	
Chloromethane	Not detected	300		ug/kg	62.3	74-87-3	

Lab Sample ID: S20267.24 (continued)
Sample Tag: SB-14 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:31, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	60		ug/kg	62.3	75-01-4	
Bromomethane	Not detected	200		ug/kg	62.3	74-83-9	
Chloroethane	Not detected	300		ug/kg	62.3	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	62.3	75-69-4	
1,1-Dichloroethene	Not detected	60		ug/kg	62.3	75-35-4	
Methylene chloride	Not detected	100		ug/kg	62.3	75-09-2	
trans-1,2-Dichloroethene	Not detected	60		ug/kg	62.3	156-60-5	
1,1-Dichloroethane	Not detected	60		ug/kg	62.3	75-34-3	
cis-1,2-Dichloroethene	Not detected	60		ug/kg	62.3	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	62.3	109-99-9	
Chloroform	Not detected	60		ug/kg	62.3	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	62.3	74-97-5	
1,1,1-Trichloroethane	Not detected	60		ug/kg	62.3	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	62.3	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	62.3	591-78-6	
Carbon tetrachloride	Not detected	60		ug/kg	62.3	56-23-5	
Benzene	Not detected	60		ug/kg	62.3	71-43-2	
1,2-Dichloroethane	Not detected	60		ug/kg	62.3	107-06-2	
Trichloroethene	Not detected	60		ug/kg	62.3	79-01-6	
1,2-Dichloropropane	Not detected	60		ug/kg	62.3	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	62.3	75-27-4	
Dibromomethane	Not detected	300		ug/kg	62.3	74-95-3	
cis-1,3-Dichloropropene	Not detected	60		ug/kg	62.3	10061-01-5	
Toluene	Not detected	60		ug/kg	62.3	108-88-3	
trans-1,3-Dichloropropene	Not detected	60		ug/kg	62.3	10061-02-6	
1,1,2-Trichloroethane	Not detected	60		ug/kg	62.3	79-00-5	
Tetrachloroethene	Not detected	60		ug/kg	62.3	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	60		ug/kg	62.3	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	62.3	124-48-1	
1,2-Dibromoethane	Not detected	20		ug/kg	62.3	106-93-4	M
Chlorobenzene	Not detected	60		ug/kg	62.3	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	62.3	630-20-6	
Ethylbenzene	Not detected	60		ug/kg	62.3	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	62.3		
o-Xylene	Not detected	60		ug/kg	62.3	95-47-6	
Styrene	Not detected	60		ug/kg	62.3	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	62.3	98-82-8	
Bromoform	Not detected	100		ug/kg	62.3	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	60		ug/kg	62.3	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	62.3	96-18-4	
n-Propylbenzene	Not detected	60		ug/kg	62.3	103-65-1	
Bromobenzene	Not detected	100		ug/kg	62.3	108-86-1	
1,3,5-Trimethylbenzene	Not detected	60		ug/kg	62.3	108-67-8	
tert-Butylbenzene	Not detected	60		ug/kg	62.3	98-06-6	
1,2,4-Trimethylbenzene	Not detected	60		ug/kg	62.3	95-63-6	
sec-Butylbenzene	Not detected	60		ug/kg	62.3	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	62.3	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	62.3	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	62.3	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.24 (continued)

Sample Tag: SB-14 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:31, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	62.3	95-50-1	
1,2,3-Trimethylbenzene	Not detected	60		ug/kg	62.3	526-73-8	
n-Butylbenzene	Not detected	60		ug/kg	62.3	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	62.3	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	62.3	96-12-8	
1,2,4-Trichlorobenzene	Not detected	410		ug/kg	62.3	120-82-1	
1,2,3-Trichlorobenzene	Not detected	410		ug/kg	62.3	87-61-6	
Naphthalene	Not detected	300		ug/kg	62.3	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	62.3	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.25
Sample Tag: SB-14 14-15
Collected Date/Time: 12/21/2020 11:50
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Analytical Laboratory Report

Lab Sample ID: S20267.26
Sample Tag: SB-15 3-4
Collected Date/Time: 12/21/2020 12:10
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	10.055/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	79	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 11:27, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	5,500	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	5,500	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 18:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	3,000		ug/kg	762	60-29-7	Y
Acetone	Not detected	20,000		ug/kg	762	67-64-1	Y
Methyl iodide	Not detected	2,000		ug/kg	762	74-88-4	Y
Carbon disulfide	Not detected	4,000		ug/kg	762	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	3,000		ug/kg	762	1634-04-4	Y
Acrylonitrile	Not detected	2,000		ug/kg	762	107-13-1	Y
2-Butanone (MEK)	Not detected	11,000		ug/kg	762	78-93-3	Y
Dichlorodifluoromethane	Not detected	4,000		ug/kg	762	75-71-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S20267.26 (continued)
Sample Tag: SB-15 3-4

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 18:48, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	4,000		ug/kg	762	74-87-3	Y
Vinyl chloride	Not detected	800		ug/kg	762	75-01-4	Y
Bromomethane	Not detected	3,000		ug/kg	762	74-83-9	Y
Chloroethane	Not detected	4,000		ug/kg	762	75-00-3	Y
Trichlorofluoromethane	Not detected	2,000		ug/kg	762	75-69-4	Y
1,1-Dichloroethene	Not detected	800		ug/kg	762	75-35-4	Y
Methylene chloride	Not detected	2,000		ug/kg	762	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	800		ug/kg	762	156-60-5	Y
1,1-Dichloroethane	Not detected	800		ug/kg	762	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	800		ug/kg	762	156-59-2	Y
Tetrahydrofuran*	Not detected	20,000		ug/kg	762	109-99-9	Y
Chloroform	Not detected	800		ug/kg	762	67-66-3	Y
Bromochloromethane	Not detected	2,000		ug/kg	762	74-97-5	Y
1,1,1-Trichloroethane	Not detected	800		ug/kg	762	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	40,000		ug/kg	762	108-10-1	Y
2-Hexanone	Not detected	40,000		ug/kg	762	591-78-6	Y
Carbon tetrachloride	Not detected	800		ug/kg	762	56-23-5	Y
Benzene	Not detected	800		ug/kg	762	71-43-2	Y
1,2-Dichloroethane	Not detected	800		ug/kg	762	107-06-2	Y
Trichloroethene	Not detected	800		ug/kg	762	79-01-6	Y
1,2-Dichloropropane	Not detected	800		ug/kg	762	78-87-5	Y
Bromodichloromethane	Not detected	2,000		ug/kg	762	75-27-4	Y
Dibromomethane	Not detected	4,000		ug/kg	762	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	800		ug/kg	762	10061-01-5	Y
Toluene	Not detected	800		ug/kg	762	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	800		ug/kg	762	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	800		ug/kg	762	79-00-5	Y
Tetrachloroethene	Not detected	800		ug/kg	762	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	800		ug/kg	762	110-57-6	Y
Dibromochloromethane	Not detected	2,000		ug/kg	762	124-48-1	Y
1,2-Dibromoethane	Not detected	300		ug/kg	762	106-93-4	YM
Chlorobenzene	Not detected	800		ug/kg	762	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	2,000		ug/kg	762	630-20-6	Y
Ethylbenzene	14,600	800		ug/kg	762	100-41-4	Y
p,m-Xylene	7,000	2,000		ug/kg	762		Y
o-Xylene	Not detected	800		ug/kg	762	95-47-6	Y
Styrene	Not detected	800		ug/kg	762	100-42-5	Y
Isopropylbenzene	7,000	4,000		ug/kg	762	98-82-8	Y
Bromoform	Not detected	2,000		ug/kg	762	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	800		ug/kg	762	79-34-5	Y
1,2,3-Trichloropropane	Not detected	2,000		ug/kg	762	96-18-4	Y
n-Propylbenzene	27,500	800		ug/kg	762	103-65-1	Y
Bromobenzene	Not detected	2,000		ug/kg	762	108-86-1	Y
1,3,5-Trimethylbenzene	1,200	800		ug/kg	762	108-67-8	Y
tert-Butylbenzene	Not detected	800		ug/kg	762	98-06-6	Y
1,2,4-Trimethylbenzene	2,500	800		ug/kg	762	95-63-6	Y
sec-Butylbenzene	3,100	800		ug/kg	762	135-98-8	Y
p-Isopropyltoluene	Not detected	2,000		ug/kg	762	99-87-6	Y

Y-Elevated reporting limit due to high target concentration
M-Result reported to MDL not RDL

Lab Sample ID: S20267.26 (continued)

Sample Tag: SB-15 3-4

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 18:48, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,3-Dichlorobenzene	Not detected	2,000		ug/kg	762	541-73-1	Y
1,4-Dichlorobenzene	Not detected	2,000		ug/kg	762	106-46-7	Y
1,2-Dichlorobenzene	Not detected	2,000		ug/kg	762	95-50-1	Y
1,2,3-Trimethylbenzene	5,100	800		ug/kg	762	526-73-8	Y
n-Butylbenzene	7,500	800		ug/kg	762	104-51-8	Y
Hexachloroethane	Not detected	5,000		ug/kg	762	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	4,000		ug/kg	762	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	5,000		ug/kg	762	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	5,000		ug/kg	762	87-61-6	Y
Naphthalene	13,000	4,000		ug/kg	762	91-20-3	Y
2-Methylnaphthalene	12,000	2,000		ug/kg	762	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S20267.27
Sample Tag: SB-15 6-7
Collected Date/Time: 12/21/2020 12:15
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	9.374/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	80	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 11:49, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	1,000	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:55, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	79.2	60-29-7	
Acetone	Not detected	2,000		ug/kg	79.2	67-64-1	
Methyl iodide	Not detected	200		ug/kg	79.2	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	79.2	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	79.2	1634-04-4	
Acrylonitrile	Not detected	200		ug/kg	79.2	107-13-1	
2-Butanone (MEK)	Not detected	1,200		ug/kg	79.2	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	79.2	75-71-8	
Chloromethane	Not detected	400		ug/kg	79.2	74-87-3	

Lab Sample ID: S20267.27 (continued)
Sample Tag: SB-15 6-7

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:55, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	80		ug/kg	79.2	75-01-4	
Bromomethane	Not detected	300		ug/kg	79.2	74-83-9	
Chloroethane	Not detected	400		ug/kg	79.2	75-00-3	
Trichlorofluoromethane	Not detected	200		ug/kg	79.2	75-69-4	
1,1-Dichloroethene	Not detected	80		ug/kg	79.2	75-35-4	
Methylene chloride	Not detected	200		ug/kg	79.2	75-09-2	
trans-1,2-Dichloroethene	Not detected	80		ug/kg	79.2	156-60-5	
1,1-Dichloroethane	Not detected	80		ug/kg	79.2	75-34-3	
cis-1,2-Dichloroethene	Not detected	80		ug/kg	79.2	156-59-2	
Tetrahydrofuran*	Not detected	2,000		ug/kg	79.2	109-99-9	
Chloroform	Not detected	80		ug/kg	79.2	67-66-3	
Bromochloromethane	Not detected	200		ug/kg	79.2	74-97-5	
1,1,1-Trichloroethane	Not detected	80		ug/kg	79.2	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	79.2	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	79.2	591-78-6	
Carbon tetrachloride	Not detected	80		ug/kg	79.2	56-23-5	
Benzene	Not detected	80		ug/kg	79.2	71-43-2	
1,2-Dichloroethane	Not detected	80		ug/kg	79.2	107-06-2	
Trichloroethene	Not detected	80		ug/kg	79.2	79-01-6	
1,2-Dichloropropane	Not detected	80		ug/kg	79.2	78-87-5	
Bromodichloromethane	Not detected	200		ug/kg	79.2	75-27-4	
Dibromomethane	Not detected	400		ug/kg	79.2	74-95-3	
cis-1,3-Dichloropropene	Not detected	80		ug/kg	79.2	10061-01-5	
Toluene	Not detected	80		ug/kg	79.2	108-88-3	
trans-1,3-Dichloropropene	Not detected	80		ug/kg	79.2	10061-02-6	
1,1,2-Trichloroethane	Not detected	80		ug/kg	79.2	79-00-5	
Tetrachloroethene	Not detected	80		ug/kg	79.2	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	80		ug/kg	79.2	110-57-6	
Dibromochloromethane	Not detected	200		ug/kg	79.2	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	79.2	106-93-4	M
Chlorobenzene	Not detected	80		ug/kg	79.2	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	200		ug/kg	79.2	630-20-6	
Ethylbenzene	Not detected	80		ug/kg	79.2	100-41-4	
p,m-Xylene	Not detected	200		ug/kg	79.2		
o-Xylene	Not detected	80		ug/kg	79.2	95-47-6	
Styrene	Not detected	80		ug/kg	79.2	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	79.2	98-82-8	
Bromoform	Not detected	200		ug/kg	79.2	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	80		ug/kg	79.2	79-34-5	
1,2,3-Trichloropropane	Not detected	200		ug/kg	79.2	96-18-4	
n-Propylbenzene	1,500	80		ug/kg	79.2	103-65-1	
Bromobenzene	Not detected	200		ug/kg	79.2	108-86-1	
1,3,5-Trimethylbenzene	Not detected	80		ug/kg	79.2	108-67-8	
tert-Butylbenzene	Not detected	80		ug/kg	79.2	98-06-6	
1,2,4-Trimethylbenzene	Not detected	80		ug/kg	79.2	95-63-6	
sec-Butylbenzene	90	80		ug/kg	79.2	135-98-8	
p-Isopropyltoluene	Not detected	200		ug/kg	79.2	99-87-6	
1,3-Dichlorobenzene	Not detected	200		ug/kg	79.2	541-73-1	
1,4-Dichlorobenzene	Not detected	200		ug/kg	79.2	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.27 (continued)

Sample Tag: SB-15 6-7

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/22/20 22:55, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	200		ug/kg	79.2	95-50-1	
1,2,3-Trimethylbenzene	Not detected	80		ug/kg	79.2	526-73-8	
n-Butylbenzene	210	80		ug/kg	79.2	104-51-8	
Hexachloroethane	Not detected	500		ug/kg	79.2	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	79.2	96-12-8	
1,2,4-Trichlorobenzene	Not detected	520		ug/kg	79.2	120-82-1	
1,2,3-Trichlorobenzene	Not detected	520		ug/kg	79.2	87-61-6	
Naphthalene	1,600	400		ug/kg	79.2	91-20-3	
2-Methylnaphthalene	500	200		ug/kg	79.2	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.28
Sample Tag: SB-15 14-15
Collected Date/Time: 12/21/2020 12:20
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Analytical Laboratory Report

Lab Sample ID: S20267.29
Sample Tag: SB-16 4-5
Collected Date/Time: 12/21/2020 13:15
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	10.584/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	84	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 11:50, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	1,600	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	2,500	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 19:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	3,000		ug/kg	658	60-29-7	Y
Acetone	Not detected	10,000		ug/kg	658	67-64-1	Y
Methyl iodide	Not detected	1,000		ug/kg	658	74-88-4	Y
Carbon disulfide	Not detected	3,000		ug/kg	658	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	3,000		ug/kg	658	1634-04-4	Y
Acrylonitrile	Not detected	1,000		ug/kg	658	107-13-1	Y
2-Butanone (MEK)	Not detected	9,900		ug/kg	658	78-93-3	Y
Dichlorodifluoromethane	Not detected	3,000		ug/kg	658	75-71-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S20267.29 (continued)
Sample Tag: SB-16 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 19:11, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloromethane	Not detected	3,000		ug/kg	658	74-87-3	Y
Vinyl chloride	Not detected	700		ug/kg	658	75-01-4	Y
Bromomethane	Not detected	3,000		ug/kg	658	74-83-9	Y
Chloroethane	Not detected	3,000		ug/kg	658	75-00-3	Y
Trichlorofluoromethane	Not detected	1,000		ug/kg	658	75-69-4	Y
1,1-Dichloroethene	Not detected	700		ug/kg	658	75-35-4	Y
Methylene chloride	Not detected	1,000		ug/kg	658	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	700		ug/kg	658	156-60-5	Y
1,1-Dichloroethane	Not detected	700		ug/kg	658	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	700		ug/kg	658	156-59-2	Y
Tetrahydrofuran*	Not detected	10,000		ug/kg	658	109-99-9	Y
Chloroform	Not detected	700		ug/kg	658	67-66-3	Y
Bromochloromethane	Not detected	1,000		ug/kg	658	74-97-5	Y
1,1,1-Trichloroethane	Not detected	700		ug/kg	658	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	30,000		ug/kg	658	108-10-1	Y
2-Hexanone	Not detected	30,000		ug/kg	658	591-78-6	Y
Carbon tetrachloride	Not detected	700		ug/kg	658	56-23-5	Y
Benzene	Not detected	700		ug/kg	658	71-43-2	Y
1,2-Dichloroethane	Not detected	700		ug/kg	658	107-06-2	Y
Trichloroethene	Not detected	700		ug/kg	658	79-01-6	Y
1,2-Dichloropropane	Not detected	700		ug/kg	658	78-87-5	Y
Bromodichloromethane	Not detected	1,000		ug/kg	658	75-27-4	Y
Dibromomethane	Not detected	3,000		ug/kg	658	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	700		ug/kg	658	10061-01-5	Y
Toluene	Not detected	700		ug/kg	658	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	700		ug/kg	658	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	700		ug/kg	658	79-00-5	Y
Tetrachloroethene	Not detected	700		ug/kg	658	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	700		ug/kg	658	110-57-6	Y
Dibromochloromethane	Not detected	1,000		ug/kg	658	124-48-1	Y
1,2-Dibromoethane	Not detected	300		ug/kg	658	106-93-4	YM
Chlorobenzene	Not detected	700		ug/kg	658	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	1,000		ug/kg	658	630-20-6	Y
Ethylbenzene	Not detected	700		ug/kg	658	100-41-4	Y
p,m-Xylene	Not detected	1,000		ug/kg	658		Y
o-Xylene	Not detected	700		ug/kg	658	95-47-6	Y
Styrene	Not detected	700		ug/kg	658	100-42-5	Y
Isopropylbenzene	Not detected	3,000		ug/kg	658	98-82-8	Y
Bromoform	Not detected	1,000		ug/kg	658	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	700		ug/kg	658	79-34-5	Y
1,2,3-Trichloropropane	Not detected	1,000		ug/kg	658	96-18-4	Y
n-Propylbenzene	7,700	700		ug/kg	658	103-65-1	Y
Bromobenzene	Not detected	1,000		ug/kg	658	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	700		ug/kg	658	108-67-8	Y
tert-Butylbenzene	Not detected	700		ug/kg	658	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	700		ug/kg	658	95-63-6	Y
sec-Butylbenzene	900	700		ug/kg	658	135-98-8	Y
p-Isopropyltoluene	Not detected	1,000		ug/kg	658	99-87-6	Y

Y-Elevated reporting limit due to high target concentration
M-Result reported to MDL not RDL

Lab Sample ID: S20267.29 (continued)

Sample Tag: SB-16 4-5

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 19:11, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,3-Dichlorobenzene	Not detected	1,000		ug/kg	658	541-73-1	Y
1,4-Dichlorobenzene	Not detected	1,000		ug/kg	658	106-46-7	Y
1,2-Dichlorobenzene	Not detected	1,000		ug/kg	658	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	700		ug/kg	658	526-73-8	Y
n-Butylbenzene	2,500	700		ug/kg	658	104-51-8	Y
Hexachloroethane	Not detected	4,000		ug/kg	658	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	3,000		ug/kg	658	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	4,300		ug/kg	658	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	4,300		ug/kg	658	87-61-6	Y
Naphthalene	Not detected	3,000		ug/kg	658	91-20-3	Y
2-Methylnaphthalene	4,000	1,000		ug/kg	658	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S20267.30
Sample Tag: SB-16 9-10
Collected Date/Time: 12/21/2020 13:20
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	9.454/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	88	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 12:08, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 14:15, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	66.9	60-29-7	
Acetone	Not detected	1,000		ug/kg	66.9	67-64-1	
Methyl iodide	Not detected	100		ug/kg	66.9	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	66.9	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	66.9	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	66.9	107-13-1	
2-Butanone (MEK)	Not detected	1,000		ug/kg	66.9	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	66.9	75-71-8	
Chloromethane	Not detected	300		ug/kg	66.9	74-87-3	

Lab Sample ID: S20267.30 (continued)
Sample Tag: SB-16 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 14:15, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	66.9	75-01-4	
Bromomethane	Not detected	300		ug/kg	66.9	74-83-9	
Chloroethane	Not detected	300		ug/kg	66.9	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	66.9	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	66.9	75-35-4	
Methylene chloride	Not detected	100		ug/kg	66.9	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	66.9	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	66.9	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	66.9	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	66.9	109-99-9	
Chloroform	Not detected	70		ug/kg	66.9	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	66.9	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	66.9	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	66.9	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	66.9	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	66.9	56-23-5	
Benzene	Not detected	70		ug/kg	66.9	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	66.9	107-06-2	
Trichloroethene	Not detected	70		ug/kg	66.9	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	66.9	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	66.9	75-27-4	
Dibromomethane	Not detected	300		ug/kg	66.9	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	66.9	10061-01-5	
Toluene	Not detected	70		ug/kg	66.9	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	66.9	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	66.9	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	66.9	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	66.9	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	66.9	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	66.9	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	66.9	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	66.9	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	66.9	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	66.9		
o-Xylene	Not detected	70		ug/kg	66.9	95-47-6	
Styrene	Not detected	70		ug/kg	66.9	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	66.9	98-82-8	
Bromoform	Not detected	100		ug/kg	66.9	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	66.9	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	66.9	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	66.9	103-65-1	
Bromobenzene	Not detected	100		ug/kg	66.9	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	66.9	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	66.9	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	66.9	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	66.9	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	66.9	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	66.9	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	66.9	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.30 (continued)
Sample Tag: SB-16 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 14:15, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	66.9	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	66.9	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	66.9	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	66.9	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	66.9	96-12-8	
1,2,4-Trichlorobenzene	Not detected	440		ug/kg	66.9	120-82-1	
1,2,3-Trichlorobenzene	Not detected	440		ug/kg	66.9	87-61-6	
Naphthalene	Not detected	300		ug/kg	66.9	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	66.9	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.31
Sample Tag: SB-16 14-15
Collected Date/Time: 12/21/2020 13:25
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Analytical Laboratory Report

Lab Sample ID: S20267.32
Sample Tag: SB-17 5-6
Collected Date/Time: 12/21/2020 12:45
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	9.387/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	82	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 12:26, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 14:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	75.9	60-29-7	
Acetone	Not detected	2,000		ug/kg	75.9	67-64-1	
Methyl iodide	Not detected	200		ug/kg	75.9	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	75.9	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	75.9	1634-04-4	
Acrylonitrile	Not detected	200		ug/kg	75.9	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	75.9	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	75.9	75-71-8	
Chloromethane	Not detected	400		ug/kg	75.9	74-87-3	

Lab Sample ID: S20267.32 (continued)
Sample Tag: SB-17 5-6

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 14:38, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	80		ug/kg	75.9	75-01-4	
Bromomethane	Not detected	300		ug/kg	75.9	74-83-9	
Chloroethane	Not detected	400		ug/kg	75.9	75-00-3	
Trichlorofluoromethane	Not detected	200		ug/kg	75.9	75-69-4	
1,1-Dichloroethene	Not detected	80		ug/kg	75.9	75-35-4	
Methylene chloride	Not detected	200		ug/kg	75.9	75-09-2	
trans-1,2-Dichloroethene	Not detected	80		ug/kg	75.9	156-60-5	
1,1-Dichloroethane	Not detected	80		ug/kg	75.9	75-34-3	
cis-1,2-Dichloroethene	Not detected	80		ug/kg	75.9	156-59-2	
Tetrahydrofuran*	Not detected	2,000		ug/kg	75.9	109-99-9	
Chloroform	Not detected	80		ug/kg	75.9	67-66-3	
Bromochloromethane	Not detected	200		ug/kg	75.9	74-97-5	
1,1,1-Trichloroethane	Not detected	80		ug/kg	75.9	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	75.9	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	75.9	591-78-6	
Carbon tetrachloride	Not detected	80		ug/kg	75.9	56-23-5	
Benzene	Not detected	80		ug/kg	75.9	71-43-2	
1,2-Dichloroethane	Not detected	80		ug/kg	75.9	107-06-2	
Trichloroethene	Not detected	80		ug/kg	75.9	79-01-6	
1,2-Dichloropropane	Not detected	80		ug/kg	75.9	78-87-5	
Bromodichloromethane	Not detected	200		ug/kg	75.9	75-27-4	
Dibromomethane	Not detected	400		ug/kg	75.9	74-95-3	
cis-1,3-Dichloropropene	Not detected	80		ug/kg	75.9	10061-01-5	
Toluene	Not detected	80		ug/kg	75.9	108-88-3	
trans-1,3-Dichloropropene	Not detected	80		ug/kg	75.9	10061-02-6	
1,1,2-Trichloroethane	Not detected	80		ug/kg	75.9	79-00-5	
Tetrachloroethene	Not detected	80		ug/kg	75.9	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	80		ug/kg	75.9	110-57-6	
Dibromochloromethane	Not detected	200		ug/kg	75.9	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	75.9	106-93-4	M
Chlorobenzene	Not detected	80		ug/kg	75.9	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	200		ug/kg	75.9	630-20-6	
Ethylbenzene	Not detected	80		ug/kg	75.9	100-41-4	
p,m-Xylene	Not detected	200		ug/kg	75.9		
o-Xylene	Not detected	80		ug/kg	75.9	95-47-6	
Styrene	Not detected	80		ug/kg	75.9	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	75.9	98-82-8	
Bromoform	Not detected	200		ug/kg	75.9	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	80		ug/kg	75.9	79-34-5	
1,2,3-Trichloropropane	Not detected	200		ug/kg	75.9	96-18-4	
n-Propylbenzene	Not detected	80		ug/kg	75.9	103-65-1	
Bromobenzene	Not detected	200		ug/kg	75.9	108-86-1	
1,3,5-Trimethylbenzene	Not detected	80		ug/kg	75.9	108-67-8	
tert-Butylbenzene	Not detected	80		ug/kg	75.9	98-06-6	
1,2,4-Trimethylbenzene	Not detected	80		ug/kg	75.9	95-63-6	
sec-Butylbenzene	Not detected	80		ug/kg	75.9	135-98-8	
p-Isopropyltoluene	Not detected	200		ug/kg	75.9	99-87-6	
1,3-Dichlorobenzene	Not detected	200		ug/kg	75.9	541-73-1	
1,4-Dichlorobenzene	Not detected	200		ug/kg	75.9	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.32 (continued)

Sample Tag: SB-17 5-6

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 14:38, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	200		ug/kg	75.9	95-50-1	
1,2,3-Trimethylbenzene	Not detected	80		ug/kg	75.9	526-73-8	
n-Butylbenzene	Not detected	80		ug/kg	75.9	104-51-8	
Hexachloroethane	Not detected	500		ug/kg	75.9	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	75.9	96-12-8	
1,2,4-Trichlorobenzene	Not detected	500		ug/kg	75.9	120-82-1	
1,2,3-Trichlorobenzene	Not detected	500		ug/kg	75.9	87-61-6	
Naphthalene	Not detected	400		ug/kg	75.9	91-20-3	
2-Methylnaphthalene	Not detected	200		ug/kg	75.9	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.33
Sample Tag: SB-17 9-10
Collected Date/Time: 12/21/2020 12:50
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
PNA Extraction*	Completed	SW3546	12/28/20 12:30	PTW	
Sample wt. (g) / Methanol (ml)*	9.780/10	SW5035A	12/22/20 14:09	BML	

Inorganics

Method: SM2540B, Run Date: 12/22/20 21:15, Analyst: REJ

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	84	1		%	1		

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/29/20 12:44, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	5	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	5	208-96-8	
Anthracene	Not detected	300		ug/kg	5	120-12-7	
Benzo(a)anthracene	Not detected	300		ug/kg	5	56-55-3	
Benzo(a)pyrene	Not detected	300		ug/kg	5	50-32-8	
Benzo(b)fluoranthene	Not detected	300		ug/kg	5	205-99-2	
Benzo(k)fluoranthene	Not detected	300		ug/kg	5	207-08-9	
Benzo(ghi)perylene	Not detected	300		ug/kg	5	191-24-2	
Chrysene	Not detected	300		ug/kg	5	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	5	53-70-3	
Fluoranthene	Not detected	300		ug/kg	5	206-44-0	
Fluorene	Not detected	300		ug/kg	5	86-73-7	
Indeno(1,2,3-cd)pyrene	Not detected	300		ug/kg	5	193-39-5	
Naphthalene	Not detected	300		ug/kg	5	91-20-3	
Phenanthrene	Not detected	300		ug/kg	5	85-01-8	
Pyrene	Not detected	300		ug/kg	5	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	5	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 15:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	70.4	60-29-7	
Acetone	Not detected	1,000		ug/kg	70.4	67-64-1	
Methyl iodide	Not detected	100		ug/kg	70.4	74-88-4	
Carbon disulfide	Not detected	400		ug/kg	70.4	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	70.4	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	70.4	107-13-1	
2-Butanone (MEK)	Not detected	1,100		ug/kg	70.4	78-93-3	
Dichlorodifluoromethane	Not detected	400		ug/kg	70.4	75-71-8	
Chloromethane	Not detected	400		ug/kg	70.4	74-87-3	

Lab Sample ID: S20267.33 (continued)
Sample Tag: SB-17 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 15:00, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl chloride	Not detected	70		ug/kg	70.4	75-01-4	
Bromomethane	Not detected	300		ug/kg	70.4	74-83-9	
Chloroethane	Not detected	400		ug/kg	70.4	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	70.4	75-69-4	
1,1-Dichloroethene	Not detected	70		ug/kg	70.4	75-35-4	
Methylene chloride	Not detected	100		ug/kg	70.4	75-09-2	
trans-1,2-Dichloroethene	Not detected	70		ug/kg	70.4	156-60-5	
1,1-Dichloroethane	Not detected	70		ug/kg	70.4	75-34-3	
cis-1,2-Dichloroethene	Not detected	70		ug/kg	70.4	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	70.4	109-99-9	
Chloroform	Not detected	70		ug/kg	70.4	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	70.4	74-97-5	
1,1,1-Trichloroethane	Not detected	70		ug/kg	70.4	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	4,000		ug/kg	70.4	108-10-1	
2-Hexanone	Not detected	4,000		ug/kg	70.4	591-78-6	
Carbon tetrachloride	Not detected	70		ug/kg	70.4	56-23-5	
Benzene	Not detected	70		ug/kg	70.4	71-43-2	
1,2-Dichloroethane	Not detected	70		ug/kg	70.4	107-06-2	
Trichloroethene	Not detected	70		ug/kg	70.4	79-01-6	
1,2-Dichloropropane	Not detected	70		ug/kg	70.4	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	70.4	75-27-4	
Dibromomethane	Not detected	400		ug/kg	70.4	74-95-3	
cis-1,3-Dichloropropene	Not detected	70		ug/kg	70.4	10061-01-5	
Toluene	Not detected	70		ug/kg	70.4	108-88-3	
trans-1,3-Dichloropropene	Not detected	70		ug/kg	70.4	10061-02-6	
1,1,2-Trichloroethane	Not detected	70		ug/kg	70.4	79-00-5	
Tetrachloroethene	Not detected	70		ug/kg	70.4	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	70		ug/kg	70.4	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	70.4	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	70.4	106-93-4	M
Chlorobenzene	Not detected	70		ug/kg	70.4	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	70.4	630-20-6	
Ethylbenzene	Not detected	70		ug/kg	70.4	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	70.4		
o-Xylene	Not detected	70		ug/kg	70.4	95-47-6	
Styrene	Not detected	70		ug/kg	70.4	100-42-5	
Isopropylbenzene	Not detected	400		ug/kg	70.4	98-82-8	
Bromoform	Not detected	100		ug/kg	70.4	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	70		ug/kg	70.4	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	70.4	96-18-4	
n-Propylbenzene	Not detected	70		ug/kg	70.4	103-65-1	
Bromobenzene	Not detected	100		ug/kg	70.4	108-86-1	
1,3,5-Trimethylbenzene	Not detected	70		ug/kg	70.4	108-67-8	
tert-Butylbenzene	Not detected	70		ug/kg	70.4	98-06-6	
1,2,4-Trimethylbenzene	Not detected	70		ug/kg	70.4	95-63-6	
sec-Butylbenzene	Not detected	70		ug/kg	70.4	135-98-8	
p-Isopropyltoluene	Not detected	100		ug/kg	70.4	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	70.4	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	70.4	106-46-7	

M-Result reported to MDL not RDL

Lab Sample ID: S20267.33 (continued)

Sample Tag: SB-17 9-10

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/23/20 15:00, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	100		ug/kg	70.4	95-50-1	
1,2,3-Trimethylbenzene	Not detected	70		ug/kg	70.4	526-73-8	
n-Butylbenzene	Not detected	70		ug/kg	70.4	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	70.4	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	400		ug/kg	70.4	96-12-8	
1,2,4-Trichlorobenzene	Not detected	460		ug/kg	70.4	120-82-1	
1,2,3-Trichlorobenzene	Not detected	460		ug/kg	70.4	87-61-6	
Naphthalene	Not detected	400		ug/kg	70.4	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	70.4	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S20267.34
Sample Tag: SB-17 14-15
Collected Date/Time: 12/21/2020 12:55
Matrix: Soil
COC Reference: 130929

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	4.8	IR
1	4oz Glass	None	Yes	4.8	IR

Other / Misc.

Method: , Run Date: 12/23/20 08:54, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Merit Laboratories Login Checklist

Lab Set ID: S20267
Client: PME02 (PM Environmental, Inc. - Berkley)
Project: 01-12411-1-0001
Submitted: 12/22/2020 12:15 Login User: SRS

Attention: Jana Beumel
Address: PM Environmental, Inc.
4080 W. Eleven Mile
Berkley, MI 48072

Phone: O:248-336-9988 FAX:
Email: Beumel@pmenv.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.8
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 3

130925

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Jana Beumel
COMPANY: PM Environmental
ADDRESS: 4080 W. 11 Mile
CITY: Berkley STATE: MI ZIP CODE: 48072
PHONE NO. FAX NO. P.O. NO.
E-MAIL ADDRESS: Beumel@pmenv.com QUOTE NO.

INVOICE TO

CONTACT NAME
☒ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 01-12411-1-0001
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jana Beumel /Jana Beul

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs	PNAs	Special Instructions
202607.01	12/21/20	940	SB-6 10-11	S	2	1					1		X	X	
.02		945	SB-6 14-15	S	2	1					1		X	X	Hold
.03		1010	SB-7 4-5	S	2	1					1		X	X	
.04		1015	SB-7 7-8	S	2	1					1		X	X	Hold
.05		1020	SB-7 14-15	S	2	1					1		X	X	
.06		11:10	SB-8 4-5	S	2	1					1		X	X	
.07		11:15	SB-8 9-10	S	2	1					1		X	X	
.08		11:20	SB-8 14-15	S	2	1					1		X	X	Hold
.09		1040	SB-9 4-5	S	2	1					1		X	X	
.10		1045	SB-9 10-11	S	2	1					1		X	X	
.11		1050	SB-9 14-15	S	2	1					1		X	X	Hold
.12	↓	1335	SB-10 6.5-7.5	S	2	1					1		X	X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Jana Beumel / Sampler	DATE 12/21/20	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION	PM Storage	DATE 12/21/20	TIME 1600
RELINQUISHED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 12/22/20	TIME 1215
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 12/22/20	TIME 1215

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 12-22-20	TIME 1000

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 2 OF 3

130926

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Jana Beumel
COMPANY: PM Environmental
ADDRESS: 4080 W. 11 Mile
CITY: Berkley STATE: MI ZIP CODE: 48072
PHONE NO. FAX NO. P.O. NO.
E-MAIL ADDRESS: BeumelC@pmenv.com QUOTE NO.

INVOICE TO

CONTACT NAME ☒SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 01-12411-1-0001
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jana Beumel/JanaBeu

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☒ 5 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs	PNAs	Special Instructions
202607.13	12/21/20	1340	SB-10 14-15	S	2	1					1		X	X	
.14		1450	SB-11 3-4	S	2	1					1		X	X	
.15		1455	SB-11 10-11	S	2	1					1		X	X	
.16		1500	SB-11 19-20	S	2	1					1		X	X	Hold
.17		1430	SB-12 6-7	S	2	1					1		X	X	
.18		1435	SB-12 10-11	S	2	1					1		X	X	
.19		1440	SB-12 14-15	S	2	1					1		X	X	Hold
.20		1400	SB-13 4-5	S	2	1					1		X	X	
.21		1405	SB-13 11-12	S	2	1					1		X	X	
.22		1410	SB-13 14-15	S	2	1					1		X	X	
.23		1140	SB-14 3-4	S	2	1					1		X	X	
.24		1145	SB-14 9-10	S	2	1					1		X	X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	JanaBeu ☒Sampler	DATE 12/21/20	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION	PM Storage	DATE 12/21/20	TIME 1600
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/22/20	TIME 1215

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 3 OF 3

130929

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Jana Beumel
COMPANY: PM Environmental
ADDRESS: 4080 W. 11 Mile
CITY: Berkley STATE: MI ZIP CODE: 48072
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Beumel@pmenv.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 01-12411-1-0001
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jana Beumel/JanaBeu

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs	PNAs	Special Instructions
202067.25	12/21/20	1150	SB-14 14-15	S	2	1					1		X	X	Hold
.26		1210	SB-15 3-4	S	2	1					1		X	X	
.27		1215	SB-15 6-7	S	2	1					1		X	X	
.28		1220	SB-15 14-15	S	2	1					1		X	X	Hold
.29		1315	SB-16 4-5	S	2	1					1		X	X	
.30		1320	SB-16 9-10	S	2	1					1		X	X	~~Hold~~ 9B
.31		1325	SB-16 14-15	S	2	1					1		X	X	Hold
.32		1245	SB-17 5-6	S	2	1					1		X	X	
.33		1250	SB-17 9-10	S	2	1					1		X	X	
.34		1255	SB-17 14-15	S	2	1					1		X	X	Hold

12/21/2098

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Jana Beu X Sampler	DATE 12/21/20	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION	PM Storage	DATE 12/21/20	TIME 1600
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Matt Dodd	DATE 12/22/20	TIME 0715
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/22/20	TIME 1215

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12-22-20	TIME 1020

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.1 6

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Appendix F

PM ENVIRONMENTAL Environmental & Engineering Services

TYPAR 3201 & 3301 Specifications

TYPAR
LANDSCAPE PRODUCTS

PRODUCTS
DISTRIBUTOR MAP
WHAT'S NEW
PRESS RELEASES
REQUEST LITERATURE
REQUEST SAMPLES
CONTACT INFO
E-MAIL

Typar® Professional Landscape Fabric Specifications

Available in Standard & Heavy Grade Sizes:
3' x 50', 3' x 100', 4' x 50', 4' x 100',
3' x 300', 4' x 300', 75" x 300', 151" x 300'

Specifications Style 3201 & 3301:
Typar Professional Grade 100% Spunbonded
Polypropylene with UV inhibitors

SEARCH FOR:
Search Site
If you're a homeowner
If you're a gardening or landscaping professional
Easy installation

PROPERTIES	3201	3301
Unit Weight (oz/yds^2)	1.9	3.0
Tensile Strength(lbs)	73	135
Elongation at Break (%)	>70	>70
Puncture Strength (lbs)	23	35
Air Opening Size (equivalent sieve)	30/40	60/70
Air Opening Size (mm)	0.52	0.24
Trap Tear (lbs)	35	50
Air Permeability (cm/sec)	$10x10^{-2}$	$3x10^{-2}$
Flux ($gal/ft^2/min$)	200	70
Permitivity (sec^{-1})	3.0	1.2
Thickness	11.5	15.0
Color	Black	Black

TYPAR® Professional Landscape Fabric (3.0 OZ Black)


Retail & Bulk Rolls


Application

Conserves Water by Design

Landscape Contractor Approved

TYPAR® Professional Landscape Fabric (3.0 OZ Black)

Tough on Weeds. Healthy on Your Landscape.

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TYPAR® Professional Landscape Fabric allows you to block weeds around plants; unlike plastic, lets moisture, nutrients and air pass through; and is guaranteed to last for 20 years with proper installation and maintenance. Available in 3.0 oz. black.

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Looking to purchase DeWitt products for your landscaping project?

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www.dewittcompany.com
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Operations and Maintenance Plan for Exposure Barriers
3515 2nd Avenue, Detroit, Michigan

Instructions:

The inspection of the exposure barriers must be conducted at the intervals identified below which are specific to the type of barrier in place. Each inspection must include a walkthrough of the entire subject property to document the condition of the surface cover present, whether repairs are needed to ensure that dermal contact with underlying soils does not occur, and to document the actions taken to repair or replace the surface cover, including the timeline for repair replacement following identification of an issue.

The surface cover on the subject property consists of three main components depicted on the map on Page 3, including 1) the proposed building foundation; 2) areas of concrete (driveways, parking lot areas, and sidewalks); and 3) areas of 18" of combined topsoil (12"thickness) and wood mulch covering (6" thickness; installed above the 12" topsoil layer), with a landscape fabric at approximately 18" below ground surface.

Each area should be inspected for the following conditions with the results recorded on the inspection log included on Page 2:

Paved Surface Cover Areas: On a monthly basis, unless there is a continual snow cover present, inspect and record the condition of paved surface cover areas, including the existing building slab, areas of asphalt pavement, and areas of concrete pavement for pitting or cracks greater than 0.5", through which impacted subsurface soils could be readily accessed.

Similar to the non-paved inspection, if such conditions are identified, the pitting or cracks must be repaired with an equivalent surface cover (asphalt or concrete, or a commercially available asphalt or concrete patch/sealant) within 14 days of discovery. Records of any repairs must be included on the attached log included on Page 2.

Non-paved Surface Cover Areas: On a monthly basis, unless there is a continual snow cover present, inspect and record the condition of non-paved surface cover areas, if present in the area of impact, including the topsoil and wood mulch cover, for patches of exposed soils greater than six inches in diameter, indicating that the integrity of the surface cover is incomplete.

If such conditions are identified, the patches must be repaired with an equivalent surface cover (12" topsoil overlain by 6" of wood mulch with a landscape fabric demarcation barrier at approximately 18" below ground surface) within 14 days of discovery. Records of any repairs must be included on the attached log included on Page 2.

The landscape fabric demarcation barrier has a minimum service life of 20 years. 20 years after installation and annually thereafter, the landscape fabric demarcation barrier will be exposed and visually inspected to verify its condition and integrity. Records of any repairs must be included on the attached log included on Page 2.

If repair/replacement of paved and non-paved surface cover areas, including the landscape fabric demarcation barrier, is not feasible within the required 14 day timeframe, the area(s) must be temporarily covered with anchored plastic sheeting, anchored landscaping fabric, or anchored plywood, as appropriate until a permanent repair/replacement is installed. Records of any temporary repairs or surface cover installation must be included on the attached log included on Page 2.

Inspection Form for Exposure Barriers
3515 2nd Avenue, Detroit, Michigan

Provide further description and comments, if necessary, on a separate sheet of paper and attach to this sheet. **Any item that receives "yes" as an answer must be described and addressed.**

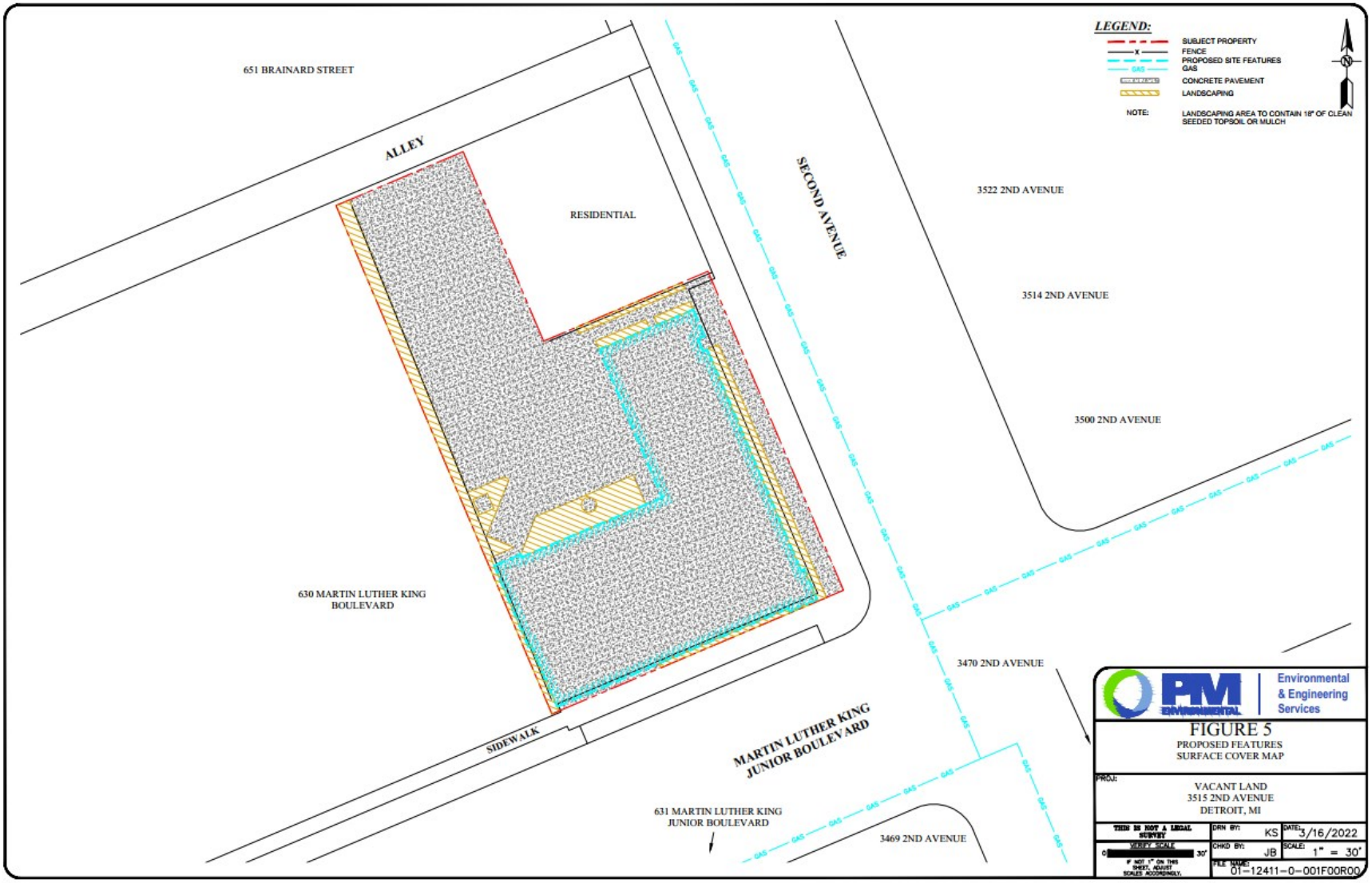
Dermal Contact Exposure Barrier Type	Y	N	Date of Inspection, Description & Comments, Summary of Actions Taken
Areas of Pavement or Building Foundation Cover			
Are any pavement/building foundation exposure barriers pitted, cracked, or damaged (0.5" or greater) such that underlying soils are exposed?			
Do any pavement/building foundation exposure barriers contain significant cracking (0.5" or greater) such that underlying soils are exposed?			
Are any other pavement/building foundation exposure barrier conditions present that affect their integrity such that underlying soils are exposed?			
Non-Paved Surface Cover			
Is the topsoil/mulch landscaping cover missing or damaged (6" diameter or greater) such that underlying soils are exposed?			
Are conditions apparent that indicate that the thickness of non-paved exposure barriers (12" of topsoil overlain by 6" of wood mulch) has been significantly reduced (i.e., erosion, surface depressions, etc.)?			
To be conducted 20 years after landscape fabric installation and annually thereafter *Are conditions apparent that indicate that the integrity, condition, or continuous coverage of the landscape fabric demarcation barrier has been significantly reduced or has resulted in underlying soils to be exposed (i.e. cuts, fraying, missing areas of landscape fabric)?*			

Additional Remarks:

Date: _____ **Signature: _____**

Inspection Form for Exposure Barriers
3515 2nd Avenue, Detroit, Michigan

Map of Subject Property Exposure Barrier Areas



Appendix G

PM ENVIRONMENTAL Environmental & Engineering Services

MODEL DOCUMENT – NOTICE TO CONSTRUCTION AND UTILITY CONTRACTORS

Date

Addressee
Addressee Title
Address Line 1
Address Line 2

RE: Notice to Construction and Utility Contractors Working at the Property Located at 3515 2nd Avenue, Detroit, Wayne County, Michigan

Dear Addressee:

MLK on 2nd Limited Dividend Housing Association, LLC is providing written notice to construction and utility contractors working at the subject property to satisfy the reporting requirements in accordance with Michigan Department of Environment, Great Lakes, and Energy (EGLE) due care obligations under Section 20107a of Part 201 of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994 (Part 201), as amended.

The subject property is a "facility" as specified in Section 20120a(1)(a) or (17) in Part 201 based on the analytical results of soil and soil gas samples collected during subsurface investigation. Contaminants have been identified on the subject property at levels that represent an exposure hazard via the direct contact and volatilization to indoor air inhalation exposure pathways.

All contractors who may work sub-grade within contaminated area of the subject property, including excavation contractors and utility employees, are advised to take appropriate safety precautions when working within the contaminated areas of the subject property. Training in accordance with 29 CFR 1910-210, personal protection equipment, and site safety plans may be necessary in the event that subsurface work is completed in the contaminated areas of the subject property. Additional documentation concerning the existing subsurface contamination is available upon request.

Please contact us at (XXX) XXX-XXXX if you have any questions or require any additional information.

Sincerely,

Name
Title

Appendix H

PM ENVIRONMENTAL Environmental & Engineering Services

PM ENVIRONMENTAL
Risk Well Managed

Environmental & Engineering Services Nationwide

ENVIRONMENTAL SERVICES

BUILDING ARCHITECTURE, ENGINEERING & SCIENCE

INDUSTRIAL HYGIENE SERVICES

BROWNFIELDS & ECONOMIC INCENTIVES CONSULTING

Know Your Risk.
Take Control.
Work with the Experts.

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2022 DESIGN AND SPECIFICATION PACKAGE FOR SUB-SLAB DEPRESSURIZATION SYSTEMS

Proposed Subject Property
3515 2nd Avenue | Detroit, Michigan
PM Project Number 01-12411-2-0002

Prepared for:

MLK on 2nd Limited Dividend Housing Association LLC
23600 Telegraph Road, Suite 102
Bingham Farms, Michigan 48025

Prepared by:

PM Environmental, Inc.
4080 West Eleven Mile Road
Berkley, Michigan 48072

PM ENVIRONMENTAL
Risk Well Managed

Corporate Headquarters
Lansing, Michigan
3340 Ranger Road, Lansing, MI 48906
f: 877.884.6775
t: 517.321.3331

Michigan Locations
Berkley **Lansing**
Grand Rapids **Oak Park**
Flint

August 12, 2022

Mr. Fadi Nassar
MLK on 2nd Limited Dividend Housing Association LLC
23600 Telegraph Road, Suite 102
Bingham Farms, Michigan 48025

Re: Design and Specification Package for Sub-Slab Depressurization Systems for the Proposed Subject Property Located at 3515 2nd Avenue, Detroit, Michigan
Parcel ID: 04000689-90
PM Environmental, Inc. Project No. 01-12411-2-0002

To Whom it May Concern:

PM Environmental, Inc. (PM) has prepared this design and specification package for installation of the proposed Sub-Slab Depressurization System (SSDS) as a vapor intrusion (VI) mitigation solution for the above referenced proposed buildings at the vacant land property located at 3515 2nd Avenue, Detroit, Michigan. The SSDS is designed in general accordance the Michigan Department of Environment, Great Lakes, and Energy (EGLE) VI Guidance Document and standard industry practices.

If you have any questions regarding the information presented in this design report, please contact us by phone at 800.313.2966.

Sincerely,
PM ENVIRONMENTAL, INC.

REPORT PREPARED BY

Keith Sheridan
Staff Engineer

REPORT REVIEWED BY:

Jogesh C. Panda, PE
Senior Engineer & Project Manager

Enclosure

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

This Design and Specification Plan (PLAN) for Sub-Slab Depressurization System (SSDS) was prepared on behalf of MLK on 2nd Limited Dividend Housing Association LLC for the proposed subject building (Parcel ID: 04000689-90) located at 3515 2nd Avenue, Detroit, Wayne County, Michigan 48201 (hereafter referred to as the "subject property"; Figure 1).

Concentrations of contaminants of concern (COCs) in soil and/or soil gas exceed the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Site-Specific Volatilization to Indoor Air Criteria (SSVIAC) issued on March 21, 2022, and as reported in the Phase II Environmental Site Assessment (ESA) prepared in 2021. This indicates a vapor intrusion (VI) risk for the building proposed to be redeveloped within the footprints or within the exclusion zones of the above impacted areas, which require mitigation.

The proposed development on the subject property includes construction of a new mixed use residential/commercial multi-story slab-on-grade building. The development of this building includes pouring the foundation footings and a concrete slab as in the case of new construction buildings. It was determined that an SSDS with AASHTO #57 aggregates sandwiched between two vapor barrier/retarder membranes beneath the slab for the subject property building would result in the most effective vapor intrusion mitigation system from both a technical and economical perspective.

This Design and Specification Plan outlines the design and construction details and specifications for installation of the SSDSs for the proposed building on the subject property. The SSDSs presented in this report are designed to meet the minimum threshold vacuum level of 0.02 inches of water column (WC) beneath the concrete floor slab of the building and prevent migration of subsurface volatile organic compound (VOC) vapors into the indoor air space of the building (Appendix A Sheet VIM-2). These proposed SSDSs are intended to serve as the Soil Gas Control Systems for the buildings by providing an alternative preferential pathway for soil gas from within sub-slab to bypass the subject property building and discharge into the atmosphere. Installation of the SSDSs will minimize potential VI exposure risks from the VOC impacted soils beneath and within the Lateral Exclusion Zone to the indoor environment of the proposed building.

Performance monitoring procedures (Section 5.0) and contingency metrics (Section 5.2) are provided to monitor and document the performance of the SSDSs as per their designed objectives. Samples will be collected from each stack during system startup and a permit evaluation will be completed at that time; however, preliminary evaluation shows that the emissions from the SSDSs will be exempt from Permit to Install.

This design and specification plan has been completed in general accordance with EGLE guidance, industry standards, as well as federal, state, and local building codes by PM Environmental.

1.1 Subject Property Description

The subject property consists of one parcel of land totaling 0.356 acres and is located on the northwest corner of Martin Luther King Jr. Boulevard and 2ND Avenue, in Detroit, Wayne County, Michigan (Figure 1). The subject property is currently vacant and contains areas of gravel and grass. The northern portion of the property is surrounded by chain-link fence (Figure 2).

According to standard and historical documentation within ASTI Environmental's (ASTI) April 2020 Phase I ESA, the subject property was developed from at least 1889 to 1921 with two residential dwellings. By at least 1926 the east dwelling was demolished and a gasoline filling station with two underground storage tanks (USTs) was present, which are identified in the 1950 and 1953 Sanborn maps. By 1957, the western dwelling and gasoline filling station were demolished and replaced with a building on the western portion of the subject property, which was identified as a gasoline filling station from at least 1957 to 1977. From at least 1967 to 1995, in addition to gasoline filling operations, the site operated as a tire and battery service and automobile service shop and used car sales lot. The building became vacant sometime after 1995 and was demolished in 2018.

The subject property consists of one parcel (Parcel ID: 04000689-90) totaling 0.36 acres and is shown in Figure 1.

1.2 Intended Use of the Subject Property

MLK on 2nd Dividend Housing Association LLC intends to develop the subject property with a mixed use residential and commercial multi-story building.

The subject property is currently zoned SD-2: Mixed Zoning, which is consistent with a Residential property use in accordance with Part 201.

Municipal water, sanitary sewer, natural gas, electrical, and telecommunications utilities are available at the subject property. No water wells are currently present on the subject property and none will be installed at the property in the future.

1.3 Locations of SSVIAC Exceedances

Refer to Appendix G, which includes sample location figures for soil and soil gas along with a summary of the COCs exceeding the SSVIAC.

Also refer to Figure 3 of this report, which depicts the extent of soil and soil gas SSVIAC exceedances.

2.0 SUMMARY OF SSDS DESIGN PARAMETER DETERMINATION THROUGH AIRFLOW MODELING

The SSDS design parameters such as vacuum to be applied, expected radius of influence (ROI), and airflow were developed using a spreadsheet model simulating extraction from a suction pit in a specified permeable layer (aggregate layer) underlain by the concrete slab and overlain by the subgrade soils. The results of the airflow model calculations are summarized below.

Due to this being a new construction, a pilot test could not be conducted to obtain a relationship among the design parameters such as vacuum, ROI, and airflow for designing the SSDS for the building. A spreadsheet model was used to compute relationships among applied vacuum, ROI, and airflow for the specified AASHTO #57 aggregates in the air permeable layer and the sub-grade soil type scenario. The model assumed laminar air flow in the air permeable layer (aggregate layer) to the suction pit. Solutions to a point sink in an infinite horizontal permeable layer underlain by a leaky sub-grade layer from where air would enter (leak into) the permeable layer was used to simulate the vacuum and airflow and ROI was determined to be the radial

distance where threshold vacuum level of 0.02 inches of WC was computed. It was assumed that all air entered the permeable layer from the sub-grade soils to a depth of up to 6 inches below the foundation footing to conservatively calculate the ROI for a given vacuum level. Pneumatic conductivity for the air permeable layer (specified aggregate layer) was determined using published empirical relationships between the particle size distribution and permeability. Pneumatic conductivity for airflow for the sub-grade soils were determined from the published maximum values of hydraulic conductivity for the soil type. Maximum value was used to obtain a conservative estimate of airflow (maximum expected air flow at a given applied vacuum). Boring log data was used to determine the soil type beneath the subject property. The model output depicting the projected vacuum-ROI-airflow relationship is shown on the figure included in Appendix B. At a design vacuum of 1 inch of WC, a ROI of 74 feet, and airflow of 10 cfm was determined from these computations. A factor of safety of 0.7 for ROI and a factor of safety of 1.3 for airflow was used in the calculations to be conservative (lower than expected ROI, and larger than expected airflow). Refer to Sheet VIM-2 in Appendix A to see the resulting extraction locations implemented into the design with overlaps to allow for an additional factor of safety.

3.0 SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN

American National Standard Institute (ANSI)/ American Association of Radon Scientists and Technologies (AARST) Standard CC-1000 (2018) – *Soil Gas Control Systems in New Construction of Buildings* were used to develop the SSDS design and specifications for the proposed building. The design parameter values discussed in Section 2 of this report were also used to provide an engineering basis for the design. System specifications and construction details for installation of the SSDSs are also included in this report. A copy of the EGLE *Checklist for Review of and Active Mitigation System Design* (Appendix C.5 of the *Guidance Document for the Vapor Intrusion Pathway*), May 2013, MDEQ Remediation and Redevelopment Division with references to the pertinent sections in this design document is included in Appendix C.

Details of the SSDS are specified in the following sections and within the attached set of detail drawings (Appendix A). The SSDS details with respect to the proposed subject property building floor plans and foundation plans are included in Appendix A Sheet VIM-2.

SSDS suction pits, ventilation piping, and test port locations are included on Sheet VIM-2 of Appendix A.

Appendix A Sheet VIM-3 is the first-floor plan. It contains the layout of the first floor with the location of monitoring test ports and the SSD riser locations.

Appendix A Sheet VIM-4 is the second-floor plan. This sheet shows the layout of the second floor with SSD riser locations.

Appendix A Sheet VIM-5 is the roof plan. This sheet shows the roof layout, the exact location of each fan, and the radius around the fan in which no opening, vent, or air intake can be located.

Appendix A sheet VIM-6 are construction details. These details show specifics for installation such as how to lay out the vapor barrier, how the fan mounts on the roof, the correct layout for sub-slab piping, sealing details, elevator pit, etc.

Appendix A sheet VIM-7 is a design for sub-slab vacuum test ports. This shows how the test ports below the slab should be installed.

Appendix A sheet VIM-8 contains an elevator pit detail. This detail shows how the elevator must be installed with the vapor barrier.

Appendix A sheets VIM-9 and VIM-10 contain details from STEGO. These sheets show the different ways STEGO wrap is to be installed for different situations in buildings.

The proposed design has built-in safety factors in fan sizing to account for the anticipated worst-case operating scenarios.

3.1 VI Mitigation Approach, Design Criteria and General System Information

The method proposed to mitigate VI into the proposed buildings at the subject facility is to install SSDSs to create a negative pressure differential between the sub-slab and indoor air spaces of the buildings. The SSDSs will serve as the primary VI mitigation barriers to ensure effective and efficient operation as well as provide additional VI mitigation. An SSDS works by applying vacuum to the sub-slab space and exhausting the collected soil gas from below the building to the atmosphere outside above the roofline.

The SSDSs for the proposed building are largely comprised of suction pits made with tees, solid sub-slab conveyance piping connecting the suction pits, vertical riser piping, horizontal piping manifolds as needed and the main pipe to the fans mounted on the roof top of the proposed buildings. Each fan is equipped with an alarm system to notify the responsible parties if the fan loses vacuum for any reason. The vertical riser piping is taken through demising walls to keep them hidden when possible. The number of suction pits and the fan sizing are based on the design vacuum-ROI-airflow relationships discussed under Section 2 to ensure complete vacuum coverage under the sub-slab air space of the building. The building, which will have a new concrete slab, will have a 6” thick highly permeable coarse aggregate layer as specified and the conveyance piping with the suction pits consisting of tees will be laid in the aggregate layer.

The extraction piping network is comprised of 4-inch diameter Schedule 40 PVC piping.

The design for this building also meets the design criteria in the ANSI/ AARST Standard CC-1000 (2018) – *Soil Gas Control Systems in New Construction of Buildings*. This document provides minimum requirements for the construction of vapor intrusion mitigation systems in any building intended for human occupancy, except for 1 and 2 family dwellings, to help reduce occupant exposure to radon and other hazardous soil gases. Specifically, the design utilizes Section 4 of this document, which addresses soil gas collection plenums (SSDS systems). Based on the standards provided, the following table identifies the credit allowance for inspected plenums using the proposed method in this design:

AARST Square Foot per Extraction Riser Design Criteria

Table 4.3 Continued

4.3.2 **Credit Allowance for Inspected Plenums**	
If inspections in accordance with Sections **5.10.2** and **6.5** are conducted and verify compliance with Sections **5** and **6**, the maximum size of *Soil Gas Collection Plenum(s)* for these duct sizes shall be:	
Nominal inside pipe diameter	Maximum nominal size of *Soil Gas Collection Plenum(s)* per duct size
3 inch (7.6 cm)	3,500 square feet (325 m^2)
4 inch (10.2 cm)	6,200 square feet (575 m^2)
6 inch (15.2 cm)	14,000 square feet (1,300 m^2)

The assessed square footage of the building encompassed in this design dictate that there is sufficient coverage of the building footprint based on the number of suction pits and venting pipe diameter. Four (4) -inch diameter piping will be used throughout the system. Below is a summary Table for the Design Criteria for the projected air flow, vacuum, and power consumption for each system to be installed:

- The blowers in each application have been sized to achieve a minimum 0.02-inch WC vacuum across the entire slab footprint.

For sizing of power supply circuits, best practices dictate that the maximum power consumption of the blower be provided for, with the understanding that the system will use only the amount power needed based on site conditions. Maximum wattage for a GBR 89 is 1,000 W. This fan is appropriately sized for the required design. Refer to Appendix D for fan information specific to each site.

In the case of power outages, all fans are connected to non-switch circuits. Because of this, when the power in the buildings come back on, the fans will come back on as well without the switches requiring to be manually switched. In other words, the fans will be hard wired. There will be system setting labels be included on all the fans. Also, fans and alarms will be on different circuits from each other.

3.2 Aggregate Ventilation Zone

In order for the system to function efficiently a continuous layer of ¾ inch AASHTO graded #57 stone with a minimum depth of 6 inches shall be installed below all building slabs in contact with the ground. (AASHTO #57 coarse aggregate stone has 100% passing 1 1/2" screen, 95-100% passing 1" screen, 25-60% passing 1/2" screen, 0-10% passing #4 screen, and 0-5% passing #8 screen).

3.3 Vapor Barrier

A minimum 10 mil vapor retarder or equivalent shall be installed below the gravel bed. The vapor retarder under the gravel bed shall not be sealed or have overlapping edges to allow water

drainage, it should terminate at foundation walls or adjacent slabs. A minimum 15 mil vapor barrier or equivalent shall be installed above the gravel bed. This vapor barrier installed on top of the gravel bed prior to the installation of the slab shall be overlapped at least 12 inches and have the top overlap tapped to the underside layer using four-inch-wide tape designated for this application. The tape shall be centered over the top layer edge. The barrier on top of the gravel bed shall be installed so that it is abuts the perimeter foundation wall. Any penetrations of the upper layer membrane shall be sealed airtight using the membrane tape.

3.4 Elevator Pit

As part of the building design, the new elevator pit had to be designed to prevent soil gasses from entering the building. Since this is a new construction building, achieving this goal can be done by placing a vapor barrier in the elevator pit. The elevator pit is lined with a CETCO vapor barrier that will be covered by eight-inch concrete walls surrounding the elevator pit. The elevator pit will also contain an internal elevator sump that is lined with polyurethane liner. The cylinder mount within the elevator pit will be sealed with a 100-MIL vapor barrier application. All these features and details are shown on the Sheet VIM-8 elevator pit detail and on the conceptual site model Figure 4.

3.5 System Piping

The piping installed below the slab shall be a 4-inch diameter solid PVC (polyvinyl chloride) conforming to ASTM D-2729 (sewer & drain). The piping installed above the slab shall be 4" diameter Schedule 40 PVC (polyvinyl chloride) conforming to ASTM D-1785. The drawings provided show the locations of the sub slab piping and vertical riser locations. Sub Slab Depressurization System Design 3515 Second Ave, Detroit, Michigan Page 4 of 5 2969 Route 23 South Newfoundland, NJ 07435 / 1-800-949-OBAR / www.obarsystems.com All sub slab piping installed shall be solidly bedded below the slab with a minimum of 1-inch of stone base under the piping and a minimum of 1-inch of stone base on top of the piping. Sub slab piping shall have full bearing for each pipe section throughout its length, installed dead level, straight, and in true alignment. For solid sub slab piping, a ½" diameter hole should be drilled in the bottom of the pipe every 10 feet to allow for condensate drainage. Provide PVC couplings and fittings as required.

Sub slab piping routed across unsupported areas prior to installation of thickened slabs or foundation walls shall be placed inside larger diameter schedule 40 PVC piping sleeves that has minimum of 12-inch bearing on either end.

Contractor shall determine exact riser position of soil venting pipe riser installed in the gravel so that it aligns with appropriate riser location up through the building. All vertical risers shall be 4-inch schedule 40 PVC. Horizontal pipe runs are permitted within the building or the attic as required but all pipes must be pitched back to the slab penetration with at least a one inch pitch for every 10 feet of piping. Soil vent stack piping shall be anchored to building structure at floor intersections and at intermediate locations no greater than every 8 feet of vertical rise and no greater than every 6 feet of horizontal run to prevent movement or rattling of piping network. Supports and anchors shall be clamps and brackets compatible with piping materials.

Above grade vent piping shall be clearly labeled a minimum of every 8 feet with at least one label on each floor. The label shall read "Caution: Vapor Control System" or equivalent. Fan exhaust shall be labeled "May Contain Volatile Organic Compounds".

Refer to Appendix A Sheet VIM-6 for all the specific details related to the piping for the subject property.

3.6 Extraction Fans

In an SSDS application, the extraction fans must be designed to run perpetually at a 100% duty service interval to maintain the negative pressure barrier under the building slab. To accomplish this, the fans need to be properly sized and specified for the anticipated load and operating environment. They must also be capable of operating at variable speeds to allow adjustment for a number of site-specific factors. The table included above in Section 2.1, outlines the proposed fans for each building and building zone. These Fans have been specified to accommodate the range of conditions expected, to operate at a 100% duty cycle and to be placed outside on the building roof.

The mitigation fans to be installed are OBAR GBR89 or equivalent fans. The fan's exhaust must be at least 20 feet from any door, window, HVAC intake, or other direct opening into the building where possible. The fan specified for the SSDS is not anticipated to cause any back-drafting of the building's utilities.

The incorporation of a designed ventilation zone, for an effective and efficient application of vacuum across the field and provides a higher level of certainty in the operational characteristics of the extraction fans and subsequently the SSDS. Manufacturer's specifications and information for the GBR-89 fan can be found in Appendix D. The head loss calculations performed to clarify these values can be found in Appendix B. These fans were chosen based upon their long history of superior performance in these applications and their vacuum/flow characteristics which match the designed site conditions.

3.7 Vacuum and Soil Gas Monitoring and Alarms

<u>Vacuum Monitoring Test Ports</u>

Sub-slab vacuum monitoring ports will be installed within the building's footprint at the extent of the expected radius of influence of the SSDS extraction points to confirm sub-slab vacuum field. Proposed monitoring port locations are shown on Appendix A Sheet M-2. Due to the residential nature of these buildings, the vacuum monitoring is required to be remote as accessing traditional sub-slab Vapor Pin type monitoring points is not logistically feasible.

These sub-slab monitoring points will be installed under the slab in the SSD Ventilation zone. They will consist of a ceramic soil sampling point, attached to ¼ inch flexible polyethylene tubing. The tubing will run back inside of a 1-inch PVC pipe to the monitoring console in the Mechanical Room in each building. The 1-inch PVC conduit will run under the slab along the wall of the mechanical room.

Vacuum monitoring points as well as flow measurement ports will be installed at each fan to allow remote monitoring of each fan's operation. Obar digital pressure transmitter's will be connected to the GBR 25 Alarms which will be installed in the monitoring console in the Mechanical Room in each building. Details of these devices can be found in Appendix F.

System Alarms

Active mitigation systems require an alarm and visual vacuum monitor. A gauge capable of providing the applied vacuum will be installed on each monitoring point (GBR-25R or equivalent gauge). Each visual vacuum monitor will be paired with a telemetry system to provide remote monitoring (GBR-25R paired with an EDG 0-10 Wireless sensor sender that will transmit to a 4G LTE EDG Gateway or equivalent). Cut sheets for remote monitoring equipment are attached in Appendix F.

There will be two alarm units installed in the building to go with the two fans. Each unit consists of a sensor unit which senses vacuum loss in the main influent pipe leading to the fan and a transmitter that transmits the digital signal to a base station located within 1000 feet or less. The transmitters must be installed no closer than 5 feet from each other. Each alarm unit is also equipped with a digital vacuum gage. All the alarm locations can be seen in Appendix A on Sheet VIM-2. The base station will be located in the electrical room and will be programmed to alert the responsible party/parties to address any alarm conditions that occur.

3.8 Roof Penetrations

Roof penetrations will be coordinated between the mechanical trades running the SSDS riser pipes and the roofing trades and performed and sealed according to the roofing material specifications. The SSDS extraction pipe should terminate no less than 18 inches above the roofline and no less than 10 feet from the outer edge of the roof and 20 feet from any door, window, HVAC intake, or other direct opening into the building where possible. In the event a discharge location is within 20 feet of a building opening, that discharge will be raised to a minimum of 3 feet above the top of the opening in question.

3.9 Concrete Sealing

If the ground contact concrete slab abuts against a foundation wall or other surface that produces a cold joint, a peel off expansion joint material shall be installed continuously around the outer edge of the slab. The peel off expansion strip shall be installed so that the top of the strip is flush with the concrete slab, the strip should be installed using adhesive or mechanical fasteners. The peel off strip shall be between 3/8-inch and 3/4-inch in width. All peel off expansion joint material shall have the upper peel off section removed and the void space filled with non-cracking polyurethane caulk complying with ASTM C920 class 25 or higher, or equivalent. Details for acceptable products for these purposes are found in Appendix F.

All visible cracks and control joints in interior concrete slabs that are greater than 1/16" in width shall be sealed utilizing a non-cracking polyurethane caulk complying with ASTM C920 class 25 or higher, or equivalent. Joints, cracks and saw cuts shall be swept or vacuumed clean before application of any sealant. Use caulking manufacturer’s recommendations for installation of caulking for concrete slab floors. Any perimeter or interior joints to be sealed shall have any concrete ridges protruding above the slab height removed prior to sealing. The specified concrete slab sealing shall be done at least 30 days after concrete slab has been installed. Sealant details can be found in Appendix F.

Other larger openings through the slab that are open to the sub slab or soil such as plumbing penetrations, sump pits or plumbing block outs shall be sealed with durable material so as to be airtight. Sump pits open to sub slab soil shall have airtight lids. Openings in or around sump covers

shall be sealed with a gasket or use of silicone caulking to allow easy removal for sump pit for maintenance. Sump pits that have a sump pump shall have an access port in the sump pit cover to allow checking of the sump pump without needing to remove the cover.

3.10 Electric Service to SSDS

Mitigation fans will require a dedicated 240V breaker. A licensed electrician should perform all specified electrical work. Mitigation fans may share a breaker with one another. Breakers for mitigation fans should be labeled "VOC Do Not Turn Off". The system alarm and other SSDS related monitoring equipment should be installed on a separate circuit from the mitigation fans.

The mitigation fans to be installed are outlined below. The fan's exhaust must be at least 20 feet from any door, window, HVAC intake, or other direct opening into the building where possible or elevated at least 3 ft above the opening in question. Fan installations shall use roof mounted structures specifically made for the fan and roof application. A roof mount is included on Sheet VIM-6 of Appendix A and in Appendix D.

4.0 SSDS INSTALLATION AND TESTING

Upon completion of the building and prior to occupancy, the SSDS will undergo operational proveout to ensure that the operating fans achieve the minimum 0.02-inch W.C. vacuum requirement at the test port locations. The system will be turned on, fan speeds adjusted for optimum performance and vacuum and flow measurements will be collected under normal building HVAC operating conditions, this includes measuring and recording initial pressure readings in both the vacuum monitoring test ports and risers. System fan speeds will be adjusted to provide the most efficient application of vacuum to achieve the design requirements. Documentation of the operational prove-out process and results will be completed and included in the final As-Built Completion and Start-Up Report.

SSDS Commissioning

This section outlines the initial start-up and monitoring of the SSDS performance for one year after start-up. This plan includes detailed procedures to be conducted during each monitoring event at the subject property building including:

- Exhaust air from each of the three proposed fans will be sampled and analyzed for VOC using the TO-15 method and air permitting status will be evaluated as required by AQD.
- During initial commissioning, the two SSD zones will be run individually to verify the radius of influence/vacuum field generated by each because the system was installed as part of a newly-constructed structure with a newly installed foundation and utility layout such that the zone-approach to verifying the vacuum field is appropriate, with no point by point evaluation needed.
- Initial dally monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02 in WC at all testing points for one week at system startup.
- Weekly monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02" WC at all testing points for the first month.
- Monthly monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02" WC at all testing points for the first Quarter.

- Quarterly monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02" WC at all testing points for the remainder of the first year.
- The Performance Monitoring Events will include the following items:
    - Inspection of SSDS components including fan operation and exposed riser pipes
    - Collection of vacuum and flow measurements at each fan
    - Verification of monitoring system, alarm and telemetry system operation, and Inspection of any repaired or sealed cracks as part of the final design of the SSDS.
    - Inspection of the emergency generator systems for proper operation.
- An operation, maintenance, and monitoring (OM&M) plan and as-built drawings of the final installed SSDS will be completed.
- Inspection frequency from quarterly (four times per year) to annually (once per year) will be changed after four quarters of monitoring shows the threshold minimum vacuum of 0.02 in WC is met at each of the performance monitoring test ports.
- Exhaust air monitoring and exhaust discharge calculations as required by AQD.

The order of contingency actions if the system function deviates from the design specifications are treated as follows. When arriving at the subject property, PM will record weather conditions on the SSDS Performance Monitoring Inspection Log. Figures depicting the specifics of all fans, testing ports, alarms, and other components as well as figures showing the entire layout of the SSDS to be provided.

If an alarm condition occurs, the Site manager will take necessary action to schedule evaluation and repairs immediately and/or within 24 hours. Repairs are to be initiated as soon as feasible within 48 hours of SSDS evaluation. With the primary SSDS, a factor of safety exists for making repairs/restart the SSDS. Contact procedures for service inquiries and mitigation professional responsible for protocols will be included in the OM&M Plan.

When SSDS is installed, diagnostic testing will be completed to document that the system vacuum meets design specifications. If system vacuum does not meet design specifications, then the system will be modified as needed to meet them. This includes installing vacuum monitoring test ports within the building floor to document system performance, as determined by the SSDS design professional. System commissioning activities (i.e. daily, weekly, monthly, etc.) will restart if SSDS system modifications are made. A SSDS commissioning log is included in Appendix E.

5.0 QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC)

The SSDS installation activities will be conducted in accordance with manufacturer recommended procedures (refer to Appendix C-F). The following QA/QC procedures will be conducted during SSDS installation and prior to building occupancy to document that the system is performing within design specifications:

- After the subject property building construction is completed and the building is occupied operational prove-out performance monitoring of the SSDSs will be conducted in each building zone to document that the SSDSs are operating per the design specifications. SSDS commissioning/performance monitoring will be completed in accordance with the schedule laid out in Section 4.0.

- After the first year of progressive daily/weekly/monthly/quarterly performance monitoring recorded on the log attached in Appendix E, if the SSDS is documented to function as designed, the monitoring frequency will be updated to annual (one event per year). Documentation of the QA/QC activities listed above will be included in a summary report submitted to owner following completion of the SSDS installation (refer to Section 4.0).

5.1 Documentation and Reporting of Performance Monitoring Results

Documentation of the performance monitoring activities will be included in a summary report submitted to owner following completion of Year One performance monitoring inspection period (refer to Section 4.0).

5.2 Contingency Plan

After the first year of commissioning/performance monitoring activities is completed, if the performance monitoring documents that the SSDS is consistently meeting design objectives (i.e., 0.02 inches of WC vacuum across the slab footprint), then the performance monitoring period will be increased to annual (once per year). Performance monitoring in perpetuity, with no soil gas monitoring required after the first year of performance monitoring. Annual performance monitoring will be the same as the quarterly performance monitoring but will be completed during the third quarter of each calendar year for vacuum and alarm conditions. After the first year of quarterly performance monitoring, the monitoring frequency will be updated to annual monitoring in perpetuity as long as all system operational parameters meet the design expectations.

If any time after system startup and prove out or after the first year of performance monitoring activities is completed the performance monitoring documents that the SSDS is not meeting design objectives (i.e. 0.02 inches of WC vacuum across the slab footprint), then the extraction fan operation will be adjusted to create a higher vacuum field and the frequency of the SSDS performance monitoring activities, for said SSD Zone, will be increased to be quarterly for one year for the affected SSD Zone, using initial contingency metrics for changes in frequency. Following four consecutive quarters of meeting defined SSDS design objectives, then the annual frequency of performance monitoring activities, for said SSD Zones, will resume as annual for the previously affected SSD Zone. In the event that fan adjustments do not resolve performance issues, additional extraction points will be added in the zones affected and monitoring performed to verify restored performance.

System commissioning activities (i.e. daily, weekly, monthly, etc.) will re-start per the schedule included in Section 4.0 if SSDS system modifications are made.

6.0 CONSTRUCTION MANAGEMENT AND REPORTING

The SSDS installation activities will be conducted by a manufacturer-certified installer in accordance with a Site-Specific Health and Safety Plan (HASP) prepared for the subject property. PM will provide construction oversight during the performance of the work, including project kickoff, milestone inspections, QA/QC testing and system startup and prove out activities. PM will provide initial system startup support and collection of sub-slab vacuum data and SSDS operational data to ensure the system meets its design objectives.

Within 90 days following completion of SSDS installation and startup activities, a written report will be prepared to document the system installation. The report shall include as-built drawings, a summary of post-installation smoke testing and performance measurement activities/results, and

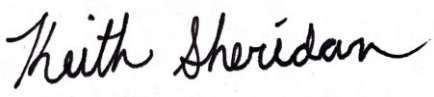
a Performance Monitoring Plan, identifying activities that will be conducted to ensure the SSDS is operated in an effective manner consistent with its design specifications.

Occupants of the subject buildings described herein will be provided the following notice in the lease agreement prior to occupation. Lessees will be required to sign an acknowledgement sheet containing the notice, a copy of which will be furnished to the lessee for their records.

"Contaminated subsurface vapors are present at this property. The building at the property is equipped with a sub-slab depressurization vapor control system that prevents the contaminated sub-surface vapors from entering the building structure. No modification to the building structures or building components including, but not limited sub-slab depressurization system components, floor slabs, foundations, walls, pluming or piping, electrical system components, backup generators, ventilation systems, roofing, or utilities is permitted."

If you have questions regarding this work plan, please contact PM at 800.313.2966.

PM ENVIRONMENTAL, INC.
REPORT PREPARED BY



Keith Sheridan
Staff Engineer

REPORT REVIEWED BY:

Jogesh C. Panda, PE
Senior Engineer & Project Manager

REFERENCES

- Table 1. Groundwater: Residential and Nonresidential, Part 201 Generic Cleanup Criteria and Screening Levels, Updated December 21, 2020.
- Table 2. Soil: Residential, Part 201 Generic Cleanup Criteria and Screening Levels and Part 213 Risk-Based Screening Levels, Updated June 25, 2018.
- Table 3. Soil: Nonresidential, Part 201 Generic Cleanup Criteria and Screening Levels and Part 213 Risk-Based Screening Levels, Updated June 25, 2018.
- EGLE Volatilization to Indoor Air Pathway Screening Levels, September 4, 2020.
- EGLE Operational Memorandum No. 4 “Site Characterization and Remediation Verification – Attachment 10, Peer Review Draft Groundwater Not in an Aquifer,” February 2007.
- EGLE Operational Memorandum No. 2 “Sampling and Analysis,” October 22, 2004, Revised July 5, 2007.
- DEQ Checklist for Reviewing the Design of an Active Mitigation System, dated May 2013.
- Phase I ESA, Aril 7, 2020, ASTI.
- BEA, October 15, 2020, PM.
- Phase II ESA, January 28, 2021, PM.
- American National Standard Institute (ANSI)/ American Association of Radon Scientists and Technologies (AARST) Standard CC-1000 (2018) Soil Gas Control Systems in New Construction of Buildings
- EGLE Guidance Document for the Vapor Intrusion Pathway (May 2013, as amended); Appendix C.5 Checklist for Reviewing the Design of an Active Mitigation System

Figures

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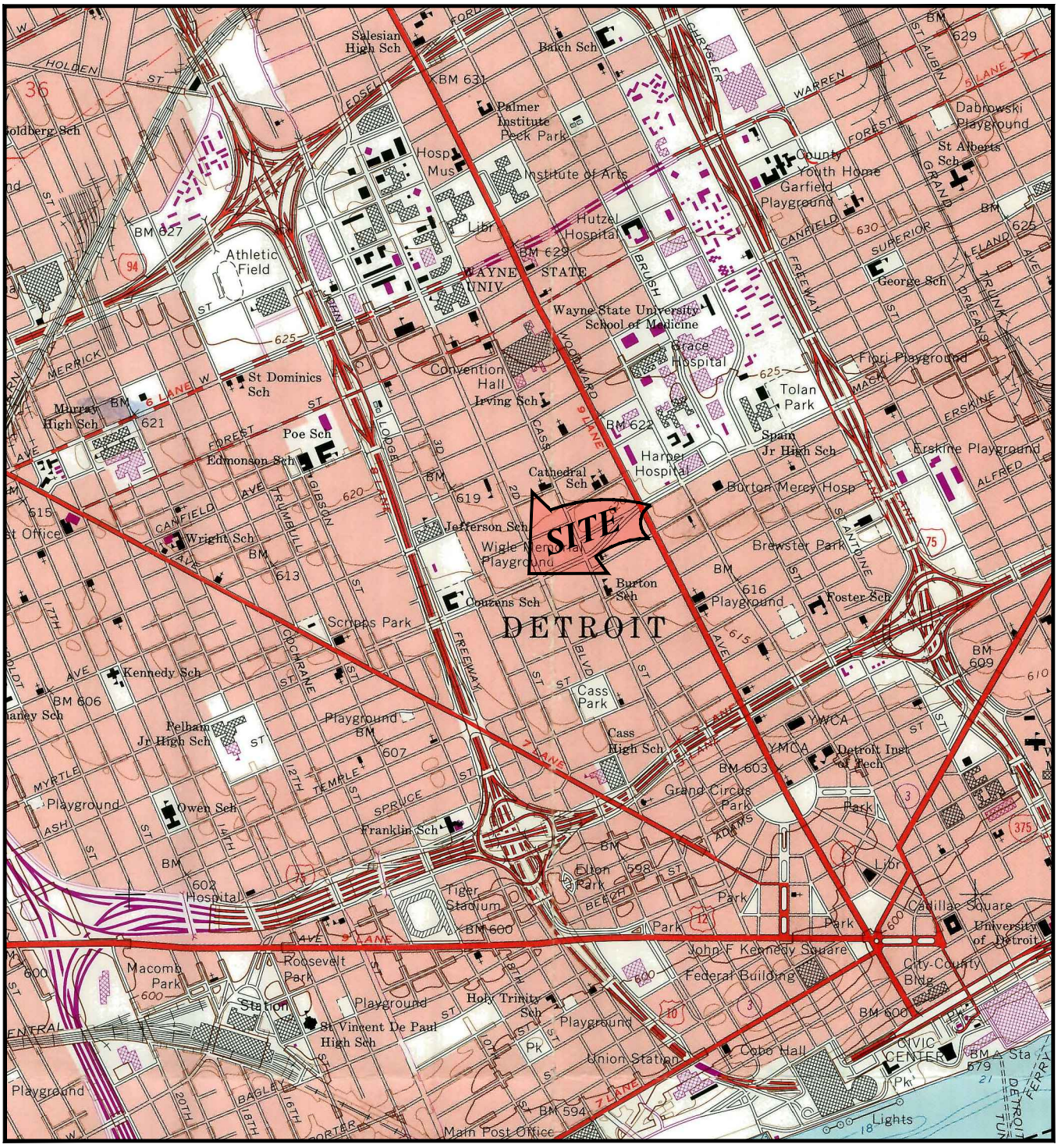

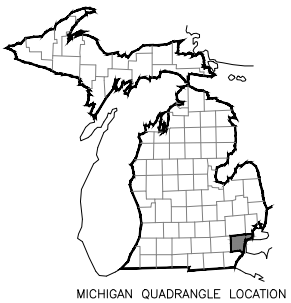

MICHIGAN QUADRANGLE LOCATION

WAYNE COUNTY

FIGURE 1

PROPERTY VICINITY MAP

UNITED STATES GEOLOGICAL SURVEY, 7.5 MINUTE SERIES

DETROIT, MI QUADRANGLE, 1968. PHOTO REVISED 1973 AND 1980.

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PROJ:

VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 2,000'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
DATE: 9/15/2020
CHKD BY: JB
SCALE: 1" = 2,000'
FILE NAME: 01-12411-0-001F00R00

651 BRAINARD STREET

ALLEY

2ND AVENUE

3522 2ND AVENUE

3514 2ND AVENUE

3500 2ND AVENUE

3470 2ND AVENUE

3469 2ND AVENUE

GPR LIMITATION:
AIR CONDITIONING UNITS

RESIDENTIAL

GRASS

GRAVEL/GRASS

GRAVEL/GRASS

GRAVEL/GRASS

Ⓐ

Ⓓ

Ⓓ

Ⓐ

Ⓖ

PARCEL ID:
04000689-90

FORMER GASOLINE USTs

630 MARTIN LUTHER KING JR.
BOULEVARD

631 MARTIN LUTHER KING JR.
BOULEVARD

SIDEWALK

MARTIN LUTHER KING
JR. BOULEVARD

LEGEND:

	SUBJECT PROPERTY
	APPROXIMATE FORMER/HISTORICAL SITE FEATURES
x	FENCE
Ⓐ	FORMER AUTOMOTIVE/BATTERY/ TIRE SHOP
Ⓓ	FORMER DWELLING
Ⓖ	FORMER GASOLINE FILLING STATION / DISPENSERS / USTs
UST	UNDERGROUND STORAGE TANK
	GPR SURVEY AREA

N

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FIGURE 2

SUBJECT PROPERTY AND ADJOINING PROPERTIES
WITH GPR SURVEY AREA

PROJ:

VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 30'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
CHKD BY: JB
DATE: 9/15/2020
SCALE: 1" = 30'
FILE NAME: 01-12411-0-001F00R00

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- FENCE
- GAS
- GAS
- PROPOSED SITE FEATURES
- UST — UNDERGROUND STORAGE TANK
- (A) — FORMER AUTOMOTIVE / BATTERY / TIRE SHOP
- (D) — FORMER DWELLING
- (G) — FORMER GASOLINE FILLING STATION / DISPENSERS / UST
- SOIL BORING
- SOIL GAS SAMPLE
- EXTENT OF PLUME
- ESTIMATED EXTENT OF PLUME
- LATERAL INCLUSION ZONE
- ESTIMATED LATERAL INCLUSION ZONE
- SSSVIAC PETROLEUM SOIL / SOIL GAS EXCEEDANCE LOCATION

N

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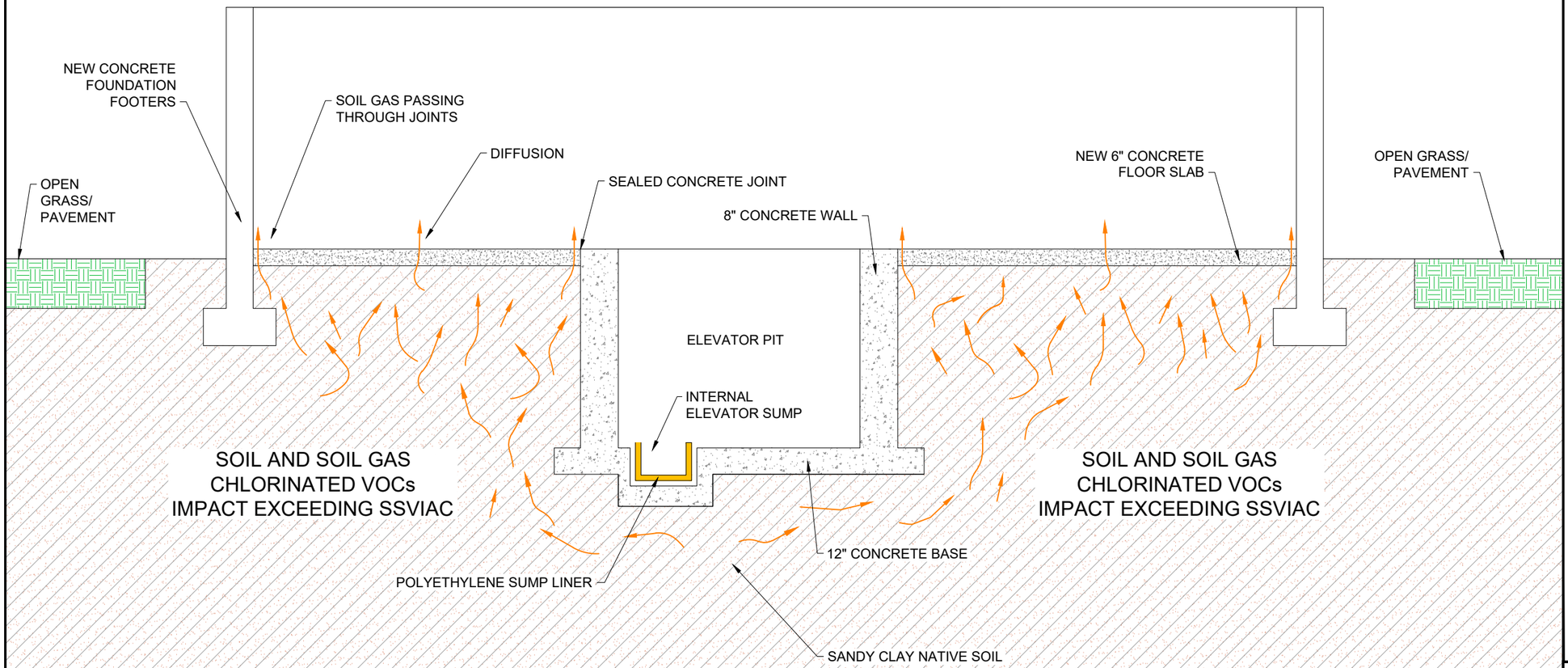
FIGURE 3

MAP SHOWING SITE LATERAL INCLUSION ZONE FOR VAPOR INTRUSION MITIGATION

PROJECT: FORMER INDUSTRIAL PROPERTY
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY	DRAWN BY: KS	DATE: 9/9/2021
VERIFY SCALE 0 — 40' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHECKED BY: KS	SCALE: 1" = 40'
	FILE NAME: 01-12411-2-002F00R00	

NEW CONSTRUCTION CSM



LEGEND:

CONCRETE

SAND

NOTE — VACUUM MONITORING POINTS ARE TO BE LOCATED NORTH, SOUTH, EAST, AND WEST OF EACH ELEVATOR PIT

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FIGURE 4

CONCEPTUAL SITE MODEL SHOWING PROPOSED MITIGATION OF THE NEW CONSTRUCTED BUILDING

PROJ:

VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

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Appendix A

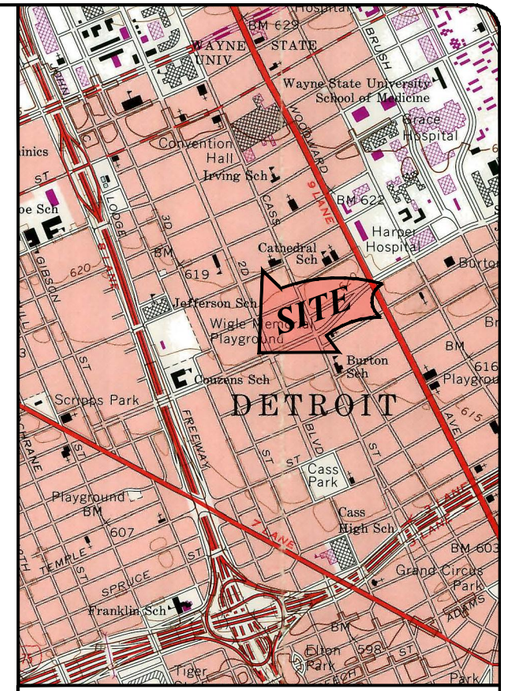
PM ENVIRONMENTAL Environmental & Engineering Services

VAPOR MITIGATION SYSTEM DESIGN AND SPECIFICATIONS PACKAGE

VACANT LAND
3515 SECOND AVENUE
DETROIT MI
PM PROJECT NUMBER 01-12411-2-0002

FEBRUARY 2022

REVISED AUGUST 2022



DRAWING NO.	TITLE
SHEET VIM-0:	COVER SHEET
SHEET VIM-1:	SPECIFICATIONS SHEET
SHEET VIM-2:	PROPOSED SSD SYSTEM
SHEET VIM-3:	FIRST FLOOR LAYOUT
SHEET VIM-4:	SECOND FLOOR LAYOUT
SHEET VIM-5:	ROOF PLAN
SHEET VIM-6:	CONSTRUCTION DETAILS
SHEET VIM-7:	SUB-SLAB VACUUM TEST PORT CONSTRUCTION DETAILS
SHEET VIM-8:	ELEVATOR PIT DETAIL
SHEET VIM-9:	STEGO DETAILS (10-15)
SHEET VIM-10:	STEGO DETAILS (16-21)

PRE-DEVELOPMENT
VACANT LAND

POST-DEVELOPMENT
RESIDENTIAL APARTMENTS

4 A3.1 North Side Elevation
Scale: 1/8" = 1'-0"

2 A3.1 East (2nd Ave.) Elevation
Scale: 1/8" = 1'-0"

PM ENVIRONMENTAL | Environmental & Engineering Services

SHEET VIM-0 COVER SHEET

VAPOR MITIGATION SYSTEM DESIGN AND SPECIFICATIONS PACKAGE

PROJ:

VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

	DESIGNED BY: JP	DRN BY: KS
DATE: 1/27/2022	FILE NAME: 01-12411-2-002F00R00	

1.0 CONTENTS

1.1 GENERAL

1. THE ENCLOSED DRAWINGS AND SPECIFICATIONS CONTAIN INFORMATION FOR THE INSTALLATION OF A VAPOR BARRIER AND SUB-SLAB DEPRESSURIZATION (SSD) SYSTEM. THE FOLLOWING DRAWINGS DEPICTING THE SYSTEM ARE REQUIRED FOR THE NEW CONSTRUCTION AND INSTALLATION:

DRAWING NO.	REVISION	TITLE
SHEET VIM-0:	0	COVER SHEET
SHEET VIM-1:	0	SPECIFICATIONS SHEET
SHEET VIM-2:	0	PROPOSED SSD SYSTEM
SHEET VIM-3:	0	FIRST FLOOR LAYOUT
SHEET VIM-4:	0	SECOND FLOOR LAYOUT
SHEET VIM-5:	0	ROOF PLAN
SHEET VIM-6:	0	CONSTRUCTION DETAILS
SHEET VIM-7:	0	SUB-SLAB VACUUM TEST PORT CONSTRUCTION DETAILS
SHEET VIM-8:	0	ELEVATOR PIT DETAIL
SHEET VIM-9:	0	STEGO DETAILS (10-25)
SHEET VIM-10	0	STEGO DETAILS (16-21)

THIS PACKAGE ALSO CONTAINS THE FOLLOWING SPECIFICATIONS REQUIRED FOR CONSTRUCTION AND INSTALLATION:

2.0 SPECIFICATIONS

2.1 GENERAL

1. THE SELECTED CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.
2. ALL MATERIALS USED FOR CONSTRUCTION OF THE SYSTEM SHALL BE NEW UNLESS OTHERWISE NOTED.
3. EQUIPMENT AND INSTRUMENTS WITHIN THE SYSTEM, UNLESS OTHERWISE SPECIFIED BY ENGINEERING PLANS, SHALL BE PROVIDED BY THE CONTRACTOR.
4. ALL NECESSARY CONSTRUCTION PERMITS AND INSPECTIONS SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR, INCLUDING PERMITS FOR ELECTRICAL, MECHANICAL, AND CIVIL CONSTRUCTION. ENGINEER SHALL OBTAIN AUTHORITY TO CONSTRUCT / PERMIT TO OPERATE THE VAPOR MITIGATION UNIT, FROM EGLE.
5. THE CONTRACTOR SHALL RESTORE ALL TRENCHED AREAS, IF NECESSARY, TO MATCH EXISTING CONDITIONS.
6. A PRE-CONSTRUCTION MEETING BETWEEN PM, THE CONTRACTOR, AND THE SITE CONSTRUCTION GENERAL CONTRACTOR WILL BE REQUIRED BEFORE ANY WORK BEGINS. THE MEETING WILL BE HELD AT THE SITE.
7. THE CONTRACTOR SHALL WARRANTY ALL MATERIALS AND CONSTRUCTION FOR A PERIOD OF ONE YEAR. ALL DEFECTS SHALL BE CORRECTED AT THE CONTRACTORS EXPENSE.
8. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL HEALTH AND SAFETY RULES AND REGULATIONS

2.2 VAPOR BARRIER

1. A MINIMUM 10 MIL VAPOR RETARDER OR EQUIVALENT SHALL BE INSTALLED BELOW THE GRAVEL BED. THE VAPOR RETARDER UNDER THE GRAVEL BED SHALL NOT BE SEALED OR HAVE OVERLAPPING EDGES TO ALLOW WATER DRAINAGE, IT SHOULD TERMINATE AT FOUNDATION WALLS OR ADJACENT SLABS.
2. A MINIMUM 15 MIL VAPOR BARRIER OR EQUIVALENT SHALL BE INSTALLED ABOVE THE GRAVEL BED. THIS VAPOR BARRIER INSTALLED ON TOP OF THE GRAVEL BED PRIOR TO THE INSTALLATION OF THE SLAB SHALL BE OVERLAPPED AT LEAST 12 INCHES AND HAVE THE TOP OVERLAP TAPED TO THE UNDERSIDE LAYER USING FOUR INCH WIDE TAPE DESIGNATED FOR THIS APPLICATION. THE TAPE SHALL BE CENTERED OVER THE TOP LAYER EDGE. THE BARRIER ON TOP OF THE GRAVEL BED SHALL BE INSTALLED SO THAT IT IS ABUTS THE PERIMETER FOUNDATION WALL. ANY PENETRATIONS OF THE UPPER LAYER MEMBRANE SHALL BE SEALED AIR TIGHT USING THE MEMBRANE TAPE.
3. INSTALLER SHALL FOLLOW MANUFACTURER INSTALLATION SPECIFICATIONS AND SHALL BE TRAINED AND EXPERIENCED AND/OR CERTIFIED IN THE INSTALLATION OF THE SPECIFIED PRODUCT.
4. VAPOR BARRIER TERMINATIONS ON HORIZONTAL AND VERTICAL SURFACES SHOULD EXTEND AT LEAST 6" ONTO THE TERMINATION SURFACE.
5. TO PROPERLY SEAL AROUND PENETRATIONS, INCLUDING BUT NOT LIMITED TO SSD PIPING, SAMPLE PORTS, VACUUM TEST LINES AND UTILITIES, CUT A PIECE OF THE VB MATERIAL THAT WILL EXTEND 6" BEYOND THE OUTSIDE PERIMETER OF THE PENETRATIONS. CUT A HOLE IN THE MATERIAL JUST BIG ENOUGH TO SLIDE OVER THE PENETRATION, ENSURING THE MATERIAL FITS SNUG AGAINST THE PENETRATION, THIS CAN BE DONE BY CUTTING AN "X" NO LARGER THAN THE INSIDE DIAMETER OF THE PENETRATION. THERE SHOULD NOT BE A GAP LARGER THAN 1/8" BETWEEN THE MATERIAL AND HE PENETRATION. FINISHED USING STEGO TAPE OR METHODS RECOMMENDED BY THE MANUFACTURER FOR SEALING PENETRATIONS AND TERMINATIONS.

2.3 GRAVEL ZONE INSTALLATION

1. IN ORDER FOR THE SYSTEM TO FUNCTION EFFICIENTLY A CONTINUOUS LAYER OF ¾INCH AASHTO GRADED #57 STONE WITH A MINIMUM DEPTH OF 6 INCHES SHALL BE INSTALLED BELOW ALL BUILDING SLABS IN CONTACT WITH THE GROUND. (AASHTO #57 COARSE AGGREGATE STONE HAS 100% PASSING 1 1/2" SCREEN, 95-100% PASSING 1" SCREEN, 25-60% PASSING 1/2" SCREEN, 0-10% PASSING #4 SCREEN, AND 0-5% PASSING #8 SCREEN).
2. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO UNDERGROUND UTILITIES, PIPING AND ADJOINING STRUCTURES.

2.4 SSD VENTILATION PIPING

1. THE PIPING INSTALLED BELOW THE SLAB SHALL BE A 4"DIAMETER SOLID PVC (POLYVINYL CHLORIDE) CONFORMING TO ASTM D-2729 (SEWER & DRAIN). THE PIPING INSTALLED ABOVE THE SLAB SHALL BE 4" DIAMETER SCHEDULE 40 PVC (POLYVINYL CHLORIDE) CONFORMING TO ASTM D-1785. THE DRAWINGS PROVIDED SHOW THE LOCATIONS OF THE SUB SLAB PIPING AND VERTICAL RISER LOCATIONS.
2. ALL SUB SLAB PIPING INSTALLED SHALL BE SOLIDLY BEDDED BELOW THE SLAB WITH A MINIMUM OF 1"OF STONE BASE UNDER THE PIPING AND A MINIMUM OF 1"OF STONE BASE ON TOP OF THE PIPING. SUB SLAB PIPING SHALL HAVE FULL BEARING FOR EACH PIPE SECTION THROUGHOUT ITS LENGTH, INSTALLED DEAD LEVEL, STRAIGHT, AND IN TRUE ALIGNMENT. FOR SOLID SUB SLAB PIPING, A ½"DIAMETER HOLE SHOULD BE DRILLED IN THE BOTTOM OF THE PIPE EVERY 10 FEET TO ALLOW FOR CONDENSATE DRAINAGE. PROVIDE PVC COUPLINGS AND FITTINGS AS REQUIRED.
3. SUB SLAB PIPING ROUTED ACROSS UNSUPPORTED AREAS PRIOR TO INSTALLATION OF THICKENED SLABS OR FOUNDATION WALLS SHALL BE PLACED INSIDE LARGER DIAMETER SCHEDULE 40 PVC PIPING SLEEVES THAT HAS MINIMUM OF 12"BEARING ON EITHER END.
4. CONTRACTOR SHALL DETERMINE EXACT RISER POSITION OF SOIL VENTING PIPE RISER INSTALLED IN THE GRAVEL SO THAT IT ALIGNS WITH APPROPRIATE RISER LOCATION UP THROUGH THE BUILDING. ALL VERTICAL RISERS SHALL BE 4- INCH SCHEDULE 40 PVC. HORIZONTAL PIPE RUNS ARE PERMITTED WITHIN THE BUILDING OR THE ATTIC AS REQUIRED BUT ALL PIPES MUST BE PITCHED BACK TO THE SLAB PENETRATION WITH AT LEAST A ONE INCH PITCH FOR EVERY 10 FEET OF PIPING. SOIL VENT STACK PIPING SHALL BE ANCHORED TO BUILDING STRUCTURE AT FLOOR INTERSECTIONS AND AT INTERMEDIATE LOCATIONS NO GREATER THAN EVERY 8 FEET OF VERTICAL RISE AND NO GREATER THAN EVERY 6 FEET OF HORIZONTAL RUN TO PREVENT MOVEMENT OR RATTLING OF PIPING NETWORK. SUPPORTS AND ANCHORS SHALL BE CLAMPS AND BRACKETS COMPATIBLE WITH PIPING MATERIALS.

2.5 ROOF PENETRATIONS

1. ROOF PENETRATIONS SHOULD BE PERFORMED AND SEALED ACCORDING TO THE ROOFING MATERIAL SPECIFICATIONS. THE SOIL VENT PIPE SHOULD TERMINATE NO LESS THAN 18 INCHES ABOVE THE ROOFLINE AND NO LESS THAN 6 FEET FROM THE OUTER EDGE OF THE ROOF AND 20 FEET FROM ANY DOOR, WINDOW, HVAC INTAKE, OR OTHER DIRECT OPENING INTO THE BUILDING WHERE POSSIBLE.

2.6 CONCRETE SEALING

1. IF THE GROUND CONTACT CONCRETE SLAB ABUTS AGAINST A FOUNDATION WALL OR OTHER SURFACE THAT PRODUCES A COLD JOINT, A PEEL OFF EXPANSION JOINT MATERIAL SHALL BE INSTALLED CONTINUOUSLY AROUND THE OUTER EDGE OF THE SLAB. THE PEEL OFF EXPANSION STRIP SHALL BE INSTALLED SO THAT THE TOP OF THE STRIP IS FLUSH WITH THE CONCRETE SLAB, THE STRIP SHOULD BE INSTALLED USING ADHESIVE OR MECHANICAL FASTENERS. THE PEEL OFF STRIP SHALL BE BETWEEN 3/8" AND 3/4"IN WIDTH.
2. ALL PEEL OFF EXPANSION JOINT MATERIAL SHALL HAVE THE UPPER PEEL OFF SECTION REMOVED AND THE VOID SPACE FILLED WITH NON-CRACKING POLYURETHANE CAULK COMPLYING WITH ASTM C920 CLASS 25 OR HIGHER, OR EQUIVALENT.
3. ALL VISIBLE CRACKS AND CONTROL JOINTS IN INTERIOR CONCRETE SLABS THAT ARE GREATER THAN 1/16" IN WIDTHSHALL BE SEALED UTILIZING A NON-CRACKING POLYURETHANE CAULK COMPLYING WITH ASTM C920 CLASS 25 OR HIGHER, OR EQUIVALENT. JOINTS, CRACKS AND SAW CUTS SHALL BE SWEPT OR VACUUMED CLEAN BEFORE APPLICATION OF ANY SEALANT. USE CAULKING MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION OF CAULKING FOR CONCRETE SLAB FLOORS.
4. ANY PERIMETER OR INTERIOR JOINTS TO BE SEALED SHALL HAVE ANY CONCRETE RIDGES PROTRUDING ABOVE THE SLAB HEIGHT REMOVED PRIOR TO SEALING. THE SPECIFIED CONCRETE SLAB SEALING SHALL BE DONE AT LEAST 30 DAYS AFTER CONCRETE SLAB HAS BEEN INSTALLED. OTHER LARGER OPENINGS THROUGH THE SLAB THAT ARE OPEN TO THE SUB SLAB OR SOIL SUCH AS PLUMBING PENETRATIONS, SUMP PITS OR PLUMBING BLOCK OUTS SHALL BE SEALED WITH DURABLE MATERIAL SO AS TO BE AIR TIGHT.
5. SUMP PITS OPEN TO SUB SLAB SOIL SHALL HAVE AIR TIGHT LIDS. OPENINGS IN OR AROUND SUMP COVERS SHALL BE SEALED WITH A GASKET OR USE OF SILICONE CAULKING FOR EASY REMOVAL FOR SUMP PIT FOR MAINTENANCE. SUMP PITS THAT HAVE A SUMP PUMP SHALL HAVE AN ACCESS PORT IN THE SUMP PIT COVER TO ALLOW CHECKING OF THE SUMP PUMP WITHOUT NEEDING TO REMOVE THE COVER.

2.7 ELECTRIC

1. MITIGATION FANS WILL REQUIRE A DEDICATED 240V BREAKER. A LICENSED ELECTRICIAN SHOULD PERFORM ALL SPECIFIED ELECTRICAL WORK. MITIGATION FANS MAY SHARE A BREAKER WITH ONE ANOTHER. BREAKERS FOR MITIGATION FANS SHOULD BE LABELED "VOC DO NOT TURN OFF". THE SYSTEM ALARM AND OTHER SSDS RELATED MONITORING EQUIPMENT SHOULD BE INSTALLED ON A SEPARATE CIRCUIT FROM THE MITIGATION FANS.

2.8 FAN SPECIFICATIONS

1. THE MITIGATION FANS TO BE INSTALLED ARE GBR89 OR EQUIVALENT FANS. THE FAN'S EXHAUST MUST BE AT LEAST 20 FEET FROM ANY DOOR, WINDOW, HVAC INTAKE, OR OTHER DIRECT OPENING INTO THE BUILDING WHERE POSSIBLE. THE FAN SPECIFIED FOR THE SSDS IS NOT ANTICIPATED TO CAUSE ANY BACK-DRAFTING OF THE BUILDINGS UTILITIES.

2.9 MONITORING AND ALARMS

1. ACTIVE MITIGATION SYSTEMS REQUIRE A VISUAL VACUUM MONITOR. AT A MINIMUM, A GAUGE CAPABLE OF PROVIDING THE APPLIED VACUUM SHOULD BE INSTALLED (GBR 25T OR EQUIVALENT GAUGE). GBR 25T GAUGES WILL NEED TO BE INSTALLED ON A NON-SWITCH DEDICATED CIRCUIT AND IS DESIGNED TO RESET ITSELF IN THE EVENT OF A POWER FAILURE. EACH VISUAL VACUUM MONITOR WILL BE PAIRED WITH A TELEMETRY SYSTEM TO PROVIDE REMOTE MONITORING (GBR 25T PAIRED WITH AN EDG 0-10 WIRELESS SENSOR SENDER THAT WILL TRANSMIT TO A 4G LTE EDG GATEWAY OR EQUIVALENT). CUT SHEETS FOR REMOTE MONITORING ARE ATTACHED. SUB SLAB TEST PORTS WILL BE INSTALLED WITHIN THE SYSTEM'S RADIUS OF INFLUENCE TO CONFIRM SUB SLAB VACUUM. SUGGESTED TEST PORT LOCATIONS ARE SHOWN ON DRAWING SHEET SSD-0 AND SSD-1. GBR SUB SLAB TEST PORTS WILL BE INSTALLED BY DRILLING A 20 MM HOLE AND HAMMERING IN THE PORTS. THE GBR SUB SLAB FLOOR PORT CUT SHEET IS ATTACHED. FOR MONITORING PORTS 3, 4, 5, 7, 8, AND 9, 1/4 PNEUMATIC TUBING SHALL RUN FROM THE PROPOSED MONITORING PORT LOCATIONS SUB SLAB TO THE NEAREST UTILITY ROOM OR MECHANICAL AREA TO AVOID POTENTIAL ISSUES WITH RESTRICTED ACCESS. THE TUBING SHOULD TERMINATE IN A WALL MOUNTED ENCLOSURE. SUB SLAB SAMPLING PORTS SHALL BE INSTALLED AT THE ENDS OF THE TUBING AT EACH MONITORING PORT LOCATION WITH THIS RESTRICTION. SEE DETAILS SECTION.

2.10 EQUIPMENT

1. EQUIPMENT AND INSTRUMENTS WITHIN THE SYSTEM, UNLESS OTHERWISE SPECIFIED BY ENGINEERING PLANS, SHALL BE PROVIDED BY THE CONTRACTOR.

2.11 CONSTRUCTION

1. THE CONTRACTOR SHALL CONFIRM A CONSTRUCTION SCHEDULE WITH THE ENGINEER'S PROJECT MANAGER AT LEAST 7-DAYS PRIOR TO ANY WORK AT THE SITE.
2. THE PROPOSED CONSTRUCTION SCHEDULE SHALL BE PRESENTED IN A TIME LINE FORMAT SHOWING ESTIMATED START DATE, DURATION AND COMPLETION TIMES FOR EACH ACTIVITY. ANY DEVIATION FROM THE ORIGINALLY PROPOSED SCHEDULE MUST BE COMMUNICATED TO THE ENGINEER'S PROJECT MANAGER WITHIN 24-HOURS.

2.12 AS-BUILT DRAWINGS

1. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORD DRAWINGS (RED LINES) SHOWING ACTUAL DETAILS, DIMENSIONS AND OTHER PERTINENT FEATURES THAT VARY FROM THE ORIGINAL DESIGN.

3.0 SAFETY / CLEANUP

1. ALL SITE WORKERS SHALL HAVE THE APPROPRIATE HEALTH AND SAFETY TRAINING AND CERTIFICATION AS REQUIRED BY FEDERAL LAW, STATE LAW, AND THE PROPERTY OWNER.
2. THE CONTRACTOR (INCLUDING WORKERS AND SUBCONTRACTORS) SHALL PREPARE A SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP) PRIOR TO BEGINNING ANY WORK, AND SHALL ABIDE BY THE HASP DURING ALL SITE WORK. A COPY OF THE HASP SHALL BE PROVIDED TO THE ENGINEER PRIOR TO BEGINNING ANY SITE WORK.
3. PRIOR TO DEPARTURE FROM THE SITE EACH DAY AND AT PROJECT COMPLETION, THE CONTRACTOR SHALL MAKE SURE THAT THE WORK AREA IS CLEAN AND ORDERLY.
4. THE CONTRACTOR SHALL CONTAIN LOOSE DEBRIS AND STORE CONSTRUCTION MATERIALS ON A DAILY BASIS PRIOR TO DEPARTURE FROM THE SITE TO PROVIDE A CLEAN AND ORDERLY WORK AREA. 5. CONTRACTOR SHALL MARK ALL POTENTIAL OVERHEAD AND/OR TRIP HAZARDS IN YELLOW.

4.0 INSPECTIONS

1. ALL SITE INSPECTIONS REQUIRE A MINIMUM 24 HOURS NOTICE.

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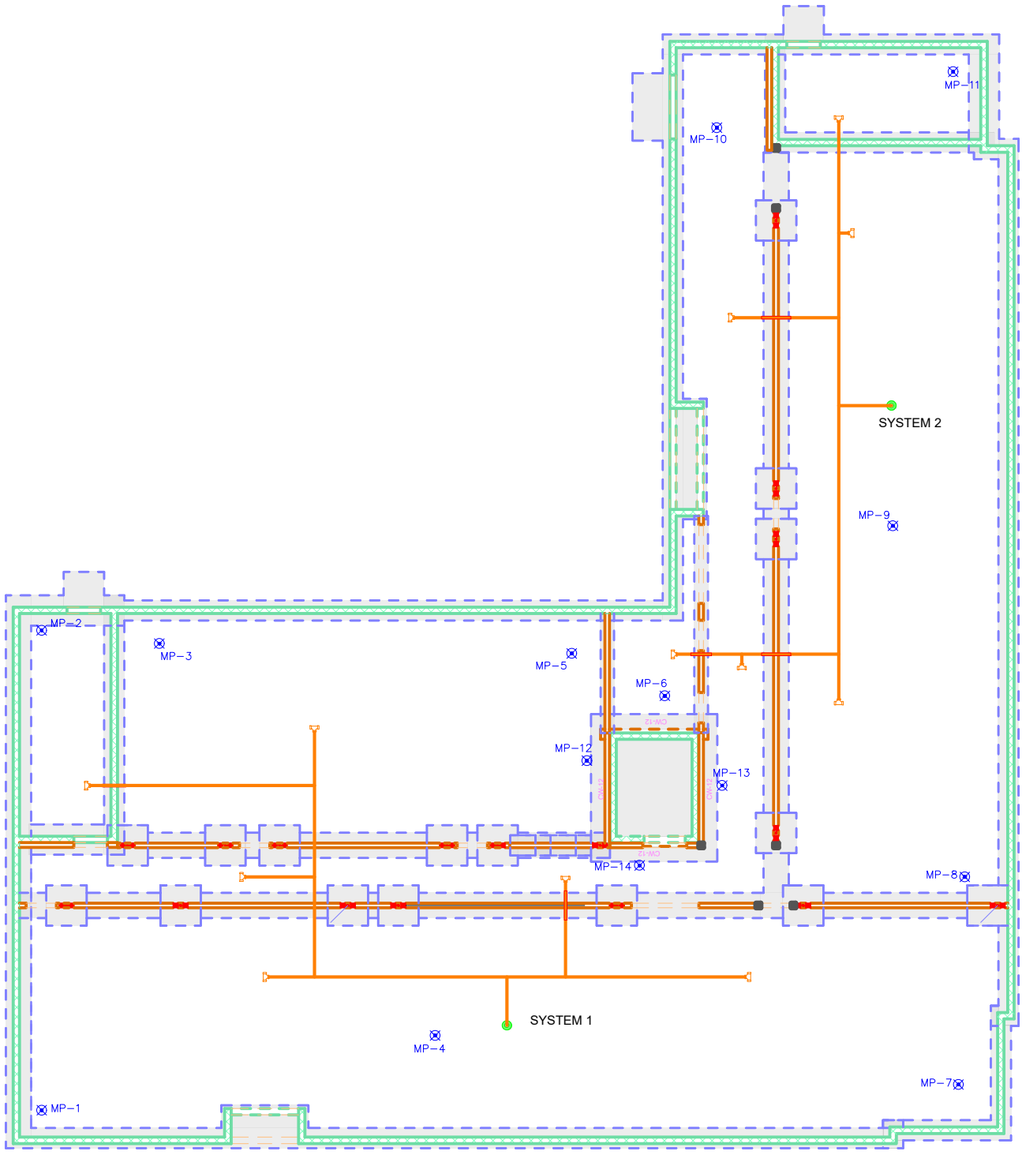
SHEET VIM-1
SPECIFICATIONS SHEET

PROJ:
VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 NTS
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
CHKD BY: JP
DATE: 1/27/2022
SCALE: NTS
FILE NAME: 01-12411-2-002F00R00



NOTE

4" SUCTION TEES NOT TO EXCEED 6,200 SQUARE FEET OF COVERAGE PER ANSI/AARST CC-1000 SOIL GAS CONTROL SYSTEMS IN NEW CONSTRUCTION OF BUILDINGS

LEGEND:

- 4" DIA SSD SYSTEM PIPING
- FOUNDATION SLEEVE
- 4" DIA SSD RISER
- MONITORING TEST POINT
- TEE FITTING

PM ENVIRONMENTAL | Environmental & Engineering Services

SHEET VIM-2

PROPOSED SSD SYSTEM

PROJ:

VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

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	FILE NAME: 01-12411-2-002F00R00	

LEGEND:

- 4" DIA SSD RISER
- MONITORING TEST POINT

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SHEET VIM-3

FIRST FLOOR LAYOUT

PROJ:

VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

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VERIFY SCALE 0 — 15' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHKD BY: JP	SCALE: 1" = 15'
	FILE NAME: 01-12411-2-002F00R00	

LEGEND:

4" DIA SSD RISER

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SHEET VIM-4

SECOND FLOOR LAYOUT

PROJ:

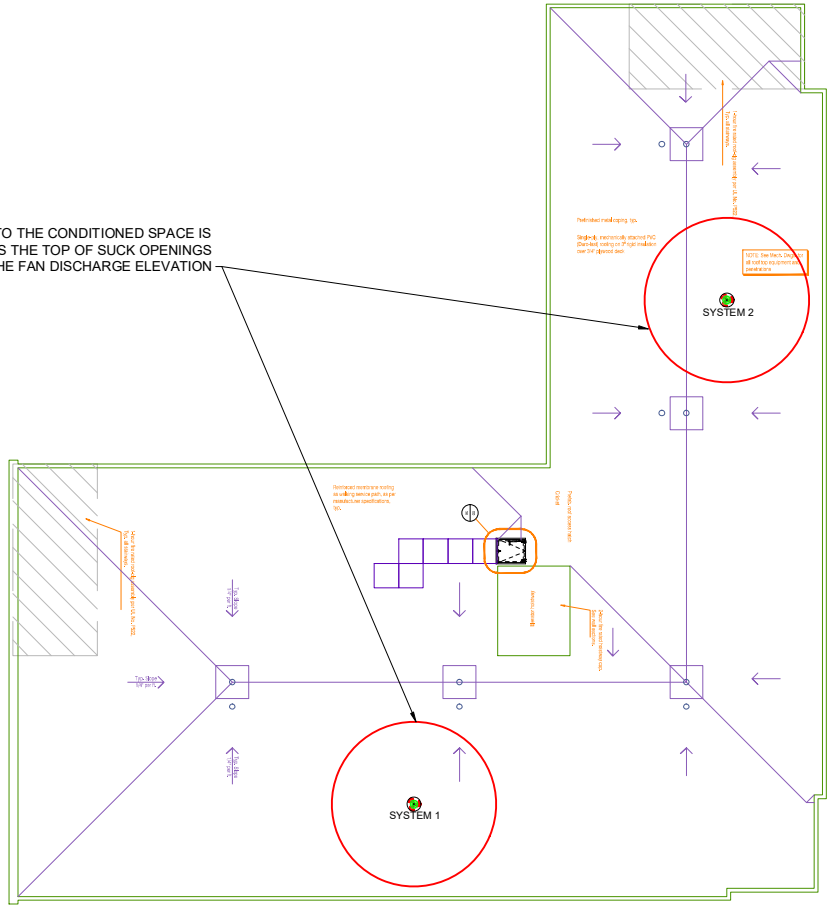
VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 15'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
CHKD BY: JP
DATE: 1/27/2022
SCALE: 1" = 15'
FILE NAME: 01-12411-2-002F00R00

NO OPENING, VENT, OR AIR INTAKE INTO THE CONDITIONED SPACE IS ALLOWED WITHIN THIS ZONE UNLESS THE TOP OF SUCK OPENINGS ARE AT LEAST 3' BELOW THE FAN DISCHARGE ELEVATION



LEGEND:

	4" SSD RISER
	SSD FAN
NOTE	IF THE HORIZONTAL SETBACK DISTANCE OF 20' FROM THE FAN CANNOT BE MAINTAINED, THE FAN HEIGHT CAN BE REVISED FROM 48" UP TO 66" FROM THE ROOF LEVEL TO ACCOMMODATE FOR THE 3' VERTICAL SETBACK

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SHEET VIM-5

ROOF PLAN

PROJ:

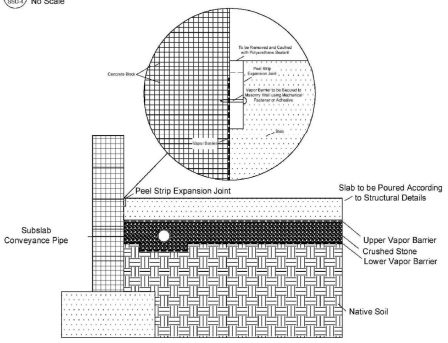
VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

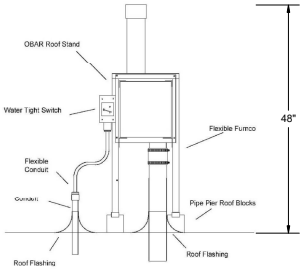
VERIFY SCALE
0 15'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
CHKD BY: JP
DATE: 1/27/2022
SCALE: 1" = 15'
FILE NAME: 01-12411-2-002F00R00

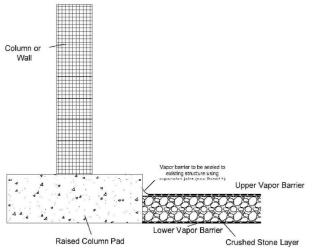
1 SSD-4 Vapor Barrier and Expansion Joint Detail
No Scale



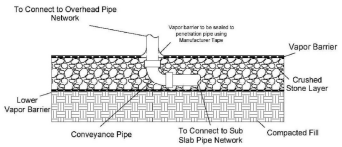
2 SSD-4 Fan on Roof Detail
No Scale



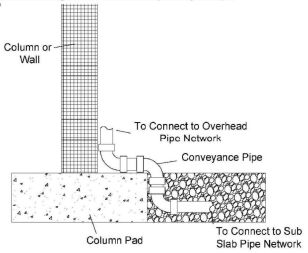
3 SSD-4 Typical Structure Sealing Detail
No Scale



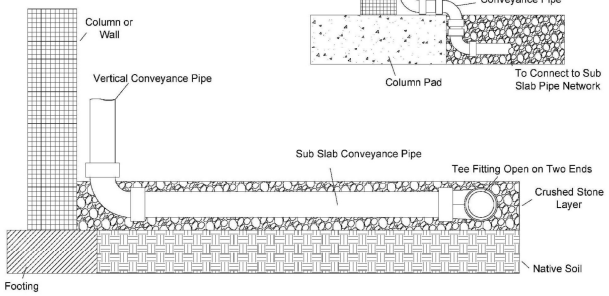
5 SSD-4 Typical Penetration Sealing Detail
No Scale



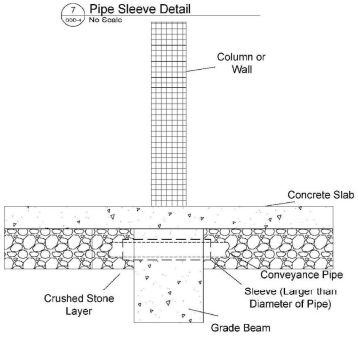
4 SSD-4 Piping Off Footing or Column Pad (If Required)
No Scale



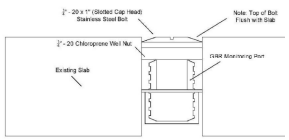
6 SSD-4 Typical Sub Slab Section View
No Scale

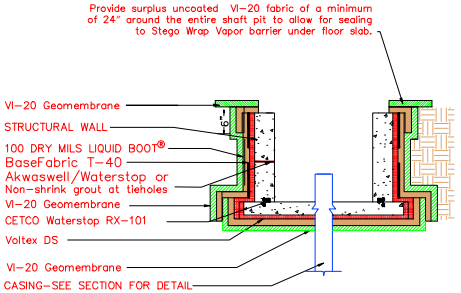


7 SSD-4 Pipe Sleeve Detail
No Scale



8 SSD-4 Monitoring Test Port Detail
No Scale





TYPICAL DETAIL AT ELEVATOR PIT
NOT TO SCALE
9

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SHEET VIM-6

CONSTRUCTION DETAILS

PROJ:
VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 NTS
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

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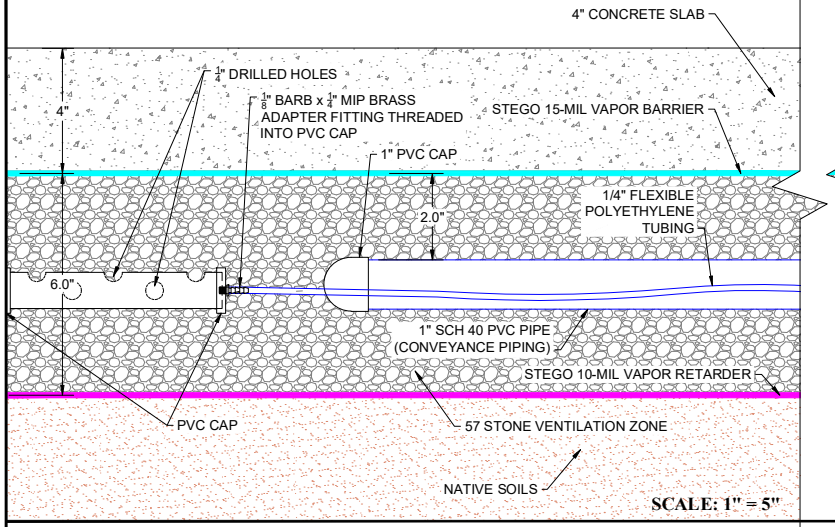
CHKD BY: JP
DATE: 1/27/2022
SCALE: NTS
FILE NAME: 01-12411-2-002F00R00

22 - SIDE
VACUUM PORT, IN-SITU COMPONENTS



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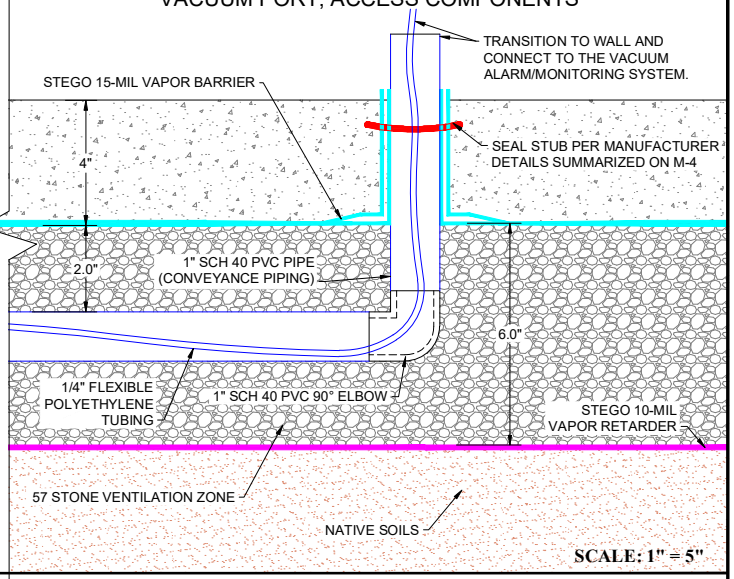
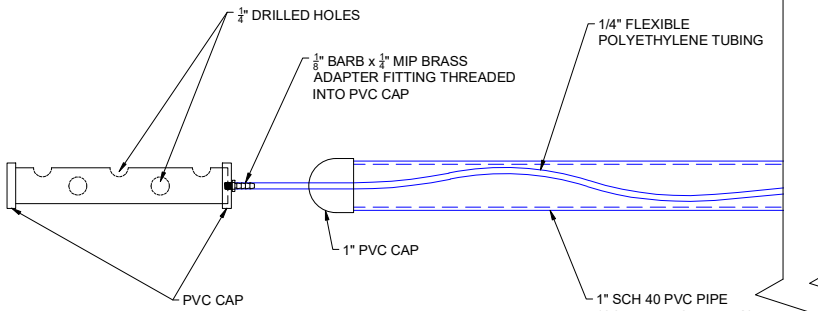
22 - SIDE
VACUUM PORT, ACCESS COMPONENTS



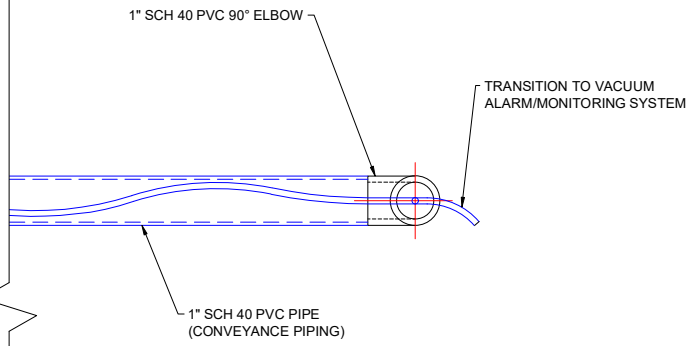
SCALE: 1" = 5"

22 - TOP
VACUUM PORT, IN-SITU COMPONENTS



SCALE: 1" = 5"

22 - TOP
VACUUM PORT, ACCESS COMPONENTS



SCALE: 1" = 5"

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SHEET VIM-7

SUB-SLAB VACUUM TEST PORT CONSTRUCTION DETAILS

PROJ:

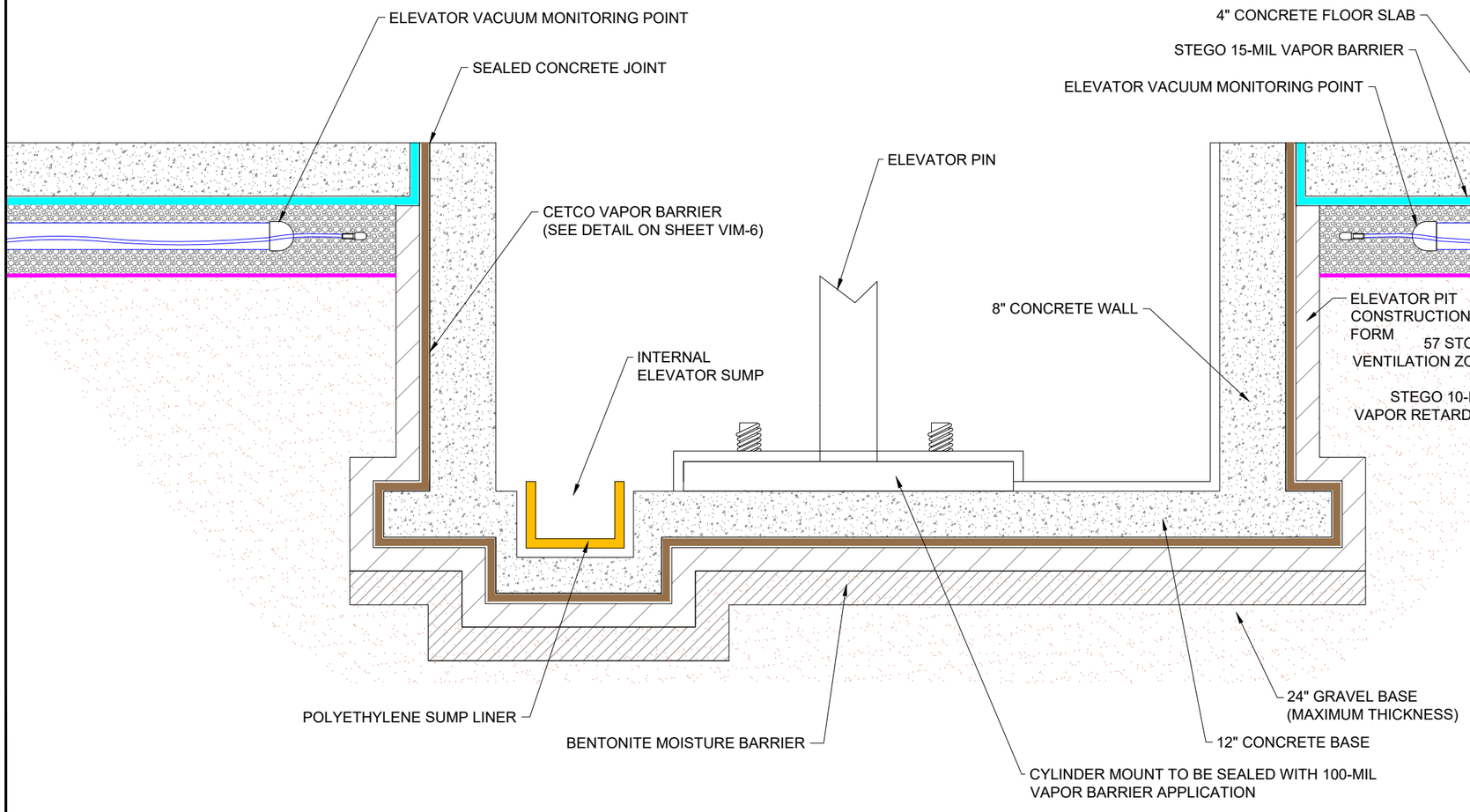
VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 5"
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS
CHKD BY: JP
DATE: 1/27/2022
SCALE: 1" = 5"
FILE NAME: 01-12411-2-002F00R00

ELEVATOR PIT VAPOR BARRIER DETAIL



LEGEND:

CONCRETE

SAND

NOTE — VACUUM MONITORING POINTS ARE TO BE LOCATED NORTH, SOUTH, EAST, AND WEST OF EACH ELEVATOR PIT

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SHEET VIM-8

ELEVATOR PIT DETAIL

PROJ:

VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: KS	DATE: 1/27/2022
VERIFY SCALE 0 [redacted] NTS IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHKD BY: JP	SCALE: NTS
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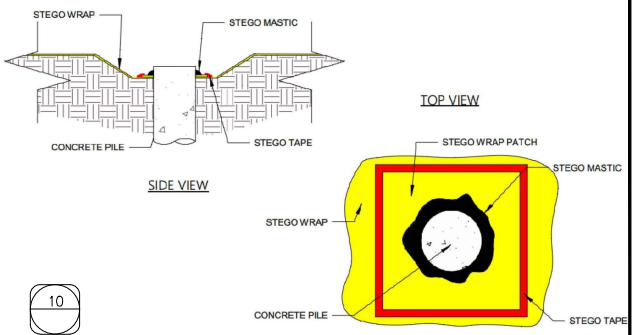
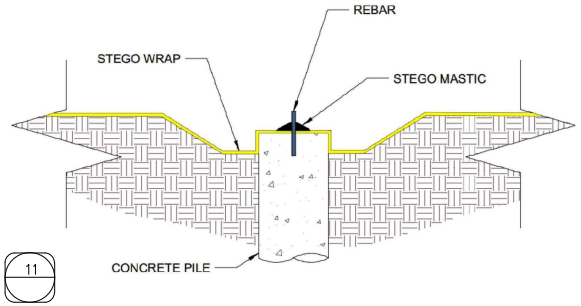


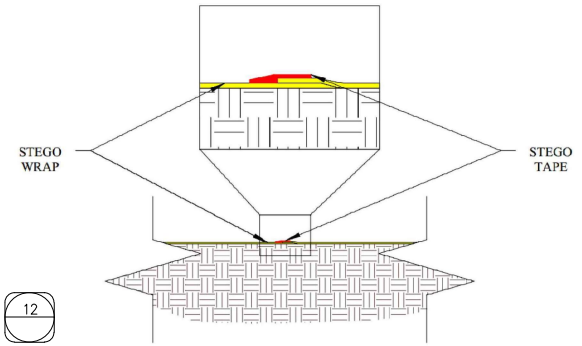
10

STEGO® WRAP		
SEALED TO PILE WITH STEGO® TAPE AND STEGO® MASTIC		
CONCEPTUAL FIELD ILLUSTRATION		
PAGE 1 OF 1	NOT TO SCALE	6 AUGUST 2020



11

STEGO® WRAP		
OVER PILE, SEALED AT IMPEDIMENT WITH STEGO® MASTIC		
CONCEPTUAL FIELD ILLUSTRATION		
PAGE 1 OF 1	NOT TO SCALE	6 AUGUST 2020



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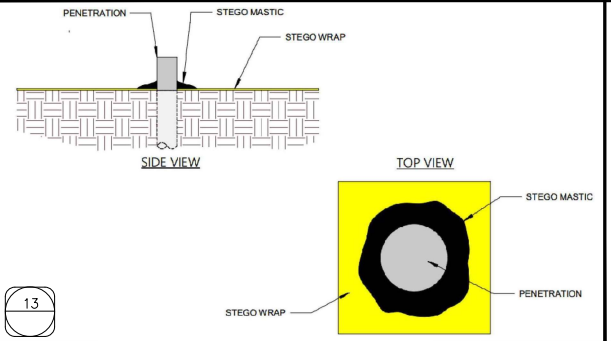
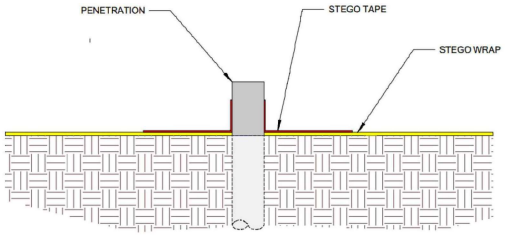
STEGO® WRAP		
OVERLAP WITH STEGO® TAPE		
CONCEPTUAL FIELD ILLUSTRATION		
PAGE 1 OF 2	NOT TO SCALE	6 AUGUST 2020



13

STEGO® WRAP		
PENETRATION SEALED WITH STEGO® MASTIC		
CONCEPTUAL FIELD ILLUSTRATION		
PAGE 1 OF 1	NOT TO SCALE	7 AUGUST 2020



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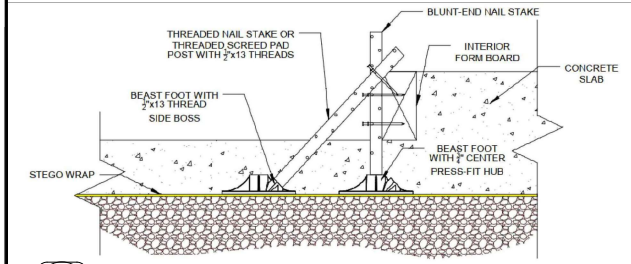
PENETRATION SEALED WITH STEGO® TAPE		
CONCEPTUAL FIELD ILLUSTRATION		
PAGE 1 OF 1	NOT TO SCALE	6 AUGUST 2020



15

STEGO® WRAP		
VAPOR BARRIER-SAFE INTERIOR FORMING WITH BEAST® FOOT		
CONCEPTUAL FIELD ILLUSTRATION		
PAGE 1 OF 1	NOT TO SCALE	28 AUGUST 2017

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SHEET VIM-9

STEGO DETAILS (10-15)

PROJ:

VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

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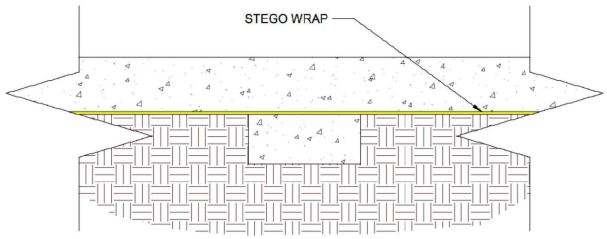
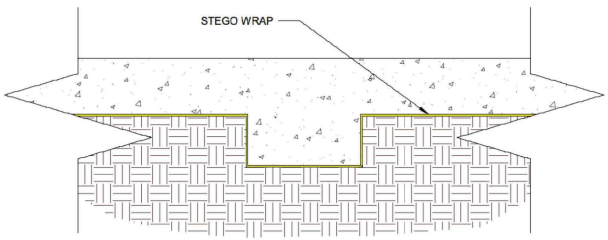


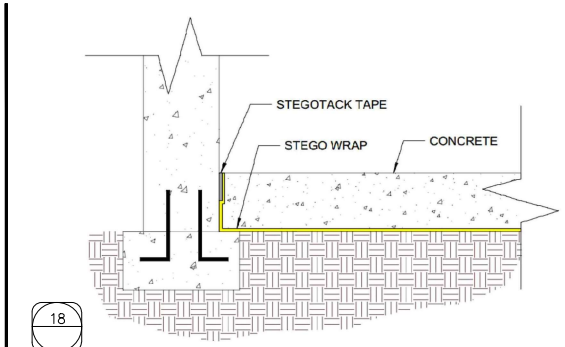
16

STEGO® WRAP	
OVER TWO-POUR GRADE BEAM (NO IMPEDIMENT)	
CONCEPTUAL FIELD ILLUSTRATION	
PAGE 1 OF 1	NOT TO SCALE | 8 AUGUST 2020



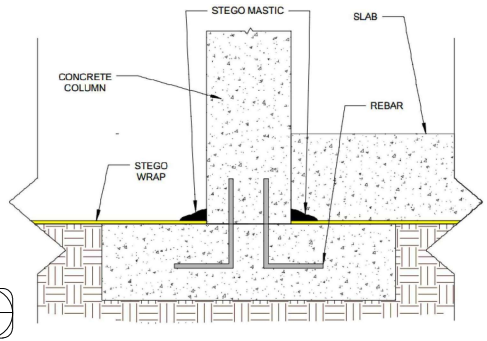
17

STEGO® WRAP	
ENCAPSULATING MONOLITHICALLY-POURED INTERIOR GRADE BEAM	
CONCEPTUAL FIELD ILLUSTRATION	
PAGE 1 OF 1	NOT TO SCALE | 6 AUGUST 2020



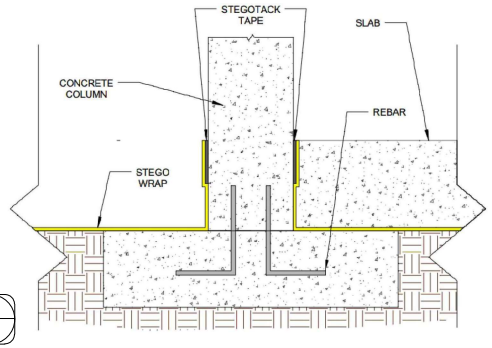
18

STEGO® WRAP	
PERIMETER WALL SEAL TO WALL AT SLAB ELEVATION WITH STEGOTACK® TAPE	
CONCEPTUAL FIELD ILLUSTRATION	
PAGE 1 OF 1	NOT TO SCALE | 6 AUGUST 2020



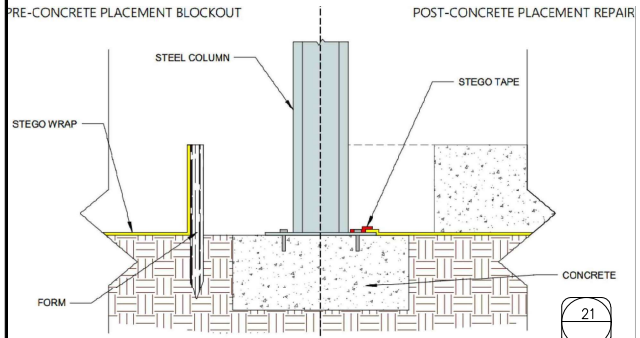
19

STEGO® WRAP	
CONCRETE COLUMN, SEALED TO COLUMN WITH STEGO® MASTIC	
CONCEPTUAL FIELD ILLUSTRATION	
PAGE 1 OF 1	NOT TO SCALE | 8 AUGUST 2020



20

STEGO® WRAP	
CONCRETE COLUMN, SEALED TO COLUMN WITH STEGOTACK® TAPE	
CONCEPTUAL FIELD ILLUSTRATION	
PAGE 1 OF 1	NOT TO SCALE | 6 AUGUST 2020



21

STEGO® WRAP	
COLUMN BLOCKOUT EXAMPLE, SEALED TO COLUMN WITH STEGO® TAPE	
CONCEPTUAL FIELD ILLUSTRATION	
PAGE 1 OF 1	NOT TO SCALE | 6 AUGUST 2020

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SHEET VIM-10

STEGO DETAILS (16-21)

PROJ:

VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

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		FILE NAME: 01-12411-2-002F00R00	

Appendix B

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Fan (Area Number-Fan Number)	Fan Type	Projected Airflow (cfm)	Projected ROI (ft)	Vacuum Needed at Suction Pit (in)	Piping Headloss (in of water)	Fittings Headloss (in of water)	Total Headloss (in of water)	Vacuum Projected at Fan (in)	Fan Max Vacuum (in)	Fan Max Airflow (cfm)
SYSTEM 1	GBR 89	60	74	1	0.0397	0.5139	0.5536	1.5536	14	500
SYSTEM 2	GBR 89	60	74	1	0.0246	0.2165	0.2411	1.2411	14	500

Head loss caluclations were done by using Darcy-Weisbach method

Projected airflow, ROI, and vacuum were determined using pilot test data

*Projected vacuum-ROI-airflow were determined using a spreadsheet model for airflow

VACUUM-AIRFLOW-ROI RELATIONSHIPS FOR SYSTEMS WITH SUCTION PITS

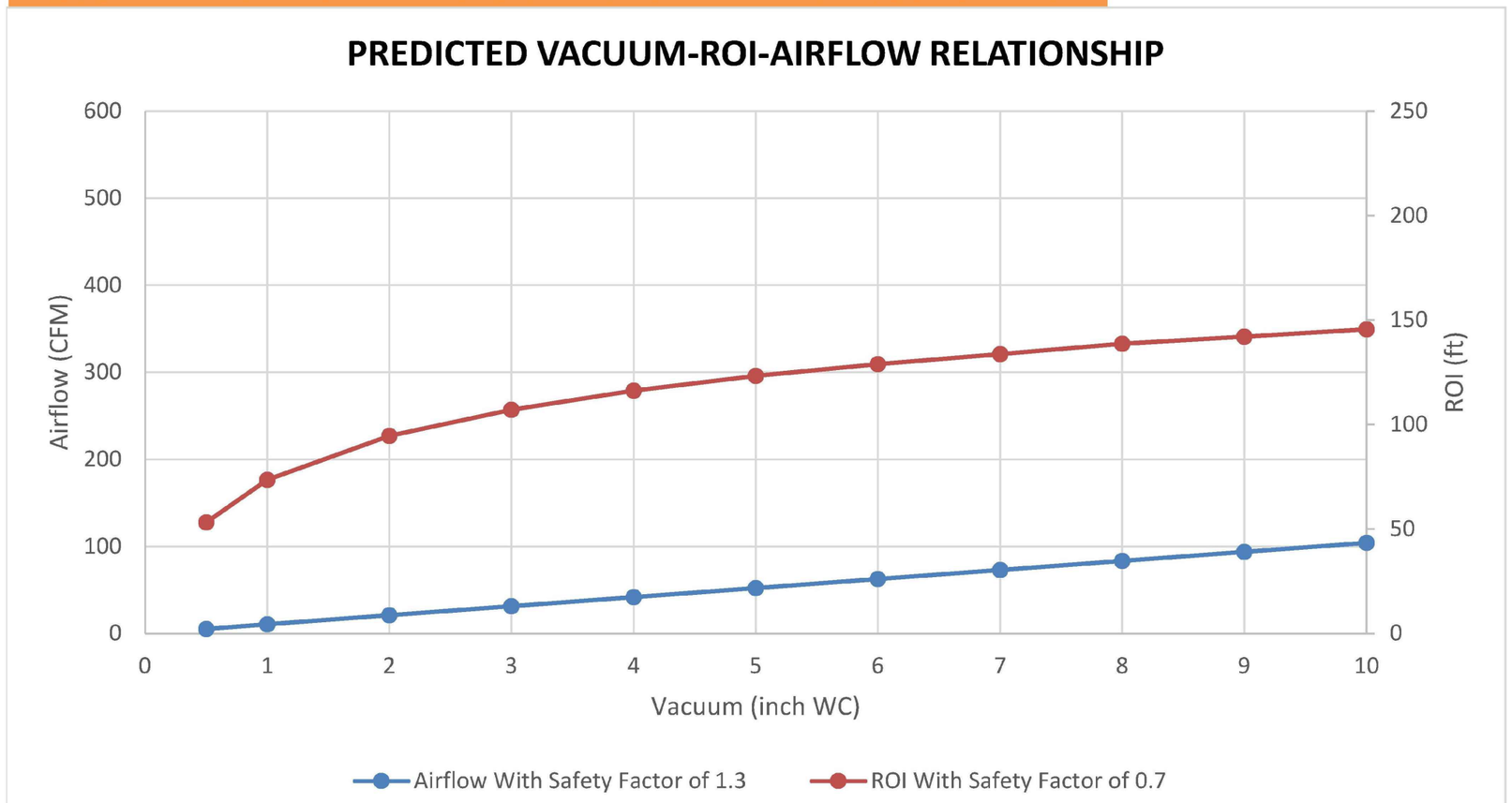

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FIGURE 5
PREDICTED VACUUM ROI
AIRFLOW RELATIONSHIP

PROJ:
VACANT LAND
3515 SECOND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: KS	DATE: 1/27/2022
VERIFY SCALE 0 NTS IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHKD BY: JP	SCALE: NTS
	FILE NAME: 01-12411-2-002F00R00	

Appendix C

PM ENVIRONMENTAL Environmental & Engineering Services

APPENDIX C.5
Checklist for Reviewing the Design of an Active Mitigation System

The information included in this checklist may be useful for reviewing the design of an active mitigation system. Though it is generally understood that the actual design of the system may vary, many of the design components should be very similar in purpose. The information in this checklist is based on American Society for Testing and Materials (ASTM Standard E2121, 2009). A blank is provided before each item to aid in documenting the individual components and where they can be found.

Site Name: Formerly Vacant Property Located Northeast of Lincoln Street and South of Holden Street **Site ID:** N/A

Site Address: 1331 Holden Street Detroit, MI **County:** Wayne County

1.0 DEFINITIONS

Backdrafting:	A condition where the normal movement of combustion products up a flue (due to the buoyancy of the hot flue gases) is reversed, so that the combustion products enter the building (see *pressure-induced spillage*).
Depressurization:	A negative pressure induced in one area relative to another.
Diagnostic tests:	Procedures used to identify or characterize conditions under, beside, and within buildings that may contribute to radon entry or elevated radon levels or that may provide information regarding the performance of a mitigation system.
Manifold piping:	Piping that collects the flow of soil gas from two or more suction points and delivers that collected soil gas to the vent stack piping. In the case of a single suction point system, there is no manifold piping since the suction point piping connects directly to the vent stack piping. The manifold piping starts where it connects to the suction point piping and ends where it connects to the vent stack piping.
Mitigation system:	Any system or steps designed to reduce concentrations of a contaminant in the indoor air of a building that originates in the subsurface.
Natural draft combustion appliance:	Any fuel burning appliance that relies on a natural convective flow to exhaust combustion products through flues to outside air.
Pressure-field extension:	The distance that a pressure change, created by drawing soil gas through a suction point, extends outward in a sub-slab gas permeable layer, under a membrane, behind a solid wall, or in a hollow wall (see *communication test*).
Pressure-field extension test:	A diagnostic test to evaluate the potential effectiveness of a sub-slab depressurization system by applying a vacuum beneath the slab and measuring, either with a micromanometer or with a heatless smoke device, the extension of the vacuum field.
Pressure-induced spillage:	The unintended flow of combustion gases from an appliance/venting system into a dwelling, primarily as a result of building depressurization (see *backdrafting*).

2.0 GENERAL

__X__ Report identifies that the design does not interfere with the normal venting functions for appliances and backdrafting will not occur. **Sections 2.0 & 3.0 This is a new construction building. The system presented in the design and specifications plan set in Appendix A is not anticipated to cause any backdrafting at a low operating vacuum of 1 inch water column.**

__X__ Pressure field extension test (e.g., diagnostic communication test) has been performed. **Building is a new construction, however a relationship between vacuum, ROI, and expected airflow was predicted using an airflow model, included in Appendix H.**

- *For buildings over 10,000 square feet multiple tests throughout the building are completed.*

__X__ Detailed specifications are provided on products utilized including fan, piping, and caulk. **Appendices A, B, D, and F**

__X__ System is designed by a professional engineer with demonstrated experience designing mitigation systems.

__X__ Building/Fire Codes: Document states mitigation systems shall be designed and installed to conform to applicable building and fire codes and maintain the function and operation of all existing equipment and building features including doors, windows, access panels, etc.

__N/A__ Discharge Calculations: Estimated calculations for discharge pursuant to Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) and the associated Administrative Rules. Single-family homes are exempt. **Based on the VB/SSD design, the VOC emissions are expected to be exempt from permit to install. Actual emission will be computed upon system start up.**

3.0 SYSTEM SEALING REQUIREMENTS

Openings that could lessen the effectiveness of the mitigation system are sealed using methods and materials that are permanent and durable.

X Cracks and joints: **Section 3.5-3.6**

__X__ Openings and cracks where the slab meets the foundation wall have been addressed.

__X__ Concrete slab (flooring) above the active mitigation system is free of cracks or cracks have been adequately sealed.

__X__ For joints greater than 1⁄2 inch (13 millimeters) in width, a foam backer rod or other comparable filler material should be inserted into the joint before the application of the sealant.

X Penetrations: **Section 3.5-3.6**

__X__ Openings around the suction point piping penetrations of the slab have been adequately addressed.

__X__ Vaults, sumps, other large openings, and utility access points in the foundation walls and/or floor slab are sealed using measures that still allow future access.

4.0 SYSTEM MONITORS AND LABELING **Sections 3.1, 3.4.1, and 3.7**

__X__ Mitigation systems contain mechanisms to monitor performance (airflow or pressure).

__X__ Mechanism is simple to read and interpret and is located where it is easily seen or heard.

__X__ System provides a visual and/or audible indication of system degradation and failure.

X Monitor has reliable power source:

__X__ If powered by house current, it shall be installed on a non-switched circuit and be designed to reset automatically after a power failure. Battery backup for the monitoring system in the event of power failure is recommended.

OR

_____ If the monitor is battery powered, it shall be equipped with a low-battery power warning feature.

__X__ Mechanical system monitors, such as manometer type pressure gauges are clearly marked to indicate the initial pressure readings.

__X__ System labels are placed on the mitigation system, the electric service entrance panel, and other prominent locations including the exterior venting locations.

__X__ The circuit breaker(s) controlling the circuits on which the mitigation system and system failure warning devices operate are labeled using the word "Vapor Mitigation." For example, "Vapor Intrusion (VI) System" or if multiple circuits "VI System" and "VI Monitor" as appropriate. No other rooms or appliances should be on the same circuit.

__X__ Description of signage and locations are provided.

- *Contain language indicating the mitigation vent that may contain volatile organic compounds.*
- *Figure identifying locations of all signs.*
- *Each roof exhaust point.*
- *Piping run (each individual exhaust line).*
  - *Vertical one per floor.*
  - *Horizontal one per 25 feet.*

__TBD__ For tenants that will be occupying the structure, a notice has been prepared and provided for review.

This notice will be prepared and submitted by the owner.

5.0 PIPING Section 3.4.1

__X__ All pipe joints and connections, both interior and exterior, are permanently sealed.

__N/A__ System piping installed in the interior or on the exterior of a building should be insulated where condensation may occur inside the pipe; and then freeze or block the soil gas exhaust.

__X__ Suction point pipes are supported and secured in a permanent manner that prevents their downward movement to the bottom of suction pits, sump pits, or into the soil.

__X__ Horizontal piping runs in the mitigation system are sloped to ensure condensation drains downward into the ground beneath the slab.

__X__ All vent stack piping is identified as solid, rigid pipe.

_____ For structures less than 2,500 square feet.

- *Exhaust piping not less than three inches (75 millimeters) inside diameter (ID).*
- *Vent stack piping's ID shall be at least as large as used in the manifold piping.*
- *Manifold piping's ID shall be as large as used in any suction point.*
- *Manifold piping to which two or more suction points are connected shall be at least four inches. (100 millimeters) ID.*
- *If smaller IDs are proposed, appropriate documentation showing design calculations has been submitted.*

OR

__X__ For structures greater than 2,500 square feet.

- *Pipe sizes are identified and justified by field diagnostic measurements and estimated static pressure, air velocity, and rate of airflow measurements.*
- *Piping sizes are justified using the methodologies found in "Industrial Ventilation: A Manual of Standard Practice, 23rd Edition," or its equivalent.*

6.0 PIPING COMPLETION SPECIFICATIONS

Discharge pipes from the SSD fans are specified as open end due to positive pressure and to ensure effective system operation without back pressure. Rain caps are not necessary and will negatively impact the vertical emission of exhaust air by dissipating horizontally.

N/A Pipes are completed with a rain cap or wind turbine.

X To reduce the risk of vent stack blockage, confirm that the discharge from vent stack pipes is:

- *Vertical and upward, outside the structure, at least ten feet (three meters) above the ground level, above the edge of the roof, and shall also meet the separation requirements below. Whenever practicable, they shall be above the highest roof of the building and above the highest ridge.*
- *Twenty feet (six meters) or more away from any window, door, or other opening into conditioned or otherwise occupiable spaces of the structure, if the discharge point is not at least three feet (one meter) above the top of such openings.*
- *Twenty feet (six meters) or more away from any opening, vent, or occupiable spaces of any building (including adjacent structures). Chimney flues shall be considered openings into conditioned or otherwise occupiable space.*
- *For vent stack pipes that penetrate the roof, the point of discharge shall be at least 12 inches (0.3 meters) above the surface of the roof. For vent stack pipes attached to or penetrating the sides of buildings, the point of discharge shall be vertical and a minimum of 12 inches (0.3 meters) above the edge of the roof and in such a position that it can neither be covered with snow or other materials nor be filled with water from the roof or an overflowing gutter.*
- *When a horizontal run of vent stack pipe penetrates the gable end walls, the piping outside the structure shall be routed to a vertical position so that the discharge point meets the requirements described above.*
- *Points of discharge that are not in a direct line of sight from openings into conditioned or otherwise occupiable space because of intervening objects such as dormers, chimneys, windows around the corner, etc., shall meet the separation requirements as stated above.*

7.0 FAN INSTALLATION REQUIREMENTS

X Fan sizing calculations are provided that estimate the pressure difference and airflow characteristics under which the system will operate. **Appendix B**

Schematics identify:

X Fan(s) are to be installed either outside the building or inside the building, outside of occupiable space, and above the conditioned (heated/cooled) spaces of a building.

X Fan(s) that are mounted on the exterior of buildings are rated for exterior use or installed within a weather proof protective housing.

X Fan(s) are to be connected to the vent pipe using removable couplings or flexible connections that can be tightly secured to both the fan and the vent pipe (facilitate maintenance and future replacement).

N/A Outside air intake vents of fan(s) are screened to prevent the intake of debris. Screens shall be removable to permit cleaning or replacement and building owners shall be informed of the need to periodically replace or clean such screens.

8.0 ADDITIONAL REQUIREMENTS IN THE DESIGN DOCUMENT

__X__ Contractor identifies steps to document the effectiveness of the mitigation system. This is typically demonstrated by measuring the pressure differential across the building slab while the VI mitigation system is operating. **Sections 3.0, 4.0 , 5.0 & 6.0 and Appendix G**

__X__ Concentrations in the subsurface have been evaluated for the duration and frequency which the system can be out-of-service (including power outages) prior to implementing actions necessary to address the potential risk to the occupants. ***Sections 7.0 and 8.0. Short response time of 48-hours and repair within 10 days is anticipated to be adequately protective**

__X__ Actions are identified to address conditions during periods the system is not operating. ***Sections 7.0 and 8.0**

__X__ Establish and identify a negative pressure that will be continuously maintained.

- Typically requires higher negative pressure than a radon mitigation system. **Sections 3.1 and 5.2**
- Establish a monitoring program.

__TBD__ Establish a monitoring program for Permit or Permit to Install Exemption pursuant to the Part 55 Rules.

Based on the known site conditions and the SSD System design, it is not anticipated that more than de minimis VOC concentrations will be emitted by the systems, but After the systems are comissioned, discharge samples will be collected and calculations performed to verify this assumption and reported in the Startup as-built report.

9.0 REFERENCES

ASTM Standard E2121. 2009. Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings.

Appendix D

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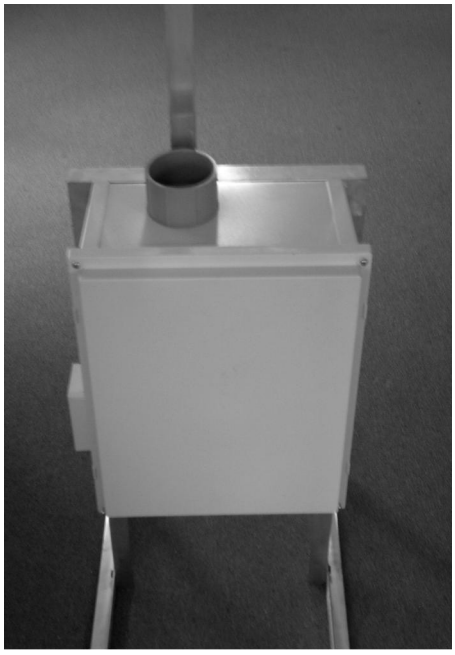
THE OBAR GBR89
COMPACT RADIAL BLOWER

Based on 25 years of experience and 2 years of research and development, the patent pending GBR series of compact radial blowers provide the perfect combination of performance and design.



GBR89 WITH ROOF MOUNT

PERFORMANCE

- GBR89 HA 14" WC at 100CFM max flow 500 CFM.
- Built in speed control to customize performance.
- Condensate bypass built in.
- 12 month warranty 40,000 hr sealed bearings.

DESIGN

- Our modular design means the blower and manifold assembly can be removed and replaced as a unit. This makes repairs cost effective and easy and allows contractors to upgrade systems simply by swapping assemblies.
- The GBR series is based on a bypass blower designed to handle combustible materials.
- The housing is not required to be air tight so you can add gauges and alarms without compromising the system.
- Built in condensate bypass.
- Built in speed control.
- Quick disconnect electrical harness.
- All UL listed components including UL listed enclosure for outside use.
- Wall fastening lugs included.
- GBR series roof and wall mounts available to quickly configure the blowers for your installation while providing a custom built look.
- Compact design 18"x 16"x 10" weighing only 18 lbs.
- 4" schedule 40 inlet and 6" schedule 40 exhaust.

1. COST	GBR89 HA
COMPLETE UNIT	**$1,789.00**
3 YEAR WARRANTY	**$650.00**

Enclosure Specifications
Rating:

Ingress Protection (EN 60529): 66/67

Electrical insulation: Totally insulated

Halogen free (DIN/VDE 0472, Part 815): yes

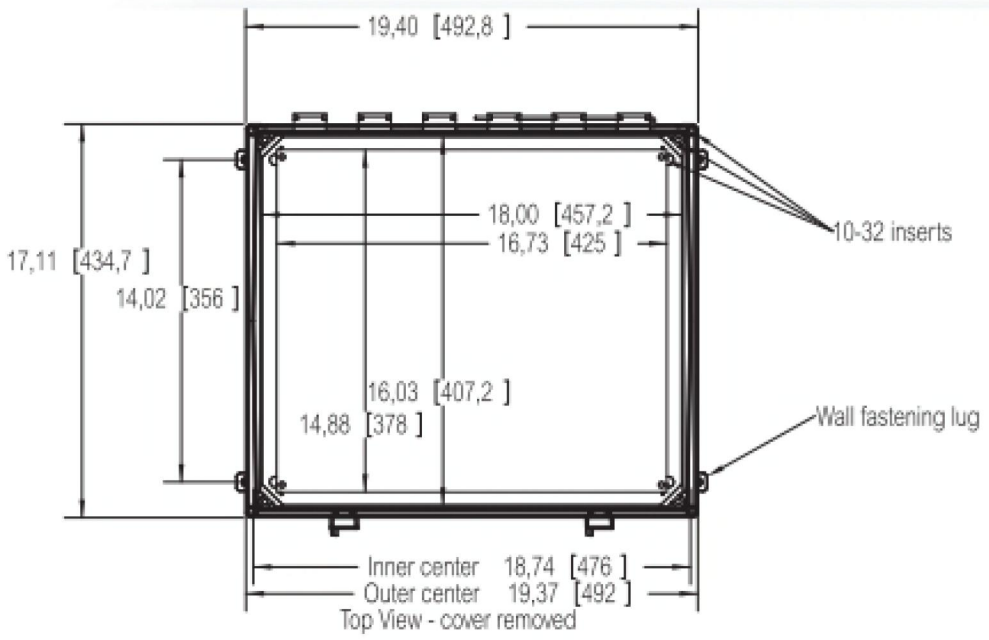
UV resistance: UL 508

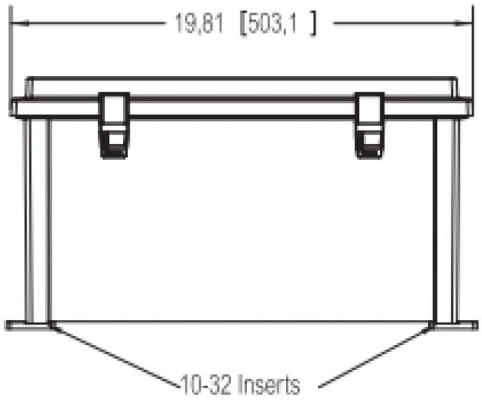
Flammability Rating (UL 746 C 5): complies with UL 508

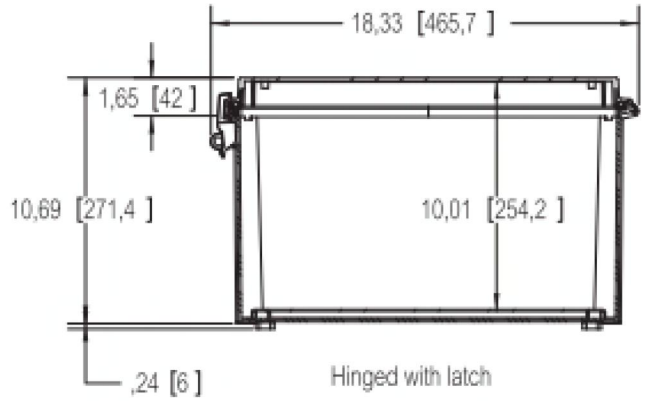
Glow Wire Test (IEC 695-2-1) °C: 960

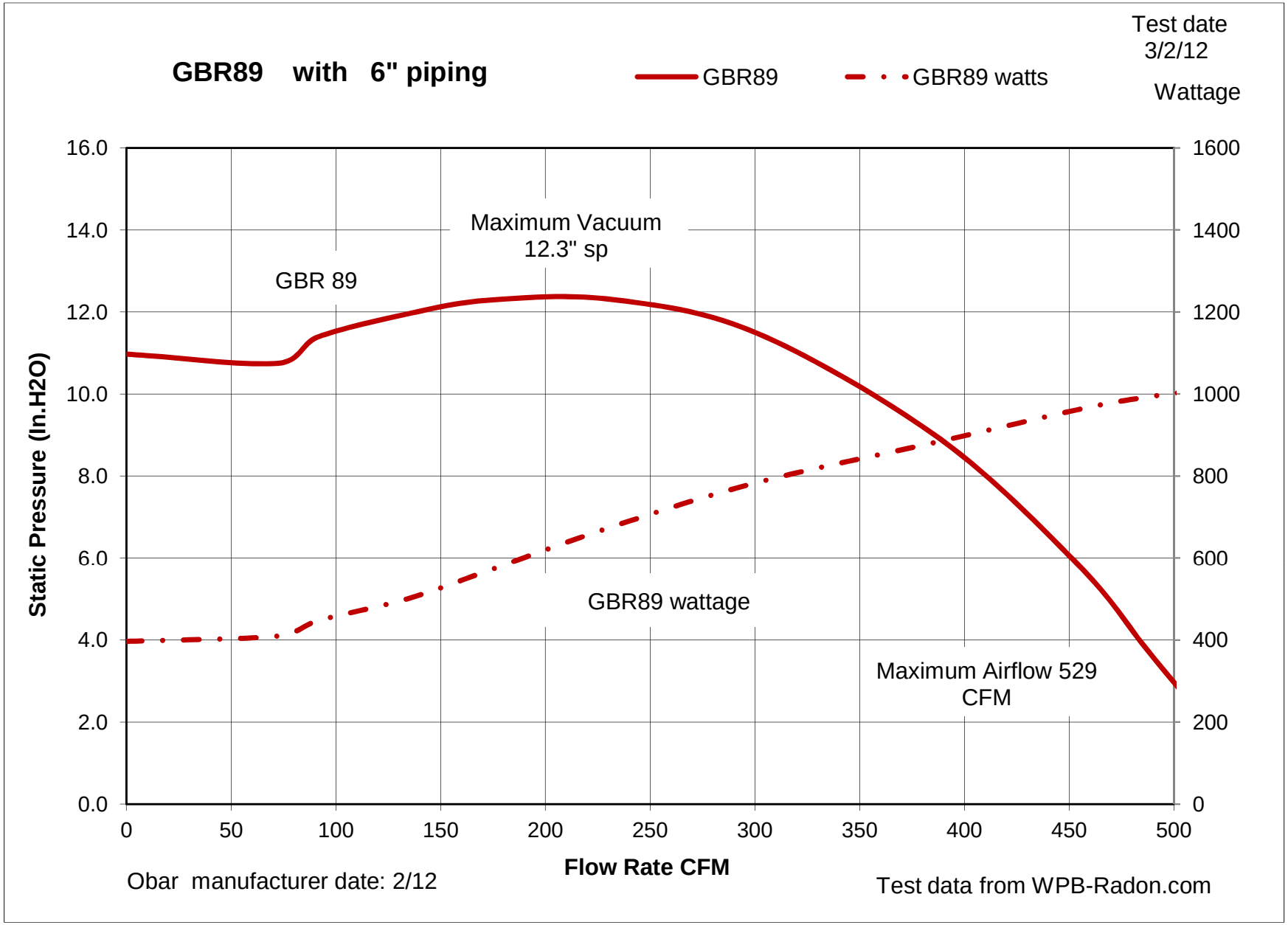
NEMA Class: UL Type 4, 4X, 6, 6P, 12 and 13

Certificates: Underwriters Laboratories





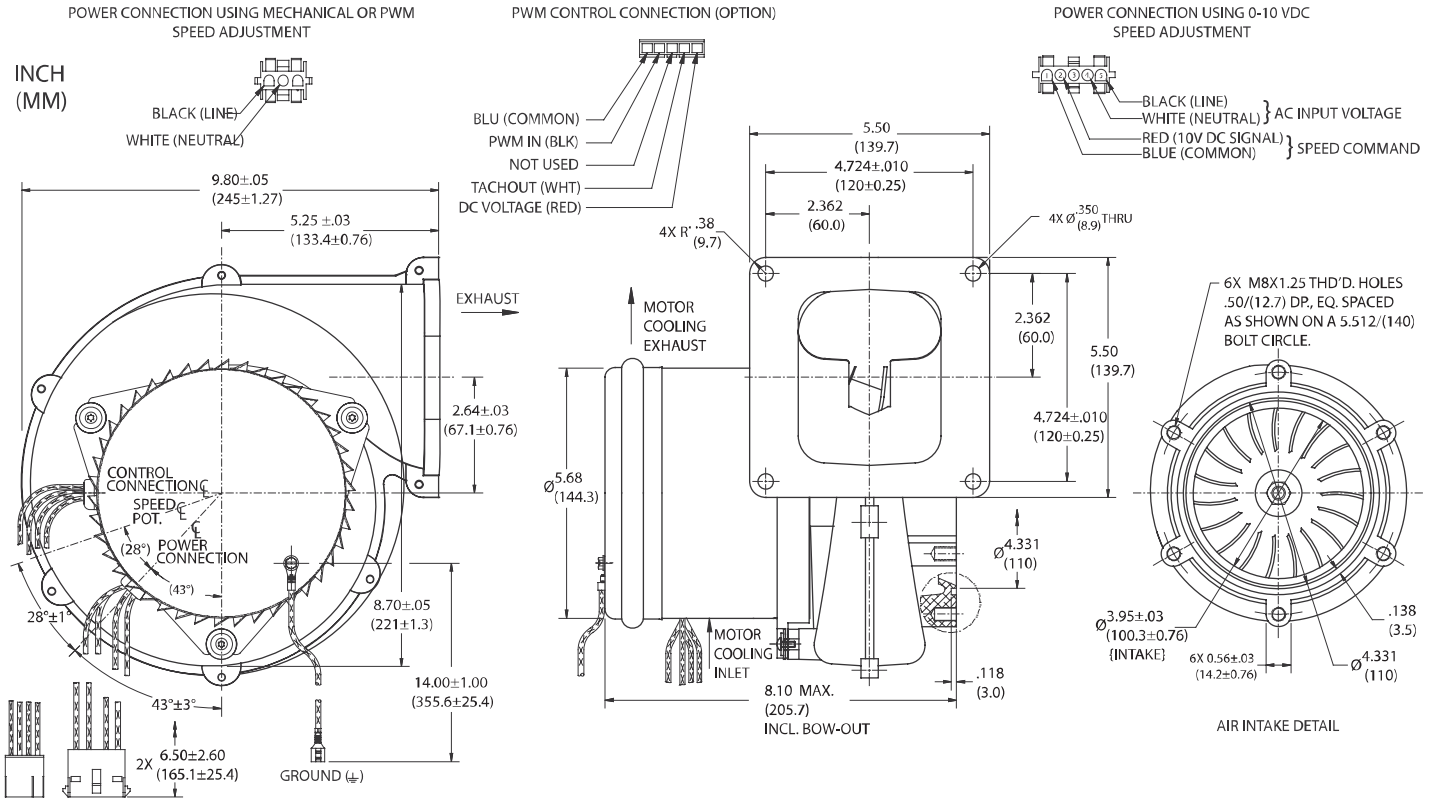



GBR89 with 6" piping
GBR89
GBR89 watts
Test date
3/2/12
Wattage
Maximum Vacuum
12.3" sp
GBR 89
GBR89 wattage
Maximum Airflow 529
CFM
Static Pressure (In.H2O)
Flow Rate CFM
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1600
1400
1200
1000
800
600
400
200
0
0
50
100
150
200
250
300
350
400
450
500
Obar manufacturer date: 2/12
Test data from WPB-Radon.com

High Voltage Brushless DC Blowers

Nautilair (TM) 8.9" (226mm) Variable Speed Blower

240 Volt AC Input, Single Phase, High Output



		Part/ Model Number		
Specification	Units	150240	150241	150242
Speed Control	-	Mechanical	0-10 VDC	PWM

Notes:

- **Input Voltage Range:** 216 - 264 Volts AC RMS, 50/60 Hz, single phase.
- **Input Current:** 10 amps AC RMS
- **Operating Temperature (Ambient Air and Working Air):** 0°C to 50°C
- **Storage Temperature:** -40°C to 85°C
- **Dielectric Testing:** 1800 Volts AC RMS 60 Hz applied for one second between input pins and ground, 3mA leakage maximum.
- **Speed Control Methods:** PWM (Pulse Width Modulation). Speed control input signal of 15 - 45 VDC @ 500 Hz - 10 kHz, and tachometer output (2 Pulses / Revolution). Optional tachometer output (3 Pulses / Revolution).
  0 to 10 VDC with a speed control input current of 5 mA to 20 mA at 10 VDC Input with multi-turn potentiometer set to minimum resistance (fully clockwise).
  Mechanical: A potentiometer is available for speed control of the blower. The potentiometer can be preset for a specific speed. Access for speed adjustment located in motor housing.
  4-20mA speed control available.
- **Approximate Weight:** 9.3 Lbs. / 4.2 Kg.
- **Option Card available for Customization**
- **Regulatory Agency Certification:** Underwriters Laboratories Inc. UL507 Recognized under File E94403 and CSA C22.2#133 under File LR43448
- **Design Features:** Designed to provide variable airflow for low NOx & CO emission in high efficiency gas fired combustion systems. Built with non-sparking materials. Blower housing assembly constructed of die cast aluminum. Impeller constructed from hardened aluminum. Rubber isolation mounts built into blower construction to dampen vibration within the motor. Two piece blower housing assembly sealed with O-ring gasket for combustion applications. Customer is responsible to check for any leakage once the blower is installed into the final application.
- **Miscellaneous:** Blower inlet, discharge, and all motor cooling inlet and discharge vents must not be obstructed. Motor ventilation air to be free of oils and other foreign particles, (i.e. breathing quality air). Blower is to be mounted so ventilation air cannot be re-circulated.
  POWER CONNECTION (3 CAVITY): Blower connector, AMP Universal MATE-N-LOK, part no. 1-480701-0.
  POWER CONNECTION (5 CAVITY): Blower connector, AMP Universal MATE-N-LOK, part no. 350810-1.
  SPEED CONNECTION (5 CAVITY): Blower connector, Molex Mini-Fit Jr., part no. 39-01-4057.
  Mating harnesses available upon request.

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
627 Lake Street, Kent OH 44240
USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9664 - Asia: +86 21 5763 1258
www.ametektip.com

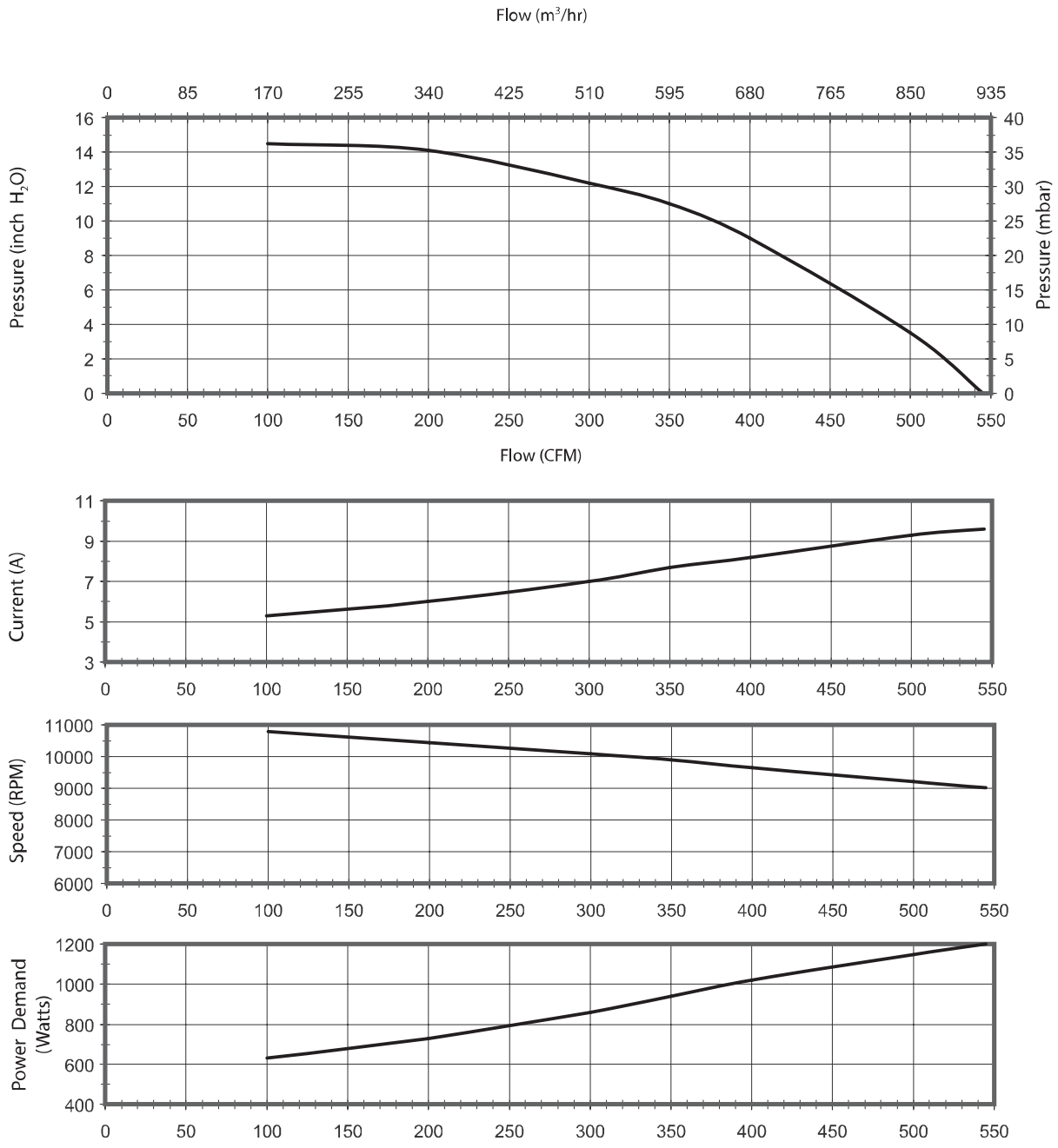
AMETEK
PRECISION MOTION CONTROL

Nautilair (TM) 8.9" (226mm) Variable Speed Blower

240 Volt AC Input, Single Phase, High Output

Nautilair

Typical Performance



Data presented represents blower performance at STANDARD AIR DENSITY, .075 lb/ft³ (29.92" Hg, Sea Level, 68° F)
Vacuum performance available upon request.

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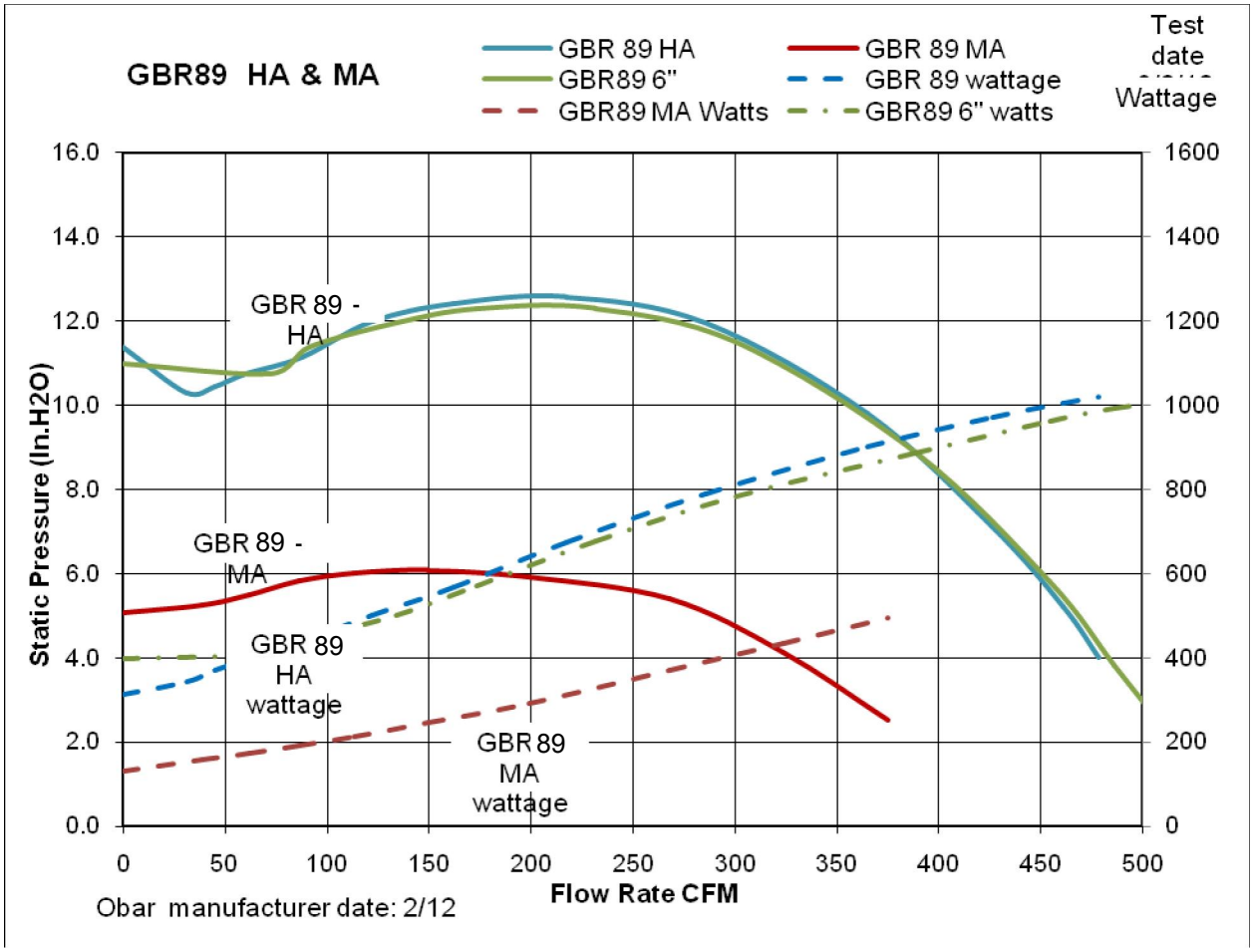
AMETEK
PRECISION MOTION CONTROL

GBR89 HA tested at full voltage with 8 feet of 4" inlet (Blue Lines) and 6" Inlet (Green lines)

Maximum airflow with no exhaust piping and 8' of 6" piping is 529 CFM

GBR89 MA tested with speed control set to half the wattage consumption (Red Line)



Cutlist:

1 1/2"-3/16" Angle

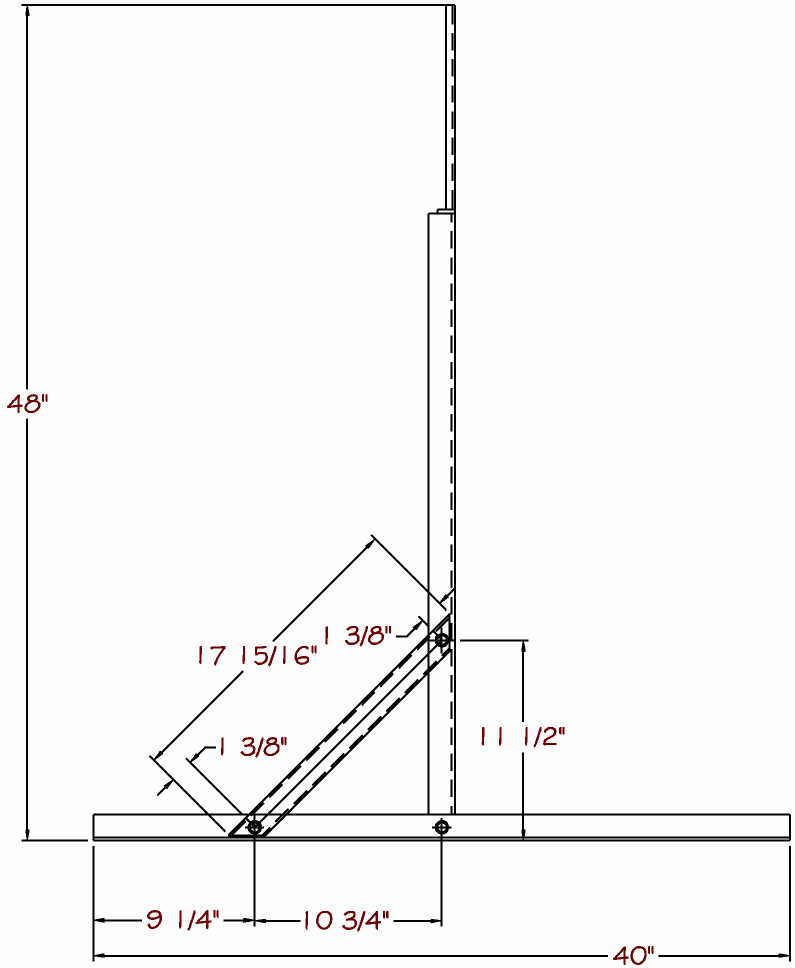
2 pcs. - 40" long square ends

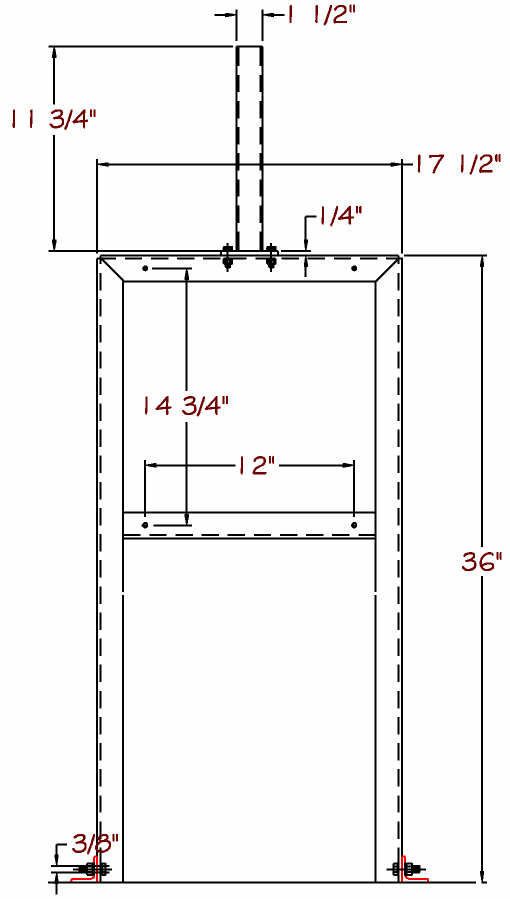
1 pc. - 17 1/8" 45 deg. P-F both ends
1 pc. - 17 1/8" coped both ends
2 pcs - 35 13/16" long 45deg. P-F one end
Note: Left and right on above

1 1/2" x 3/4" - 1/8 " channel

2 pcs. - 17 15/16" long 45 deg P-F both ends

1 pc. - 11 3/4" long Square ends





AWS D1.1 Certified

File Name:	Obar_Systems_2011.dwg
DRAWN by:	Jim Stanlick
CHECKED:	

UNLESS OTHERWISE SPECIFIED:
LINEAR TOLERANCES +/- 1/16"
ANGULAR TOLERANCES +/- 1 °

NOTES:

REV. 1

MATERIALS:
6061 Aluminum

FINISH:
Painted Finish

APPROVAL:

APPROV. FOR PRINTS:	REV.	DATE:	REQ'D:	BY:	DESCRIPTION:

Detail of:
Alum. Frame - Fan Box
Free Standing Unit

Project Name & Location:

Contractor:
OBAR Systems

Architect:

Architect's Drawing Reference:

PRECISION WELDING
"Quality Metal Fabricators"
845 Berkshire Valley Road
Wharton, NJ 07885
(973) 214-1065
(973) 695-1308 eFax
www.precweld.com

Appendix E

PM ENVIRONMENTAL Environmental & Engineering Services

SSD System Commissioning Log

Location: 3515 2ND Ave Detroit, Michigan

Date_____ Time _____ Personnel onsite_____

Sub-Slab Depressurization (SSD) Commissioning/Performance Monitoring

Site investigations activities identified concentrations in soil and soil vapor samples that exceed applicable criteria and/or screening levels.

The system construction is summarized as follows:

Address/Location	Piping	Extraction	Fans	Test Ports
3515 2nd Ave Detroit, MI	3" sch 40 PVC 4" sch 40 PVC	12 Extraction Points EX-1 through EX-12	2x Obar GBR89	14 in-slab VaporPins® (MP-1 through MP-14) 12 in riser test ports (EX-1 through EX-12)

Proper commissioning of the SSD system requires that performance monitoring activities be conducted in to document that the system is operating as designed to prevent contaminant vapor intrusion to the subject property building. Records of the performance monitoring activities must be maintained for at least 3-years following each event.

- Initial dally inspection and monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02 in WC at all testing points for one week at system startup.
- Weekly inspection and monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02" WC at all testing points for the first month.
- Monthly inspection and monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02" WC at all testing points for the first Quarter.
- Quarterly inspection and monitoring of Pressure Field Extension (PFE) to ensure a vacuum greater than 0.02" WC at all testing points for the remainder of the first year.

The activities include the following, which are to be recorded on the SSD System Log form:

1. Interior Building Slab Inspections: This activity includes a visual inspection of the floor slab, and interior perimeter areas of the budging for significant cracks (i.e., 1/2-inch or greater), missing or damaged concrete, or damaged/missing test, each of which are an indication that the SSD system may no longer be effective in those areas.

   If any of the above are identified, they must be repaired with concrete, an expandable/self-leveling urethane crack sealant, or a replacement test port within 7-days of discovery.

2. Vent Riser and Fan Inspections: This activity includes a visual inspection of vent-risers cracks or damage. Each fan is also to be inspected (audible indication) to verify that they are operable. Each vent riser is connected to a system alarm, which is also to be inspected to verify they are in good working condition.

SSD System Commissioning Log

Location: 3515 2ND Ave Detroit, Michigan

Date_____ Time _____ Personnel onsite_____

If any of the above are identified, they must be repaired or replaced within 7-days of discovery.

3. System Vacuum Measurements: This activity includes the collection and recording of vacuum measurements from test ports and vent riser test ports at vent-risers using a digital manometer to document that a minimum SSD system vacuum of -0.02 inches of water (-5 pascals) is maintained in the riser piping and beneath the floor slab. However, if tracked seasonally, a persistent negative pressure (i.e., vacuum) may indicate a protective condition even if not meeting the target vacuum.

Inadequate system vacuum must be addressed within immediately upon discovery. Air monitoring will be required until system operations are re-established. A photoionization detector (PID) will be utilized in necessary areas which will need to be accessed until system operations are re-established. Continued safe occupancy shall be thoroughly evaluated if an action level of 10 parts per million (ppm) is exceeded. If sustained PID readings above the 10-ppm action level are identified or sustained in the breathing zone, then the work area will be cleared until ambient air concentrations/levels are below the established action levels.

In the event of a persistent power outage or other system failure, the building will be evaluated for continued safe occupancy until system operations are re-established. An evaluation may be performed to document rebound and migration of concentrations of contaminants in the event the system is not operating to establish a time period that remains safe to occupy the building in the event of a power outage or other case when the system is not operating.

If it is not possible to implement system repairs within 48 hours, an alternative VI Mitigation strategy must be implemented up to and including building evacuation until the system operations are re-established to prevent unacceptable exposures.

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SSD System Commissioning Log

Location: 3515 2ND Ave Detroit, Michigan

Date_____ Time _____ Personnel onsite_____

System status upon arrival: ONLINE/OFFLINE

Interior Building Slab Inspection

This activity includes a visual inspection of the floor slab and interior perimeter areas of each unit within the subject property building for significant cracks (i.e., 1/2-inch or greater), missing or damaged concrete, areas where utility penetrations are damaged or missing, or damaged/missing test points

If any of the above are identified, they must be repaired with concrete, an expandable/self-leveling urethane crack sealant, or a replacement vapor pin within 48 hours of discovery.

Note: If construction or utility repair activities occur that involve removal of the concrete floor slab, the vapor mitigation system may no longer be effective in those areas. The disturbed area must be repaired or replaced with an equivalent material.

Are any areas of the concrete floor slab damaged, cracked (1/2 inch or greater) or missing areas of concrete, or are areas where utility penetrations are missing or damaged?		
Location	Yes/No	Comments/Action Taken
System 1		
System 2		
Are vacuum test ports TP-1 through TP-10 damaged or missing?		
Location	Yes/No	Comments/Action Taken
MP-1		
MP-2		
MP-3		
MP-4		
MP-5		
MP-6		
MP-7		
MP_8		
MP-9		
MP-10		
MP-11- MP-14		

Comments on Building Changes, and Other Observations (if any):

SSD System Commissioning Log

Location: 3515 2ND Ave Detroit, Michigan

Date_____ Time _____ Personnel onsite_____

Vent Riser and Fan Inspections

1. This activity includes a visual inspection of vent-risers for cracks or damage. Each fan is also to be inspected (audible indication) to verify that they are operable.

   If any of the above are identified, they must be repaired or replaced within 7-days of discovery.

Vent Riser Location	Is the Vent Riser piping in Good Condition? (yes/no)	Is the Fan Operational? (yes/no)	Comments/Action Taken
Fan-System 1			
Fan-System 2			

System Vacuum Measurements

Using a digital manometer, collect vacuum measurements from vacuum test ports and vent riser test ports to verify that a minimum vacuum pressure of -0.02 inches of water (-5 pascals) is present. If inadequate system vacuum is identified, system repairs must be conducted.

1. Observe the test port to verify the pin and the seal is in good condition and the pin is free of debris and/or water. Refer to included Figure for location identification.
2. Confirm units on the measurement device.
3. Affix measurement device to the test port and verify the measurement apparatus has a good seal.
4. Record measurements. Target measurement is -0.02 inches water column (inWC) or -5 pascals. Note that the setting on the instrument may depict positive values if reading the "vacuum". Verify the mode of the instruments to confirm the correct measurements are collected.
5. If measurements are less than the target, a qualified contractor will be contacted to evaluate the system operation to determine if adjustments are required.

Location	Pressure Reading Units:_____	Is Pressure < -0.02 inWC or < -5 pascals (yes/no)	Are test ports free of debris and/or water? (Yes/No)	Comments/Action Taken
Floor Slab Test Ports				
MP-1				
MP-2				
MP-3				
MP-4				

SSD System Commissioning Log

Location: 3515 2ND Ave Detroit, Michigan

Date_____ Time _____ Personnel onsite_____

Location	Pressure Reading Units:_____	Is Pressure < -0.02 inWC or < -5 pascals (yes/no)	Are test ports free of debris and/or water? (Yes/No)	Comments/Action Taken
MP-5				
MP-6				
MP-7				
MP-8				
MP-9				
MP-10				
MP-11-14				
Vent Riser Test Ports				
EX-1				
EX-2				
EX-3				
EX-4				
EX-5				
EX-6				
EX-7				
EX-8				
EX-9				
EX-10				
EX-11				
EX-12				

Note: inadequate vacuum, excessive vacuum based on fan specifications, or unusual flow could be indicative of a piping leak, damaged or weak fan, or blocked vent piping/riser.

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Appendix F

PM ENVIRONMENTAL Environmental & Engineering Services

Bostik
smart adhesives

916

TEXTURED POLYURETHANE SEALANT & ADHESIVE

KEY FEATURES

- Permanently flexible
- Tenacious bond to difficult substrates
- Low VOC

DESCRIPTION

916 is a one-component, textured polyurethane sealant capable of dynamic joint movement totaling 50% of original joint geometry (±25%). The sealant cures to a tough, flexible rubber when exposed to moisture present in the atmosphere.

916 has a consistency like toothpaste, its physical properties will remain relatively stable over time and in varying weather conditions. Its physical properties are relatively unchanged over a wide temperature range, -40°F to 150°F (-40°C to 66°C). Where smooth appearance is needed, please use Bostik 915FS™.

APPLICABLE STANDARDS

- ASTM C920, TYPE S, GRADE NS, CLASS 25, USE NT, A AND M.
- US Federal Specification TT-S 00230C (COMB-NBS) for one-component sealants as Class A, non-sag.
- CARB, SCAQMD, and OTC compliant.

BASIC USES

916 is designed for sealing expansion and control joints in pre-cast concrete panels, for sealing various siding applications, and for sealing perimeters of doors, windows, and other wall penetrations. Sealant cures to form a durable, flexible bond with most building materials in any combination including stone, masonry, ceramic, wood, steel, aluminum, Kynar® painted metals, fiber cement board and many other common building materials.

INSTALLATION PROTOCOL

Joint Design: In general, more joint movement can be accommodated in a thin bead of sealant than a thick bead. 916 should be no thicker than 1/2" (12.7mm) and no thinner than 1/4" (6.4mm). In joints between 1/2" and 1", the ratio of sealant width to depth should be approximately 2:1. Sealant depth in joints between 1/4" and 1/" should be 1/4" deep. Joints with dynamic movement should not be designed in widths less than 1/4".

Surface Preparation: Surfaces must be structurally clean, dry (no frost) and structurally sound, free of contaminants, including, but not limited to, dust, dirt, loose particles, tar, asphalt, rust, mill oil, etc. If substrate is painted or coated, scrape away all loose and weakly bonded paint or coating. Any paint or coating that cannot be removed must be tested to verify adhesion of the sealant or to determine the appropriate surface preparation if needed. (See ASP section on next page for details.)

Backer Rods and Bond Breaker Tapes: Bond breakers including, but not limited to, closed-cell polyethylene backer rods are used to control depth of the sealant bead, provide a firm tooling surface and avoid three-sided adhesion. Where the depth of joint prevents use of backer rods, a polyethylene strip or tape must be used as a bond breaker to prevent 3-sided adhesion. Do not prime or damage the surface of the bond breaker. Refer to instructions given by rod and tape manufacturers for the correct backer rod and tape size related to joint size.

Tooling: 916 comes ready-to-use. Cut spout or tip to desired bead size. Apply moderate pressure to break seal inside the nozzle. Apply by using a professional caulking gun. Use opened cartridges and sausages the same day they are opened. Apply 916 in a continuous operation using positive pressure to the bottom

This supersedes and replaces in its entirety all previously published versions of this document.
T13195 (Last revised on 02.05.19)

of the joint to properly fill and seal the joint. When applying, avoid air entrapment and overlapping. Tool the sealant before the skin forms with adequate pressure to spread the sealant against the backup material at the bottom and sides of the joint. A dry tool with a concave profile is recommended for that operation. Do not use water or soapy water for this operation. Avoid smearing and feathering of the sealant to allow full performance of the cured seam. Excess sealant should be dry-wiped or joints should be properly taped.

Cleaning: After dry-wiping uncured sealant from substrates and tools, remaining uncured sealant can be removed by using mineral spirits. Cured sealant is usually very difficult to remove without altering or damaging the surface to which the sealant has been misapplied. Cured sealant can be removed by abrasion or other mechanical means (scrapers, putty knives).

Curing Time: 916 is a moisture cure, polyurethane sealant. On wood, with ambient air at 50% relative humidity and at 73°F, polyurethane sealants will generally skin within four hours and cure 1/16 of an inch per day. Lower temperature and lower relative humidity will significantly increase the skin time and cure time of a polyurethane sealant.

Maintenance: If the sealant becomes damaged, replace the damaged portion by removing the old sealant completely, cleaning the surfaces and reapplying a fresh and appropriate amount of new sealant in accordance with the directions and information contained in this data sheet.

MANDATORY ADHESION TO SUBSTRATES PRETEST – (ASP)

A hand pull test must be run before the job starts and at regular intervals during the job. It must be run on the job site after the sealant is fully cured, usually within 7 to 21 days. (Adhesion may develop fully after at least 14 days.) The hand pull test procedure is as follows:

1. Make a knife cut horizontally from one side of the joint to the other.
2. Make two vertical cuts approximately two inches long, at the sides of the joint, meeting the horizontal cut at the top of the two-inch cuts.
3. Grasp the two-inch piece of sealant firmly between the fingers and pull down at a 90° angle or more, and try to pull the uncut sealant out of the joint.
4. If adhesion is sufficient, the sealant should tear cohesively in itself.
5. Sealant may be replaced by applying more sealant in the same manner as it was originally applied. Care should be taken to ensure that the new sealant is in contact with the original, and that the original sealant surfaces are clean, so that a proper bond between the new and old sealant will be obtained.

PACKAGING

10.1 fl. oz. (300 mL) cartridges, 24 cartridges per case
20 fl. oz. (591 mL) sausages, 12 sausages per case

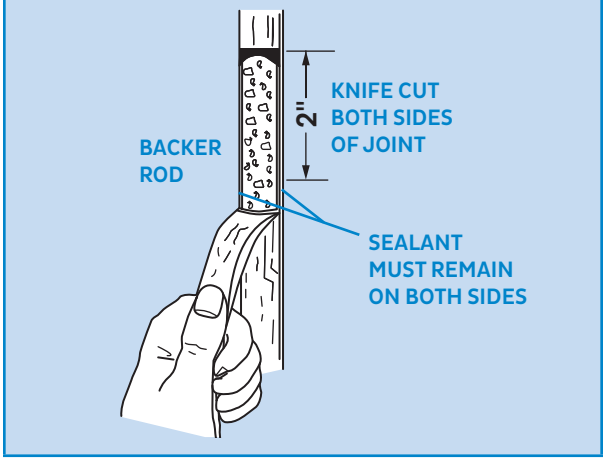
COLORS

White, Stone, and Bronze

AVAILABILITY

Available from authorized Bostik distributors. Go to www.bostik.com/us and check on our distributor locator for the closest distributor in your location or call customer service at 1-800-7/BOSTIK (1-800-726-7845).

MANDATORY ADHESION TO SUBSTRATE (ASP) FIELD TEST



STORAGE/SHELF LIFE

Store in a clean, dry area not affected by freezing or hot temperatures between 50°F (10°C) and 90°F (32°C). Shelf life is one year from date of manufacturing in unopened cartridge.

LIMITATIONS

- Construction substrates have become complex and diverse by nature and origin. Substrate chemistries and structures can interfere with adhesive performances of the sealant. Adhesion to Substrate Pretest (ASP) is therefore **MANDATORY** to assess any adhesion and sealing characteristics – see Adhesion to Substrates Pretest section and see Installation Protocol section. This must be done pre-installation to avoid potential failures. Call Technical Service for more information about surface preparation and possible priming.
- Do not apply over damp, contaminated, loose surfaces (See Installation Protocol and Surface Preparation), old sealants or other foreign substances that may impair the adhesion bond. Avoid air entrapment.
- Dampness and substrates with high moisture content will trigger extensive curing of the sealant within a very short period of time. This may cause an excess of bubbling and foaming within the sealant and at the bottom of the bead. High temperature/humidity can cause the sealant to develop bubbles during the curing process. Sealant installation is not recommended when the dew point of the substrate is close to ambient temperature or a moisture-vapor transmission condition is present increasing the potential for bubbling to form during cure. Porous substrates such as, but not limited to, marble, limestone, and granite might absorb components of the 916 leading to staining of the substrate. **ASP with sufficient aging is mandatory to assess this potential issue.**
- 916 must not be used to seal narrow joints, fillet joints and face nail holes.
- Smearing and feathering 916 over joints is not recommended.
- 916 is not recommended for horizontal joints or traffic-bearing joints where abrasion resistance is required (walkways, driveways, runways, etc.). Please refer to Bostik 955-SL™ for this application.

- 916 is not recommended for continuous immersion in water or any other fluid. When fully cured, avoid exposure, even incidental, to fuels, chlorinated, acid and alkaline solutions. 916 is not recommended for exterior or interior sealing below the waterline; please refer to Bostik 940 Fast Set for marine applications.
- Contact of 916 with asphalts (i.e., back coating of window flashing, etc.) and other filler compounds impregnated with oil, asphalt, tar, etc., may deteriorate the cohesive strength of the substrate and ultimately compromise the seal. Please refer to Bostik PRO-MS 50™ for asphalt compatibility applications.
- Lower relative humidity and temperature will significantly extend the curing time. Confined areas, deep joints and moisture barrier substrates may also affect the full cure time and extend it by many days. Apply sealant in ambient air temperature of 40°F. and rising.
- Until the sealant is fully cured, do not expose the sealant to any mechanical stress. Uncured sealant will not respond properly to cyclic expansion and contraction of the joint specified for the cured sealant only.
- 916 is not recommended for glazing applications. Bond line strength can be affected by UV rays through the clear material (glass, acrylic glass, polycarbonate, etc.).
- Do not paint over the polyurethane sealant until it has fully cured.
- The surface of a 916 seal when exposed to UV rays and sunlight will yellow and will not retain its gloss. This phenomenon can occur within a few weeks after exposure. The change of color is limited to the surface layer of the seal and should not compromise the sealing properties of the 916 if the dimensions of the joint are proper and the sealant is otherwise properly applied. In areas where color retention is critical, please refer to Bostik PRO-MS 50™.

CAUTION

IRRITANT. MAY BE HARMFUL IF SWALLOWED OR INHALED. CONTAINS POTENTIAL SENSITIZER. MAY CAUSE ALLERGIC SKIN OR LUNG REACTION. MAY IRRITATE EYES, SKIN AND RESPIRATORY TRACT. Do not breathe fumes. Do not get in eyes, on skin or on clothing. Do not swallow. Use only in a well-ventilated area or wear mask. Wash thoroughly after handling. Store container in a cool, dry area with lid tightly sealed. Do not reuse container.

KEEP OUT OF REACH OF CHILDREN

FIRST AID TREATMENT

Contains petroleum resins, diisodecyl phthalate (DIDP), methylene diphenyl isocyanate (MDI), quartz silica. Methanol may form during curing. If in eyes or on skin, rinse with water for at least 15 minutes. If on clothes, remove clothes. If breathed in, move person to fresh air. If swallowed, call a Poison Control Center or doctor immediately. Do not induce vomiting.

SEE SAFETY DATA SHEET

CHEMICAL EMERGENCY: 800-424-9300 (USA),
703-527-3887 (International)
MEDICAL EMERGENCY: 866-767-5089

COVERAGE FOR 10.1 FL. OZ. (300 ML) CARTRIDGE

	width							
depth	1/8"	1/4"	3/8"	1/2"	5/8"	3/4	7/8"	1"
1/8"	99	49	33	24	20	16	14	12
1/4"		24	20	12	10	8	7	6
3/8"			11	8	6	5	5	4
1/2"				6	5	4	3	3

Linear Feet Per 10.1 FL. OZ. Cartridge

COVERAGE FOR 20 FL. OZ. (600 ML) SAUSAGE

	width							
	1/8"	1/4"	3/8"	1/2"	5/8"	3/4	7/8"	1"
1/8"	288	145	95	71	58	48	40	36
1/4"		71	58	36	29	23	20	17
3/8"			32	23	17	16	13	11
1/2"				17	14	11	10	8

Linear Feet Per 20 FL. OZ. Sausage

TABLE 1: TYPICAL UNCURED PROPERTIES*

Property	Value	Test Method/Note
Tool/Work Time	90 min.	Bostik Test Method
Skin Time	4 Hours	Bostik Test Method
Curing Time @77°F (25°C)	2-7 days	Varies w/relative humidity
Flow, Sag or Slump	0.3 inch	Bostik Test Method

* Values given above are not intended to be used in specification preparation purposes.

TABLE 2: TYPICAL CURED PROPERTIES* (AFTER 14 DAYS CURE AT 77°F AND 50% RH)

Property	Value	Test Method/Note
Hardness (Shore A)	42	ASTM D 2240
Modulus @ 100% Elongation @ 25% Elongation	65 psi 45 psi	ASTM D 412 ASTM D 412
Tensile Strength @ Break	133 psi	ASTM D 412
Elongation @ Break	685%	ASTM D 412
Adhesion Peel	>5 piw	TT-S-00230C / ASTM C 794
Joint Movement Capability	+25%	TT-S-00230C / ASTM C 719
UV Resistance	Pass	ASTM C 793

* Values given above are not intended to be used in specification preparation purposes.

LIMITED WARRANTY

It is the buyer's obligation to test the suitability of the product for an intended use prior to using it. The Limited Warranty extends only to the original purchaser and is not transferable or assignable. Any claim for a defective product must be filed within 30 days of discovery of a problem, and must be submitted with written proof of purchase. Limited Warranty found at www.bostik.com/us or call 800.726.7845. TO THE MAXIMUM EXTENT ALLOWED BY LAW, BOSTIK DISCLAIMS ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. UNLESS OTHERWISE STATED IN THE LIMITED WARRANTY, THE SOLE REMEDY FOR BREACH OF WARRANTY IS REPLACEMENT OF THE PRODUCT OR CREDIT OF THE BUYER'S PURCHASE PRICE. BOSTIK DISCLAIMS ANY LIABILITY FOR DIRECT, INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES TO THE MAXIMUM EXTENT ALLOWED BY LAW. DISCLAIMERS OF IMPLIED WARRANTIES MAY NOT BE APPLICABLE TO CERTAIN CLASSES OF BUYERS AND SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

BOSTIK HOTLINE

Smart help
1-800-726-7845

Bostik, Inc.
11320 W. Watertown Plank Road
Wauwatosa, WI 53226
www.bostik.com/us

SENSAPHONE®
REMOTE MONITORING SOLUTIONS

Sentinel Pro
Technical Specifications

ALARM NOTIFICATION METHODS:

E-Mail, Text Messages, Voice Phone Calls

Programmable alarm escalation levels

Comprehensive scheduling per input, profile, and alarm destination

Unlimited number of User Profiles

Multiple contact types per user

INPUTS:

12 Universal Inputs

- Normally Open / Normally Closed Dry Contact
- 2.8K / 10K Thermistor
- 4-20mA Current Loop
- Pulse Count
- 12 Bit Resolution

MODBUS:

- Modbus RTU via RS485
- Up to 64 registers

TEMPERATURE SENSING RANGE:

-109° to 168°F | -85° to 76°C

RELAY OUTPUT:

2 programmable relay outputs
Rated for 1A 30VAC/ 1A 30VDC

CELLULAR COMMUNICATION :

4G Cellular Modem for use on Verizon, AT&T or Rogers

DATA LOGGING:

Unlimited samples securely stored on the Sentinel servers

Programmable sampling Interval - 5 min to 24 hrs

User programmable channel selection

BATTERY BACKUP:

4.8V 2000mAHr NiMh Battery pack (included)

12V 3000 mAHR SLA Battery (included)

Provides 8 hours of backup

LOCAL INDICATORS:

12 Alarm Status LEDs

- Power LED • Online LED
- Standby LED • Ethernet link and Activity LEDs

POWER REQUIREMENTS:

Power Requirement: 12-24DC

- Comes with 12VDC plug-in power supply
- International power options available

Current Draw: 300mA at 24VDC

ENVIRONMENTAL:

Operating Humidity:
0-90% RH, non–condensing

Operating Temperature:
32° to 122°F | 0° to 50°C

PHYSICAL:

Dimensions:
12.5 x 12.2 x 7.0” | 318 x 310 x 178mm

Weight: 10.5lbs. | 4.7kg

Continued on back

STANDARDS:

FCC Part 15 – Class A Compliant

ENCLOSURE:

NEMA 4X rated plastic weatherproof enclosure

ANTENNA:

2G/3G/4G Frequencies: 698-960/1710-2700MHz

Peak gain: 5dBi

Pattern: Omni-directional

Height: 6.45” (164mm)

Diameter: 1.90” (48mm)

IP Rating: IP-66

BUILDING TRUST

PRODUCT DATA SHEET

Sikaflex® Self Leveling Sealant

High performance, self-leveling,1-part polyurethane sealant

PRODUCT DESCRIPTION

Sikaflex® Self Leveling Sealant is a single component, self-leveling, premium-grade polyurethane sealant with an accelerated curing capacity. Meets Federal Specification TT-S-00230C, Type 1, Class A. Meets ASTM C-920, Type S, Grade P, Class 25.

USES

Sikaflex® Self Leveling Sealant is used to seal horizontal expansion joints in concrete and cementitious slabs such as:

- Driveways
- Garages
- Sidewalks
- Balconies
- Pavements
- Terraces
- Warehouses
- Factories
- Civil Structures
- Plazas

CHARACTERISTICS / ADVANTAGES

- 1-component, no mixing
- Self-leveling, pourable
- Accelerated curing
- Permanently elastic
- High durability
- Resists aging, weathering
- Excellent adhesion
- Convenient, easy-to-use packaging
- Paintable with water-based, oil-based or rubber-based paints

PRODUCT INFORMATION

Packaging	10.1 fl. (299 ml) oz. moisture proof composite cartridge, 12/case 29 fl. oz. (858 ml) moisture-proof composite cartridges, 12/case
Color	Gray in 10.1 fl. oz. (299 ml) and 29 fl. oz. (858 ml) cartridges. Sandstone in only 29 fl. oz. (858 ml) cartridge
Shelf Life	12 months in original unopened packaging
Storage Conditions	Store at 40 to 95 °F (4 to 35 °C). Condition material to 65 to 75 °F (18 to 24 °C) before using

TECHNICAL INFORMATION

Shore A Hardness	40 ± 5 (21 days)	(ASTM D-2240) Tested at: 73 °F (23 °C) 50 % R.H.)
Tensile Strength	150 psi (1 MPa) (21 days)	(ASTM D-412) Tested at: 73 °F (23 °C) 50 % R.H.
Tensile Stress at Specified Elongation	110 psi at 100% (0.7 MPa) (21 days)	(ASTM D-412) Tested at: 73 °F (23 °C) 50 % R.H.
Elongation at Break	450 % (21 days)	(ASTM D-412) Tested at: 73 °F (23 °C) 50 % R.H.)
Elastic Recovery	> 90 %	

Adhesion in Peel

Substrate	Peel Strength	Adhesion Loss
Concrete	> 30 pli	0 % Adhesion Loss

(ASTM C-794)
Tested at:
73 °F (23 °C)
50 % R.H.)

Movement Capability	± 25 %
Resistance to Weathering	Excellent
Service Temperature	-40 to 170 °F (-40 to 76 °C)

APPLICATION INFORMATION

Coverage

10.1 oz (299 ml) Cartridge: Yield in Linear Feet

Width	1/4" Depth	3/8" Depth	1/2" Depth
1/4"	24.3		
3/8"	16.2	10.8	
1/2"	12.1	8.1	6.1
3/4"	8.1	5.4	4.0
1"			3.0
1-1/4"			2.4
1-1/2"			2.0

29 oz (858 ml) Cartridge: Yield in Linear Feet

Width	1/4" Depth	3/8" Depth	1/2" Depth
1/4"	69.8		
3/8"	46.5	31.0	
1/2"	34.9	23.3	17.4
3/4"	23.2	15.5	11.6
1"			8.7
1-1/4"			7.0
1-1/2"			5.8

Ambient Air Temperature	40 to 100 °F (4 to 38 °C). Sealant should be installed when joint is at midrange of its anticipated movement
Substrate Temperature	40 to 100 °F (4 to 38 °C). Sealant should be installed when joint is at midrange of its anticipated movement
Cure Time	Final Cure: 3 to 5 days
Tack Free Time	1 to 2 hours

APPLICATION INSTRUCTIONS

SUBSTRATE PREPARATION

Clean all surfaces. Joint walls must be sound, clean, dry, frost-free, and free of oil and grease. Curing compound residues and any other foreign matter must be thoroughly removed. Install bond breaker tape or backer rod to prevent bond at base of joint.

Priming is not usually necessary. Substrates only require priming if testing indicates a need. **Consult Sikaflex Primer Technical Data Sheet** or Technical Service for additional information on priming.

APPLICATION METHOD / TOOLS

Recommended application temperatures: 40 to 100 °F (4 to 38 °C). Condition sealant to 65 to 75 °F (18 to 24 °C) before using. Cut plastic tip to desired size and puncture airtight seal at base of tip. **NOT FOR SLOPED SURFACES**. Maximum sealant depth is 1/2 in. (12.7 mm) and width is 1–3/4 in. (19-25.4 mm). Minimum depth is 1/4 in. (6.3 mm) and width is 1/4 in. (6.3 mm). Pour sealant into joint slot in one direction and allow sealant to flow and level out as necessary. Tool as required, although minimum tooling is necessary. Proper design is 2:1 width to depth ratio. Always use bond breaker tape or closed cell backer rod for support on horizontal joints. Uncured material can be removed with approved solvent. Cured material can only be removed mechanically. For spillage, collect, absorb, and dispose of in accordance with current, applicable local, state, and federal regulations.

LIMITATIONS

- Allow 1 week cure at standard conditions when using Sikaflex® Self Leveling Sealant in total water immersion and prior to painting.
- Maximum exposure level of chlorine is 5 ppm.
- In joints subject to movement - maximum depth of sealant must not exceed 1/2 in. (12.7 mm); minimum depth is 1/4 in. (6.3 mm).
- Minimum depth of sealant for horizontal joints subject to traffic is 1/2 in. (12.7 mm).
- Maximum expansion and contraction should not exceed 25 % of average joint width.
- Do not cure in the presence of curing silicone sealants.
- Avoid contact with alcohol and other solvent cleaners during cure.
- Do not apply when moisture-vapor transmission condition exists from the substrate as this can cause bubbling within the sealant.
- To avoid bubbling, do not apply when ambient air and substrate temperatures exceed 100° F (38° C). In extreme summertime conditions, preferably install sealant when ambient air and substrate temperatures are falling.
- Use opened cartridges the same day.
- The ultimate performance of Sikaflex® Self Leveling Sealantdepends on good joint design and proper application with joint surfaces properly prepared.
- Do not use in contact with bituminous / asphaltic materials.
- When overcoating with water-based, oil-based or rubber-based paints, compatibility and adhesion testing of mock-up installations is essential.
- Do not use paints which are silicone based or have a high solvent content. Avoid solvent-based and alcohol-based primers, stains, sealers and coatings.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

LEGAL DISCLAIMER

- **KEEP CONTAINER TIGHTLY CLOSED**
- **KEEP OUT OF REACH OF CHILDREN**
- **NOT FOR INTERNAL CONSUMPTION**
- **FOR INDUSTRIAL USE ONLY**

• **FOR PROFESSIONAL USE ONLY**

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.**

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Standard Operating Procedure Installation and Extraction of the Vapor Pin® Sampling Device

Updated January 28, 2021

Scope:

This standard operating procedure describes the installation and extraction of the VAPOR PIN® sampling device for use in sub-slab soil-gas sampling.

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the VAPOR PIN® sampling device for the collection of sub-slab soil-gas samples or pressure readings.

Equipment Needed:

- Assembled VAPOR PIN® sampling device [VAPOR PIN® sampling device and silicone sleeve (Figure 1)]; Because of sharp edges, gloves are recommended for sleeve installation;
- Hammer drill;
- 5/8-inch (16mm) diameter hammer bit (hole **must** be 5/8-inch (16mm) diameter to ensure seal. It is recommended that you use the drill guide). (Hilti™ TE-YX 5/8" x 22" (400 mm) #00206514 or equivalent);
- 1½-inch (38mm) diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch (19mm) diameter bottle brush;
- Wet/Dry vacuum with HEPA filter (optional);
- VAPOR PIN® sampling device installation/extraction tool;
- Dead blow hammer;
- VAPOR PIN® sampling device flush mount cover, if desired;
- VAPOR PIN® sampling device drilling guide, if desired;
- VAPOR PIN® sampling device protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel for repairing the hole following the extraction of the VAPOR PIN® sampling device.

Figure 1. Assembled VAPOR PIN® sampling device

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) If a flush mount installation is required, drill a 1½-inch (38mm) diameter hole at least 1¾-inches (45mm) into the slab. Use of a VAPOR PIN® sampling device drilling guide is recommended.

4) Drill a 5/8-inch (16mm) diameter hole through the slab and approximately 1-inch (25mm) into the underlying soil to form a void. Hole **must** be 5/8-inch (16mm) in diameter to ensure seal. It is recommended that you use the drill guide.
5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.

6) Place the lower end of VAPOR PIN® sampling device assembly into the drilled hole. Place the small hole located in the handle of the installation/extraction tool over the vapor pin to protect the barb fitting, and tap the vapor pin into place using a dead blow hammer (Figure 2). Make sure the installation/extraction tool is aligned parallel to the vapor pin to avoid damaging the barb fitting.

Figure 2. Installing the VAPOR PIN®

During installation, the silicone sleeve will form a slight bulge between the slab and the VAPOR PIN® sampling device shoulder. Place the protective cap on VAPOR PIN® sampling device to prevent vapor loss prior to sampling (Figure 3).

Figure 3. Installed VAPOR PIN® sampling device

7) For flush mount installations, cover the vapor pin with a flush mount cover, using either the plastic cover or the optional stainless-steel Secure Cover (Figure 4).

Figure 4. Secure Cover Installed

8) Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.

9) Remove protective cap and connect sample tubing to the barb fitting of the VAPOR PIN® sampling device. This connection can be made using a short

piece of Tygon™ tubing to join the VAPOR PIN® sampling device with the Nylaflow tubing (Figure 5). Put the Nylaflow tubing as close to the VAPOR PIN® sampling device as possible to minimize contact between soil gas and Tygon™ tubing.

Figure 5. VAPOR PIN® sampling device sample connection

10) Conduct leak tests in accordance with applicable guidance. If the method of leak testing is not specified, an alternative can be the use of a water dam and vacuum pump, as described in SOP Leak Testing the VAPOR PIN® sampling device via Mechanical Means (Figure 6). For flush-mount installations, distilled water can be poured directly into the 1 1/2 inch (38mm) hole.

Figure 6. Water dam used for leak detection

11) Collect sub-slab soil gas sample or pressure reading. When finished, replace the protective cap and flush mount cover until the next event. If the sampling is complete, extract the VAPOR PIN® sampling device.

Extraction Procedure:

1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the VAPOR PIN® sampling device (Figure 7). Turn the tool clockwise continuously, don't stop turning, the VAPOR PIN® sampling device will feed into the bottom of the installation/extraction tool and will extract from the hole like a wine cork, DO NOT PULL.

2) Fill the void with hydraulic cement and smooth with a trowel or putty knife.

Figure 7. Removing the VAPOR PIN® sampling device

- Prior to reuse, remove the silicone sleeve and protective cap and discard. Decontaminate the VAPOR PIN®

sampling device in a hot water and Alconox® wash, then heat in an oven to a temperature of 265° F (130° C) for 15 to 30 minutes. For both steps, **STAINLESS – ½ hour, BRASS 8 minutes**

3) Replacement parts and supplies are available online.

LIQUID BOOT®

SPRAY-APPLIED GAS VAPOR BARRIER

DESCRIPTION

LIQUID BOOT® is a seamless, spray-applied, water-based membrane containing no VOCs, which provides a barrier against vapor intrusion into structures. LIQUID BOOT® is installed under slab and on below grade vertical walls as a gas vapor barrier to minimize vapor and nuisance water migration into buildings. LIQUID BOOT® spray-application directly to penetrations, footings, grade beams, pile caps and other irregular surfaces, provides for a fully-adhered gas vapor barrier system.

APPLICATIONS

LIQUID BOOT® is used as an underslab and below-grade vertical wall gas vapor barrier, used to minimize vapor and nuisance water (non-hydrostatic conditions) migration into buildings. LIQUID BOOT® is ideal for methane migration control. LIQUID BOOT® is also NSF® certified for use as a potable water liner in concrete water reservoirs and tanks greater than 300,000 gallons to protect the concrete from water seepage.

BENEFITS

- Spray-application provides excellent sealing of penetrations, eliminating the need for mechanical fastening
- Seamless, monolithic membrane eliminates seaming-related membrane failures
- Unique formulation provides superior protection from methane gases and water vapor
- Fully adhered system reduces risk of gas migration
- Protection from methane gas, VOCs, chlorinated solvents and other contaminates

INSTALLATION

Protect all adjacent areas not to receive gas vapor barrier. Ambient temperature shall be within manufacturer's specifications. All plumbing, electrical, mechanical and structural items to be under or passing through the gas vapor barrier shall be secured in their proper positions and appropriately protected prior to membrane application. Gas vapor barrier shall be installed before placement of rein-forcing steel. Expansion joints must be filled with a conventional waterproof expansion joint material. Surface preparation shall be per manufacturer's specification. A minimum thickness of 60 dry mils, unless specified otherwise.

LIMITED WARRANTY

CETCO warrants its products to be free of defects. This warranty only applies when the product is applied by Approved Applicators trained by CETCO. As factors which affect the result obtained from this product, including weather, equipment, construction, workmanship and other variables are all beyond CETCO's control, we warrant only that the material herein conforms to our product specifications. Under this warranty we will replace at no charge any product proved to be defective within 12 months of manufacture, provided it has been applied in accordance with our written directions for uses we recommend as suitable for this product. This warranty is in lieu of any and all other warranties expressed or implied (including any implied warranty of merchantability or fitness for a particular use), and the Manufacturer shall have no further liability of any kind including liability for consequential or incidental damages resulting from any defects or any delays caused by replacement or otherwise. This warranty shall become valid only when the product has been paid for in full.

In addition to superior chemical resistance performance, LIQUID BOOT® spray-application effectively seals penetrations, footings, grade beams and other irregular surfaces that are considered critical vapor intrusion pathways.

EQUIPMENT

- COMPRESSOR: Minimum output of 155–185 cubic feet per minute (CFM)
- PUMPS: For "A" drum, an air-powered piston pump of 4:1 ratio (suggested model: Graco, 4:1 Bulldog). For "B" drum, an air-powered diaphragm pump (0–100 psi)
- HOSES: For "A" drum, ½" wire hose with a solvent resistant core (for diesel cleaning flush), hose rated for 500 psi minimum. For "B" drum, a 3/8" fluid hose rated at only 300 psi may be used.
- SPRAY WAND: Only the spray wand sold by CETCO is approved for the application of LIQUID BOOT®.
- SPRAY TIPS: Replacement tips can be purchased separately from CETCO.

PACKAGING

LIQUID BOOT® is available in the following packaging options:

- 55 Gallon Drum
- 275 Gallon Tote

LIQUID BOOT®

SPRAY-APPLIED GAS VAPOR BARRIER

TESTING DATA

CHEMICAL & PHYSICAL PROPERTIES		
CHEMICAL PROPERTY	TEST METHOD	RESULT
Acid Exposure (10% H_2SO_4 for 90 days)	ASTM D543	Less than 1% weight change
Benzene Diffusion Test	Tested at 43,000 ppm	2.90 x 10^{-11} m^2/day
Chemical Resistance: VOCs, BTEXs (tested at 20,000 ppm)	ASTM D543	Less than 1% weight change
Chromate Exposure (10% Chromium6+ salt for 31 days)	ASTM E96	Less than 1% weight change
Diesel (1000 mg/l), Ethylbenzene (1000 mg/l), Naphthalene (5000 mg/l) and Acetone (500 mg/l) Exposure for 7 days	ASTM D543	Less than 1% weight change; Less than 1% tensile strength change
Hydrogen Sulfide Gas Permeability	ASTM D1434	None Detected
Methane Permeability	**ASTM 1434-82**	**Passed***
Microorganism Resistance	**ASTM D4068-88**	**Passed***
Oil Resistance	**ASTM D543-87**	**Passed***
PCE Diffusion Coefficient	Tested at 120 mg/L	1.32 x 10^{-13} m^2/sec
Radon Permeability	Tested by US Dept. of Energy	Zero permeability to Radon (222Rn)
TCE Diffusion Coefficient	Tested at 524 mg/L	9.07 x 10^{-13} m^2/sec

LIQUID BOOT®

SPRAY-APPLIED GAS VAPOR BARRIER

TESTING DATA

CHEMICAL & PHYSICAL PROPERTIES		
PHYSICAL PROPERTY	TEST METHOD	RESULT
Accelerated Weathering and Ultraviolet Exposure	ASTM D822	No adverse effect after 500 hours
Air Infiltration	ASTM E283-91	0 cfm/sq. ft.
Bonded Seam Strength Tests	ASTM D6392	Passed*
Coefficient of Friction (with geotextile both sides)	ASTM D5321	0.72
Cold Bend Test	ASTM D146	Passed. Ø cracking at –25°F
Dead Load Seam Strength	City of Los Angeles	Passed*
Electric Volume Resistivity	ASTM D257	1.91 x 1010 ohms-cm
Elongation	ASTM D412	1,332% Ø reinforcement, 90% recovery
Elongation w/8 oz. non-woven geotextile both sides	ASTM D751	100% (same as geotextile tested separately)
Environmental Stress-Cracking	ASTM D1693-78	Passed*
Flame Spread	ASTM E108	Class A with top coat (comparable to UL790)
Freeze-Thaw Resistance (100 Cycles)	ASTM A742	Meets criteria. Ø spalling or disbondment
Heat Aging	ASTM D4068-88	Passed*
Hydrostatic Head Resistance	ASTM D751	Tested to 138 feet or 60 psi
Potable Water Containment	ANSI/NSF 61	NSF Certified for tanks >300,000 gal
Puncture Resistance w/8 oz. non-woven geotextile both sides	ASTM D4833	286 lbs. (travel of probe = 0.756 in)
Sodium Sulfate (2% water solution)	ASTM D543, D412, D1434	Less than 1% weight change
Soil Burial	ASTM E154-88	Passed
Tensile Bond Strength to Concrete	ASTM D413	2,556 lbs/ft² uplift force
Tensile Strength	ASTM D412	58 psi without reinforcement
Tensile Strength w/8 oz. non-woven geotextile both sides	ASTM D751	196 psi (same as geotextile tested separately)
Toxicity Test	22 CCR 66696	Passed
Water Penetration Rate	ASTM D2434	$<7.75 \times 10^{-9}$ cm/sec
Water Vapor Permeance	ASTM E96	0.069 perms

North America: 847.851.1800 | 800.527.9948 | www.cetco.com

UPDATED: DECEMBER 2017

FORM: TDS_LIQUID_BOOT_AM_EN_201712_V3

VI-20™ GEOMEMBRANE

HIGH-PERFORMANCE VAPOR INTRUSION BARRIER

DESCRIPTION

VI-20™ is a 7-layer co-extruded geomembrane made using high quality virgin-grade polyethylene and EVOH resins that provide unmatched impact strength as well as superior resistance to VOC vapor transmission. EVOH technology serves as a highly resilient underslab and vertical wall barrier designed to restrict methane, radon and other harmful chemicals. Applications for EVOH originated in the manufacturing of automotive fuel systems to control emissions of hydrocarbons, whose use was mandated by the US EPA and the CA Air Resources Board (CARB) to reduce VOC emissions.

APPLICATION

VI-20™ is a 20-mil, high performance polyethylene-EVOH copolymer geomembrane, specially designed for use as a VOC barrier when used in conjunction with Liquid Boot® spray-applied vapor intrusion membrane to minimize vapor intrusion and nuisance water (non-hydrostatic conditions) migration into buildings. VI-20™ is ideal for applications with chlorinated solvents, BTEX and other PAHs.

BENEFITS

- Polyethylene layers provide excellent chemical resistance and physical properties
- EVOH barrier technology provides superior protection against diffusion of chemicals when compared to typical HDPE geomembranes
- Manufactured at ISO 9001:2008 certified plant

INSTALLATION

For use as a component of the Liquid Boot® Plus system, VI-20™ geomembrane is rolled out on prepared sub-grade, overlapping seams a minimum of six inches (6”). The geomembrane is cut around penetrations so that it lays flat on the sub-grade and tight at all inside corners. A thin (20 mil) tack coat of Liquid Boot® (“A” side without catalyst) is sprayed within the seam overlap. Once the VI-20™ geomembrane is installed, penetrations are then treated with VI-20™ Detailing Fabric prior to installation of the Liquid Boot® spray-applied vapor intrusion membrane and UltraShield™ G-1000 protection course.

EVOH technology provided in VI-20™ geomembrane has been shown to have VOC diffusion coefficients 20 times lower than an 80 mil (2 mm) HDPE geomembrane.

PACKAGING

VI-20™ Geomembrane is available in the following packaging option:

- 10 ft. x 150 ft. (3 m x 45 m) Rolls

VI-20™ GEOMEMBRANE

HIGH-PERFORMANCE VAPOR INTRUSION BARRIER

VI-20™ CHEMICAL & PHYSICAL PROPERTIES		
CHEMICAL PROPERTY	TEST METHOD	RESULT
Benzene Diffusion Coefficient	EPA Method 8260	4.5×10^{-15} m²/s
Ethylbenzene Diffusion Coefficient	EPA Method 8260	4.0×10^{-15} m²/s
m&p-Xylenes Diffusion Coefficient	EPA Method 8260	3.7×10^{-15} m²/s
Methane Permeance	ASTM D1434	$< 1.7 \times 10^{-10}$ m²/d•atm
o-Xylene Diffusion Coefficient	EPA Method 8260	3.7×10^{-15} m²/s
Radon Diffusion Coefficient	SP Test Method	$<0.25 \times 10^{-12}$ m²/s
Toluene Diffusion Coefficient	EPA Method 8260	4.2×10^{-15} m²/s
PHYSICAL PROPERTY	TEST METHOD	RESULT
Membrane Composite Thickness	ASTM D5199	20 mil (0.5 mm)
Impact Resistance	ASTM D1709	2,600 g
Tensile Strength	ASTM E154 Section. 9	58 lbf/in (1.0 N/m)
Water Vapor Transmission	ASTM E154 & E96	0.004 grains/hr-ft² (0.0028 g/hr-m²)
Water Vapor Retarder Classification	ASTM E1745	Class A, B & C

NOTE:
These are typical property values.

North America: 847.851.1800 | 800.527.9948 | www.cetco.com

UPDATED: MAY 2017

FORM: TDS_VI-20_GEOMEMBRANE_AM_EN_201705_V2

LIQUID BOOT®

APPLICATOR TRAINING MANUAL

NOTICE

THIS MANUAL IS FOR TRAINING PURPOSES ONLY

For complete and detailed information, please refer to
the most current set of LIQUID BOOT® specifications.

CETCO®

2870 Forbs Avenue, Hoffman Estates, IL 60192

800.527.9948 http://remediation.cetco.com

TABLE OF CONTENTS

1. PRODUCT DESCRIPTION

Liquid Boot is a two component, spray applied membrane that acts as gas vapor and damp proofing barrier. Both components are water borne and sprayed simultaneously from a dual nozzle spray wand. The system is spray applied at ambient temperatures in a single course and sets almost instantly under most conditions, forming a completely monolithic membrane free of seams. Liquid Boot is non-toxic and odorless. Liquid Boot will bond securely to concrete, plastic, metal and/or wood surfaces, which are clean, and free of voids, curing compounds or releasing agents. At 77°F (25°C) Liquid Boot is capable of stretching 1,300% with more than 90% dimensional recovery. Liquid Boot spray-applied membrane can easily be applied to the most complex structural shapes, such as inside and outside edges, corners, tight radii or compound surfaces. Only minimal clearance is needed for applicators to work. Because Liquid Boot membrane bonds securely to most types of construction materials, no nailing, seaming or special mastics are needed. Liquid Boot is also compatible with related waterproofing materials such as protection board, drain mats and geotextiles. Typical coverage for Liquid Boot is 9-15 square feet (0.8-1.4 square meters) per gallon depending on the required thickness of the membrane and the type of substrate material. A crew of three (3) can spray approximately 7,000 square feet (650 square meters) per eight (8) hour day.

LIQUID BOOT CHARACTERISTICS PRIOR TO SPRAYING	LIQUID BOOT CHARACTERISTICS WHEN APPLIED
Non-flammable	Gas vapor barrier
Non-toxic	Damp-proofing barrier
Odorless	Elastic - stretches 1300% with 90% dimensional recovery
Solvent Free	Seamless – monolithic membrane
Applied at ambient temperatures	Adheres to most construction materials
Water-based	Low modulus – absorbs quickly

ADVANTAGES OF LIQUID BOOT:

- Single course and fast application
- Requires minimum equipment and manpower
- Can be easily transported to remote areas

PRIMARY USES FOR LIQUID BOOT:

- Gas vapor barrier for landfills and other Brownfields
- Waterproof liner for canals, tanks, & reservoirs
- Very cost effective

All applications of Liquid Boot must be designed and/or approved by the appropriate engineers. All applications of Liquid Boot require that the spraying surface be free of dust, dirt, grease, curing compounds and releasing agents.

2. DESCRIPTION OF EQUIPMENT NEEDED

TRUCK SIZE: Trucks used to haul Liquid Boot from storage facilities to the application location should be adequately sized for the load. Each 55-gallon drum weighs approximately 500 U.S. pounds+ (225 kg+).

COMPRESSOR: Spraying Liquid Boot properly requires a compressor with an output of 155-185 cubic feet per minute (CFM). Compressors of smaller volume will cause the spray to be uneven, and adversely affect the membrane.

"A" DRUM PUMP: The "A" drum should be pumped with an air-powered, 4:1 ratio piston pump (suggested model: Graco, Bulldog). Two spray crews can operate from one pump. Connect pump to the "A" drum with 6 feet (1.8m) of ¾" (19mm) feed hose. It is common practice to attach a screen to the 'A' side inlet hose (e.g., a metal frame with 20 x 40 US mesh screen wrapped and zip tied over the frame to reduce large aggregates from entering pumping equipment.

"B" DRUM PUMP: The "B" drum should be pumped with an air-powered, diaphragm pump (0 -100 psi). Connect ¾" (19mm) PVC pipe directly from the pump into the drum.

HOSES: Spraying Liquid Boot requires the use of the following hoses: Drum/pump "A" should be connected to the spray wand with a ½" (12mm), one-wire hose with a solvent resistant core (for diesel cleaning flush), rated for 500 psi minimum. Drum/pump "B" may use a 3/8" fluid hose rated at only 300 psi. It is best to use two different colors of hose for each part of the product, "A" and "B", so that leaks and tangles can be easily traced. Typically, these hoses come in 50 or 100-foot (15m or 30m) lengths. The applicator will most likely find that a 300-foot (90-100m) length will help the job progress most smoothly. Before starting the application, the two hoses should be laid out and taped together to avoid tangles. It is also prudent, but not necessary; to wrap the hoses with plastic to assist in the containment of leaks should one of the hoses fail. Hoses and fittings should be tightened securely and checked each day before application for leaks, replace when necessary. If one pump is being used with two spray wands, it is very important that the hoses for each spray wand are the same length to equalize the pressure in both lines.

NOTE: IF SOLVENTS OTHER THAN DIESEL FUEL, SUCH AS M.E.K., ARE USED TO FLUSH THE "A" LINE, BE SURE THAT THE HOSE CORE HAS THE APPROPRIATE CHEMICAL RESISTANCE BEFORE PROCEEDING.

SPRAY WAND: Only the spray wand sold by CETCO is approved for the application of Liquid Boot. The spray wand has connections for both "A" and "B" product, and valves to control and shut off each. The tips are designed to be at a specific angle and spray size so as to properly catalyze the product before it hits the application surface. Any damage to the spray wand, the tips, or change in angle of the spray will adversely affect the membrane. Use only soft instruments to clear the tips of any blockage so as not to scratch the surface or enlarge the spray opening thus affecting the rate or angle of the spray. Replacement tips can be purchased separately from CETCO. Minimum clearance required for application of product is:

- 90° degree spray wand - 2 feet
- Conventional spray wand - 4 feet

3. ITEMS NEEDED BY LIQUID BOOT APPLICATORS

☐ Stir Sticks:
- 1 - 5' x 1-1/4" dowel (for mixing "A" drum)
- 1 - 5' x 3/4" dowel (for mixing "B" drum)
- 1 - Paint stirrer (for mixing Trowel Grade)

☐ 5 Gallons Diesel Fuel

☐ 2 Empty 5-Gallon Buckets

☐ Clothing/Protection:
- Tyvek suits
- Rubber gloves
- Rubber boots (smooth soles preferable)
- Goggles or face masks and dust masks
- Painter's head sock
- Citrus Hand Cleaner

☐ Assorted Tools:
- Drum wrench
- Ratchet wrench with 15/16" socket to open drums
- Large pipe wrench and crescent wrenches
- Rags
- Set of open end box wrenches
- Teflon plumber's tape
- 1" heavy duty trowel
- 3" putty knife
- Grout bag for Trowel Grade
- Razor knife
- Screw drivers
- Hammer
- Channel locks
- Measuring tape
- Scissors
- Duct tape

☐ Caliper (mil reading) and/or Depth Gauge (blunt nose, mil reading)

☐ 3" or 6" Roll of Hardcast CRT-1602 Reinforcing Tape for joint reinforcement

☐ Extra Stainless Steel Spray Tips - Available from CETCO (800) 552-4236 or Spraying Systems (714) 952-9371
- "A" side: H1/4U-316-SS-6530
- "B" side: H1/4VV-316-SS-6505

☐ Drum Dolly - drums weigh 500 lbs.

4. CREW SIZE

The most efficient crew size for application of Liquid Boot consists of from two to four people. On smaller projects a crew of two people may be sufficient. Larger projects with vast areas of coverage will require three or four people to allow efficient progress.

CREW MEMBERS:
- **SPRAYER** - controls the Spray Wand and the volume and thickness of product being applied.
- **HOSE ATTENDANT** - stationed close to the sprayer and positions the hoses for ease of application.
- **PUMP/DRUM ATTENDANT** - stirs the product before application begins, monitors the pumps to insure their continuous operation, and moves the suction hoses from drum to drum as each is emptied.
- **HELPER** - assists the other three-crew members in whatever needs to be done. Some of this person's duties include insuring that the application surface is smooth and free of debris, securing geotextile that may be loose before the application of Liquid Boot, assisting in the adjustment of the hoses as the spray area moves.

5. SAFETY CONSIDERATIONS

CLOTHING:<u>It is advisable to wear the following protective clothing when applying Liquid Boot.</u>
- DUST MASKS - to prevent inhalation of overspray
- COVERALLS - these may be either cloth, rubber or disposable paper
- GOGGLES or FACE SHIELD
- RUBBER BOOTS and GLOVES
- HARD HAT and PAINTER'S HEAD SOCK
- VASELINE for exposed skin areas

FIRST AID:<u>Liquid Boot is non-toxic, however, please follow the precautions below.</u>
- **EYES** - Liquid Boot in eye tissue should be flushed immediately with clean water. See a doctor for immediately.
- **SWALLOWED** - Any person who swallows Liquid Boot, or its separate parts, should See a doctor for immediately.
- **SKIN CONTACT** - Liquid Boot should not be left on the skin for extended periods of time. Clean any Liquid Boot from the skin at the end of each day with a degreasing cleaning compound or non-penetrating solvent.

6. SPILL & HOSE RUPTURE PREVENTION

Spills and hose ruptures can be avoided with vigilance. All pumps and hoses should be checked daily for wear that may cause rupture or breakdown. Hoses can be wrapped in plastic to aid in the containment of product in the event of a rupture. All pumping operations should only be done on a level surface. Drums of Liquid Boot should be stored on a level surface. Care should be taken while operating any equipment (including equipment of other contractors) near the drums, hoses or pumps. Should a spill occur, the puddles should be allowed to catalyze (spray with "B" Drum Catalyst) and then peeled from the surface. Small spots can be cleaned with diesel fuel or appropriate cleaning solvent.

7. WEATHER CONSIDERATIONS

Poor weather conditions during application will adversely affect the Liquid Boot membrane. The following guidelines should be strictly adhered to:

- Minimum air temperature: **45°f (7°c)**
- **RAIN**: Do not spray. Never spray Liquid Boot in standing water.
- Humidity: May cause longer curing times.
- **FOG**: Ok to spray as long as there is no standing water. Damp surfaces are ok, provided that moisture will eventually evaporate out after membrane application.
- **WIND**: Take precautions not to overspray into unprotected areas particular care should be taken when windy conditions exist during application. Even a small amount of wind can cause overspray to travel a great distance.
- Sufficient ventilation in enclosed spaces is required for safety and proper curing of the membrane.

8. CLEAN UP OF EQUIPMENT

To clean the spray wand, hoses, pumps and other equipment, pump diesel fuel through the lines **("A" side only)**. If solvents other than diesel fuel, such as M.E.K., are used to flush the "A" line, be sure that the hose core has the appropriate chemical resistance before proceeding. The "B" side should be flushed with clear water. **Do not flush "B" side hoses with diesel fuel.**

If the equipment is to be used the next day, it is not required to flush out the hoses; however, all hoses must be blocked or plugged so as not to allow air into the lines which would allow the product to catalyze, thus clogging the line. Spray Wands and pumps should be cleaned every day to insure proper operation. Spray tips will last longer and will be easier to clean if they are soaked in solvent between uses. Sometimes foreign matter will clog the line or the spray tips during application. Should this occur, the spray tips should be removed and the line momentarily "blown out" in an area that will not be damaged.

NOTE: DISPOSAL OF DIRTY DIESEL FUEL AND EMPTY MATERIAL DRUMS SHOULD BE DONE IN ACCORDANCE WITH ALL LOCAL GOVERNMENTAL REQUIREMENTS.

9. PREPARING LIQUID BOOT FOR APPLICATION

Liquid Boot requires thorough stirring before each use. Failure to prepare the product properly will adversely affect the membrane and/or cause equipment to clog and breakdown.

"A" DRUM: Remove lid from "A" drum. If any crust of catalyzed material exists floating on the surface of the product, it should be removed and discarded. Stir the product with a clean, dry wooden or steel instrument that reaches all the way to the bottom of the drum (60"/1.5m minimum). Stir the product a **MINIMUM OF 20 REVOLUTIONS** or until the product is blended to a uniform chocolate color. The product should be stirred as close to time of application as possible. Only stir the first drum to be used at the beginning of the application. Each successive drum should be stirred immediately before the transfer of the suction hose.

"B" DRUM: Remove bung cap from "B" drum. Stir the product with a clean, dry wooden or steel instrument that reaches all the way to the bottom of the drum (60"/1.5m minimum). **DO NOT USE THE SAME INSTRUMENT THAT WAS USED FOR THE "A" DRUM**. Stir the product a **MINIMUM OF 20 REVOLUTIONS** or until the product is blended to a uniform chocolate color. The product should be stirred as close to time of application as possible. **Stir the product every 30 minutes during the application of Liquid Boot**. Only stir the first drum to be used at the beginning of the application. Each successive drum should be stirred immediately before the transfer of the suction hose.

NOTE: DO NOT USE ANY LIQUID BOOT PRODUCTS BEYOND THE EXPIRATION DATE SHOWN ON THE DRUM LABELS.

10. PUMPS & PRESSURE

Every job will require slightly different equipment configurations. One job may be on a flat site and only require 100 feet of hose, while the next job the pumps are 30 feet below the spraying surface and 300 feet of hose is required, while the next job you are running two spray wands off the same pump with 200 feet of hose each. All of these configurations will require different pump pressure settings to overcome pressure losses due to line surface friction in the hoses and gravitational pressure.

If you are using a 4 to 1 pump, a good starting point for the "A" side is 65 psi. Test the spray at 65 psi and make sure that the spray is developing the full 65° wide fan pattern without thickened edges. Adjust the pressure up or down to the point where the fan develops a full even spray across the entire width.

A good starting point for the "B" side is 50 psi. Test the spray at 50 psi and make sure that the spray is developing the full 65° wide fan pattern without thickened edges. The "B" side is easier to calibrate by spraying at the same time as the "A" side. The two fans should cross evenly, and the product should be catalyzing completely on the application surface. Adjust the pressure up or down to the point where the fan develops a full even spray across the entire width. Check the amount of catalyst used after 4 drums of "A" have been sprayed. After 4 drums of "A", there should be half a drum of "B" remaining. If there is less than a half a drum of "B", turn down the pressure to the "B" pump. If there is more than half a drum of "B" remaining and the product is setting up fine without any flow, leave the setting as is. You will often get greater than 8 "A" to 1 "B" when the substrate is hot, the air temperature is warm, and the humidity is low. Equal hose lengths should be used when running two spray wands off the same pump in order to equalize the pressure in both lines.

11. SURFACE PREPARATION

Liquid Boot will not adhere to the application surface unless the surface is **FREE OF ALL DUST, DIRT, GREASE, CURING COMPOUNDS AND RELEASING AGENTS**. If a contractor other than the applicator is preparing the site for Liquid Boot application, the site should be inspected the day before to insure that the proper surface is ready. **DO NOT SPRAY IF THE APPLICATION SURFACE IS NOT PROPERLY PREPARED**. All voids deeper than ¼" (6mm) must be filled prior to application. If spraying on dirt, all rocks larger than ¼" (6mm) must be removed. Aggregate sub-bases shall be rolled flat. If base geotextile/geomembrane is used, it should be tight and without wrinkles. See also Sections 13, 14, 15 and 16 of this manual for further information.

INSIDE CORNERS OF 120° OR LESS: When the application calls for inside corners of 120° or less to be sealed, a ¾" (2 cm) minimum cant of Liquid Boot must be applied to ease the transition and allow to cure overnight before the application of Liquid Boot. A grout bag may be used to speed up the application of Liquid Boot Trowel Grade.

PENETRATIONS: When the application area is to be penetrated, the procedures listed below should be used before application to insure that the product will adhere to the materials listed below. In all cases, an area should be tested to be sure of proper adherence. See also Section 16: Sealing around Penetrations.

- ABS and PVC PIPE - Roughen with sand paper to remove factory finish.
- CAST IRON, GALVANIZED, ALUMINUM, & COPPER PIPE - Remove factory oils with mild solvents. Roughen with emery cloth.
- STEEL - Remove all rust from the surface. See also "Reinforcing Steel" below.
- WOOD - Wood surfaces should be clean, dry and free of all oils.

REINFORCING STEEL: Particular care should be taken when working around reinforcing steel. Structural reinforcing steel already in place before the application of Liquid Boot should be masked and protected prior to the application to insure that the steel surface remains free of the product. If the point of reinforcing steel penetration is to be sealed, then just that portion of the bar should be left unmasked. Remove any rust from the bar to insure proper adherence of Liquid Boot.

CONCRETE/SHOTCRETE/MASONRY: Concrete surfaces shall be light broom finish or smoother, and free of any dirt, debris, loose material, release agents or curing compounds. Fill all voids more than ¼" (6mm) deep and/or ¼" (6mm) wide. Reinforce concrete cracks and cold joints up to 1/8" wide with 3" (8cm) wide reinforcing tape (Hardcast CRT 1602) over the joint. **Cracks and cold joints greater than 1/16" wide must be filled with a solvent free caulking, or expansion joint material, which is designed to support the expected head pressure, and expansion parameters**. Masonry joints shall be struck smooth and flush with block face. All penetrations shall be prepared in accordance with manufacturer's specifications. See also Section 16: Sealing around Penetrations. For joints and cracks over 1/8" wide contact CETCO for project specific instructions.

SEALERS AND CURING COMPOUNDS: Inform the contractor **BEFORE** the concrete is poured that Liquid Boot will not adhere to the surface if any release agents, curing compounds or form oil is used on the application surface. If these materials exist, acid etch or sand blast the surface and allow it to dry before application of Liquid Boot. As an alternate to acid etching, geotextile/geomembrane may be used on the concrete surface if the membrane is does not require a direct mechanical connection to the surface (i.e. between slab membranes). See Section 13: Spraying on Concrete/Shotcrete/Masonry and Section 15: Spraying Tanks (Steel and/or Concrete).

DIRT: The sub-grade shall be moisture conditioned and compacted to a minimum relative compaction of 90 percent or as specified by civil/geotechnical engineer. The finished surface shall be smooth, uniform, and free of debris and standing water. Remove all stones or dirt-clods greater than ¼" (6mm). Final sub-grade preparation shall not precede the membrane application by more than 72 hours. If required, spray-apply colored soil sterilant at the manufacturer's recommended rate. All penetrations shall be prepared in accordance with manufacturer's specifications. All form stakes that penetrate the membrane shall be of reinforcing steel and detailed as a penetration, which shall be bent over and left in the slab. Trenches shall be cut oversize to accommodate gas vapor membrane and protection course with perpendicular to sloped sides and maximum obtainable compaction. Adjoining grade shall be finish graded and compacted. Excavated walls shall be vertical to sloped back free of roots and protruding rocks. Specific sub-grade preparation shall be designed by a qualified civil or geotechnical engineer. See Section 13: Spraying on Earth.

STEEL: Remove all rust and loose material from the surface (brush blast). See Section 15: Spraying Tanks (Steel and/or Concrete).

MASKING AND OVERSPRAY PROTECTION: Mask off all areas not to be sprayed with Liquid Boot. Care should also be taken to insure that general overspray does not spread into unmasked areas. Particular care should be taken when windy conditions exist during application. Even light wind can cause overspray to travel a great distance. Remove masking as soon as spraying is complete. Before you spray, determine if the site requires inspection by government authorities or other inspectors.

12. SPRAYING LIQUID BOOT®

Consistent and accurate spraying technique is important in order to have a good membrane. Each applicator should use a spray wand of proper length so that proper spraying techniques can be accomplished with a natural, fluid motion. The instructions below should be followed closely:

- **The tip of the spray wand must be between 18 to 24 inches (45 – 60cm) from the application surface at all times**. If the wand is too close, the product will not catalyze properly and the membrane may develop pockets of white latex rubber. If the wand is too far from the application surface, the product will catalyze too soon, causing an uneven, stippled surface. A longer or shorter spray wand may help to insure the proper distance from the surface is maintained at all times.

- Open the valves of the Spray Wand completely. The tips of the Spray Wand control the amount of material to be sprayed in the correct ratio. No adjustment of the valves is necessary. Partially closed valves may cause turbulence in the line, which will cause the product to break prematurely and clog the line and/or the spray tip. Clear lines of any diesel and water before starting to spray surface.

- The applicator should develop a natural fluid motion with a consistent arch of spray that is about twice the width of the body (about 4-5 feet, 1 -1.5m) while keeping the spray tips at a constant 90 to the surface. The area in front of the applicator should be sprayed first, and then when the desired thickness is attained, the applicator should move backwards being sure that the minimum membrane thickness is maintained in all areas. Swinging the spray wand in a pendulum motion will create shadows and voids resulting in leaks. Shadowing also occurs when the spray wand is not held at 90° to the surface being sprayed.

- The applicator must be supplied with constant and consistent pressure from the pumps. Any inconsistency of pressure and flow will cause the product to improperly catalyze and adversely affect the membrane.

- Liquid Boot shrinks in thickness as it cures. The applicator should be sure to apply an adequate thickness of the product to insure that when cured it still has the mil thickness required by the specification. Typical mil thicknesses are listed below. The appropriate engineer should determine the thickness required for specific applications.

	MIL THICKNESS – DRY	MIL THICKNESS – WET
Note: 1 mil = .001" = .0254 mm	60 mils	100 mils
	80 mils	135 mils
	100 mils	170 mils

- Liquid Boot coverage. Yields are based on single layer, controlled flat areas with minimal overspray. Contractors should apply a reduction factor to account for overlap and waste when installing Liquid Boot membrane. Due to varying job conditions and skill level of the spray person, CETCO Remediation Technologies does not guarantee material yields.

	MIL THICKNESS – DRY	COVERAGE AREA
Liquid Boot® - 55 gal drum	60 mils	825 ft^2
	80 mils	620 ft^2
	100 mils	500 ft^2

- Seams in the geotextile/geomembrane layer should be sprayed carefully to insure that the seams have a full and complete bond. The upper layer of geotextile/geomembrane should be pulled back and Liquid Boot sprayed a minimum of 6" (15cm) wide on the lower layer. The upper layer is then pressed back into the wet membrane. As Liquid Boot is applied over the seams, the applicator should momentarily hold down any irregularities or wrinkles in the geotextile/geomembrane with a foot. Then the area should be re-coated to insure it is of the required thickness and that the seams are adequately sealed.

- Lap Joints over previously applied membrane shall be a minimum of 6" (15cm) in width.

- **Important!!** Sweep off any ponding water that has ejected during the curing process before leaving the job site. Failure to do so will result in an improper membrane cure.

- If a water flood test is to be performed, allow the membrane to cure at least 72 hours. Do not place any protection course or other materials on the membrane until the membrane has passed the water test.

- **Do not attempt to apply a second coat until all the water has ejected from the previous coat**. Spraying a second coat over a previous coat still ejecting water will result in trapped water and lack of adhesion between the two coats.

13. SPRAYING ON EARTH

If a contractor other than the applicator is preparing the site for Liquid Boot application, the site should be inspected the day before to insure that the proper surface is ready. **DO NOT SPRAY IF THE APPLICATION SURFACE IS NOT PROPERLY PREPARED**.

a. Roll out geotextile on sub grade with the heat-rolled side facing up and/or geomembrane with any side up. Overlap seams at least 6" (15cm). Lay geotextile/geomembrane tight at all inside corners. Spray Liquid Boot within the seam overlap to a thickness of 20 dry mils minimum.

b. Line trenches with geotextile/geomembrane extending at least 6" (15cm) onto adjoining sub-grade if slab and footings are to be sprayed separately. Overlap seams at least 6" (15cm). Lay geotextile/geomembrane tight at all inside corners. Spray Liquid Boot within the seam overlap to a thickness of 20 dry mils minimum.

c. NOTE: Geotextile shall be non-woven polypropylene or polyester fabric, 4 oz./yd^2, unless otherwise specified. At least one side shall be heat-rolled. The heat-rolled side shall be used as the application surface. Geomembrane shall be 7 layer coextruded EVOH geomembrane.

d. Refer to Section 15 for procedures on sealing around penetrations.

e. Spray-apply Liquid Boot onto geotextile/geomembrane to 60 mil dry thickness or as specified. Increase thickness to 100 dry mils if shotcrete is to be applied directly to membrane. If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

f. **Do not penetrate membrane.** Keep membrane free of dirt and debris and traffic until a protective cover is in place. It is the responsibility of the General Contractor to insure that the membrane and the protection system are not penetrated.

g. After the membrane has cured and checked for proper thickness and flaws, install protection material pursuant to the manufacturer's instructions.

NOTE: IF INSPECTION IS TO BE PERFORMED, CONDUCT BEFORE PLACING PROTECTION COURSE. LIQUID BOOT APPLICATIONS ON VERTICAL AND SLOPED SURFACES NEED TO BE DESIGNED BY A QUALIFIED ENGINEER. BEFORE YOU SPRAY, DETERMINE IF THE SITE REQUIRES INSPECTION BY GOVERNMENT.

14. SPRAYING ON CONCRETE/SHOTCRETE/MASONRY

a. Refer to Section 15 for procedures on sealing around penetrations.

b. Provide a ¾" minimum cant of Liquid Boot or other suitable material as approved by CETCO at all horizontal to vertical transitions and other inside corners of 120° or less. Allow to cure **OVERNIGHT** before the application of Liquid Boot.

c. Delineate a test area **ONSITE** with a minimum dimension of 10 feet by 10 feet (3m by 3m). Apply Liquid Boot to a thickness of 60 mils and let it cure for **24 HOURS**. Observe for blisters. If minor or no blistering occurs, proceed to the next step. (See note regarding blisters). If significant blistering does occur, apply a thin (10 mil) tack coat of Liquid Boot "A" side, without catalyst, to the entire concrete surface and allow to cure before proceeding. (See also info on blister repair).

d. Spray-apply Liquid Boot to an 60 mil minimum dry thickness. Increase thickness to 100 dry mils if shotcrete is to be applied directly to membrane. If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

e. **DO NOT PENETRATE MEMBRANE**. Keep membrane free of dirt and debris and traffic until a protective cover is in place. It is the responsibility of the General Contractor to insure that the membrane and the protection system are not penetrated.

f. After membrane has cured and is checked for proper thickness and flaws, install protection material pursuant to manufacturer's instructions. If water testing or inspection is to be performed, conduct before placing protection course.

g. **NON-HORIZONTAL SURFACES**: Spray on non-horizontal surfaces should begin at the bottom and work towards the top. This method allows the product to adhere to the surface before hitting catalyst runoff.

Due to the nature of concrete as a substrate, it is normal for some blistering to occur. This is caused by either concrete's tendency to off-gas or water that is temporarily trapped between the concrete and the membrane. With time and the applied pressure of backfill or over-slab, blisters will absorb into the concrete without detriment to the membrane. A small number of blister heads should be sampled and checked for proper membrane thickness. If the samples have the required membrane thickness (60 mils minimum) then **the remaining blisters should not be punctured or cut**. If the samples have less than the minimum 60 mils, then the area can either be resprayed to obtain proper thickness, or blisters can be cut out and the area resprayed or patched with Liquid Boot Trowel Grade. Before you spray determine if the site requires inspection by government authorities or other inspectors.

15. SPRAYING STEEL OR CONCRETE TANKS

In some instances an empty tank will expand after being filled which may cause small cracks to become large cracks resulting in membrane failure. Before starting the job, inquire if any tank or crack expansion is expected. If yes, determine if the owner or design engineer has taken appropriate steps to mitigate this condition. Liquid Boot Trowel Grade is not a caulking or expansion joint material. Cracks and cold joints must be reinforced with Hardcast CRT 1602 reinforcing tape. Cracks greater than 1/8" wide must be filled with a solvent free caulking or expansion joint material designed to support the expected head pressure and expansion parameters, then reinforced with Hardcast CRT 1602 reinforcing tape. Before spraying, determine if the site requires inspection by government authorities or other inspectors.

a. Refer to Section 16 for procedures to seal around penetrations.

b. Provide a 3/4" minimum cant of Liquid Boot at all horizontal to vertical transitions and inside corners of 120^0 or less. Allow to cure **overnight** before the application of Liquid Boot.

c. All cracks must be filled with a material designed to support the expected head pressure.

d. **WALLS & CEILINGS**: Spray-apply a thin (10 mil) tack coat of Liquid Boot "A" side only (no catalyst). Let it cure until tacky. Then spray-apply Liquid Boot to an 60 mil dry thickness. Increase thickness to 100 dry mils if shotcrete is to be applied directly to membrane. Spray on non-horizontal surfaces should work from bottom to top. Walls and ceilings should be completed and cured a minimum of 24 hours and all residual water removed prior to commencing application on floors.

e. **FLOORS**: Spray-apply a thin (10 mil) tack coat of Liquid Boot "A" side only (no catalyst). Let it cure until tacky. Then spray-apply Liquid Boot to an 60-mil minimum dry thickness. Increase thickness to 100 dry mils if shotcrete is to be applied directly to membrane.

f. Remove all residual moisture from the floor before leaving site and continue to ventilate for a minimum of 72 hours following the application to allow the membrane to cure completely.

g. At all inlet and outlet locations the membrane must be protected from splashing or turbulent water. Install appropriate protection as designed by the project engineer.

h. Do not penetrate membrane. Keep membrane free of dirt and debris and traffic until a protective cover is in place. It is the responsibility of the General Contractor to insure that the membrane and the protection system are not penetrated.

NOTE: TOO HIGH OF INLET PRESSURE CAN CAUSE DAMAGE TO THE MEMBRANE DURING REFILLING. ACCORDINGLY, INFORM THE TANK OWNER TO TAKE CARE NOT TO DAMAGE THE MEMBRANE DURING REFILLING.

16. SEALING AROUND PENETRATIONS

Great care should be taken to insure penetrations are sealed properly. The following steps are required when sealing penetrations:

a. Clean and etch penetrations as required in Section 11: Surface Preparation.

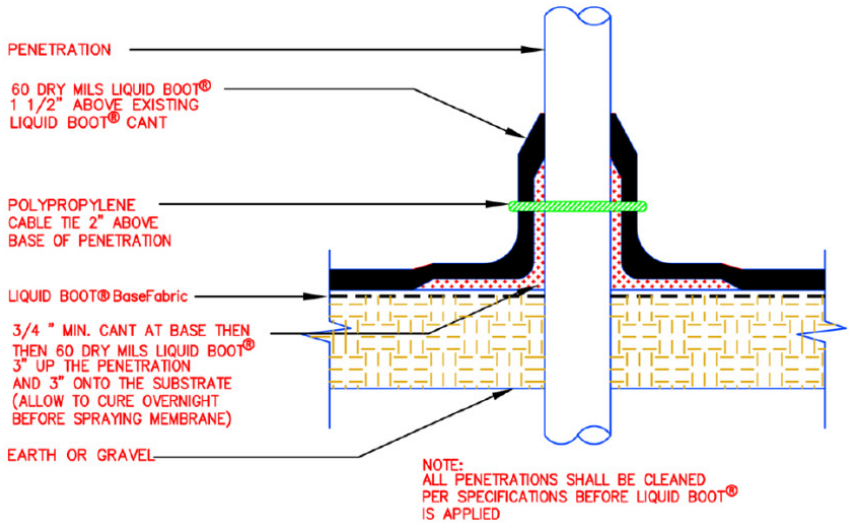
b. For applications requiring geomembrane roll out geomembrane on sub-grade with any side up. For geotextile, roll out geotextile on sub-grade with the heat-rolled side facing up, overlapping all seams a minimum of six inches (6”). Cut the geotextile/geomembrane around penetrations so that it lays flat on the sub-grade. Lay geotextile/geomembrane tight at all inside corners. Spray Liquid Boot within the seam overlap to a thickness of 20 dry mils minimum.

c. At the base of penetration install a minimum 3/4 inch thick membrane cant of Liquid Boot, or other suitable material as approved by manufacturer. Extend the membrane at an 60 dry mil thickness three inches (3”) around the base of penetration and up the penetration a minimum of three inches (3”). Allow to cure **overnight** before the application of Liquid Boot membrane. **(SEE DETAIL BELOW)**

d. Spray apply Liquid Boot to an 60 mils minimum dry thickness around the penetration, completely encapsulating the collar assembly and to a height of one and one half inches (1 ½”) minimum above the membrane as described in C above. Spray-apply Liquid Boot to surrounding areas as specified for the particular application. **(SEE DETAIL BELOW)**

e. **Allow Liquid Boot tocure completely before proceeding to step “F”**.

f. Wrap penetration with polypropylene cable tie at a point two inches (2”) above the base of the penetration. Tighten the cable tie firmly so as to squeeze the cured membrane collar.



17. CURING TIME OF LIQUID BOOT®

Under optimum conditions (See "Weather Considerations") Liquid Boot cures to nearly 90% of its ultimate capacity within minutes of hitting the application surface and full capacity within 96 hours after it is applied. The membrane must be cured at least overnight before inspecting for dry-thickness, holes, shadow shrinkage, and any other membrane damage. If water testing is to be performed, allow the membrane to cure at least 72 hours prior to the water test. Humidity and ventilation can greatly affect the curing time of Liquid Boot. Be sure that humidity is as low as possible and that there is a maximum amount of ventilation. If these parameters are not possible to obtain, the product will take longer to cure.

18. FIELD QUALITY CONTROL

Field quality control is a very important part of all Liquid Boot applications. Applicators should check their own work for coverage, thickness, and all around good workmanship **BEFORE** calling for inspections. Applicators and Inspectors should check membrane for holes, shadow shrinkage, and any other membrane damage when reviewing the membrane. When thickness or integrity is in question the membrane should be tested in the proper manner as described below. However, over-sampling defeats the intent of inspections. Inspectors should always use visual and tactile measurement to guide them. Areas suspected of being too thin to the touch should be measured with the gauges to determine the exact thickness. With practice and by comparing tactile measurements with those of the gauges, fingers become very accurate tools.

ON CONCRETE/SHOTCRETE/MASONRY AND OTHER HARD SURFACES:

a. Check the membrane for proper thickness with a blunt-nose depth gauge. Record the minimum reading. Mark the test area for repair, if necessary.

b. If necessary, test areas are to be patched over with Liquid Boot to a 60 mils minimum dry thickness, extending a minimum of one inch (1") beyond the test perimeter.

Due to the nature of concrete as a substrate, it is normal for some blistering to occur. This is caused by either concrete's tendency to off-gas or by water temporarily trapped between the concrete and the membrane. With time and the applied pressure of backfill or overslab, blisters will absorb into the concrete without detriment to the membrane. A small number of blister heads should be sampled and checked for proper membrane thickness. If the samples have the required thickness (60 mils minimum) then **the remaining blisters should not be punctured or cut**. If the samples have less than the minimum 60 mils, then the area can either be resprayed to obtain proper thickness, or blisters can be cut out and the area resprayed or patched with Liquid Boot Trowel Grade.

NOTE: SEE INFORMATION REGARDING BLISTERS ON CONCRETE IN SECTION 20.

ON DIRT AND OTHER SOFT SUBSTRATE:

a. Samples may be cut from the membrane and geotextile/geomembrane sandwich to a maximum area of 2 square inches. Measure the thickness with a mil-reading caliper. Deduct the plain geotextile/geomembrane thickness to determine the thickness of Liquid Boot membrane. Mark the test area for repair.

b. Voids left by sampling are to be patched with geotextile overlapping the void by a minimum of two inches (2”). Apply a thin tack coat of Liquid Boot under the geotextile patch. Then spray or trowel-apply Liquid Boot to a 60 mils minimum dry thickness, extending at least three inches (3”) beyond geotextile patch.

19. LIQUID BOOT TROWEL GRADE

CETCO also produces Liquid Boot Trowel Grade for repairing, patching, applying membrane in hard-to-get areas and sealing around penetrations. Liquid Boot Trowel Grade provides the same membrane as standard Liquid Boot, but is thicker so that it can be applied with a trowel. Liquid Boot Trowel Grade comes in one-gallon buckets. Liquid Boot Trowel Grade is not a caulking or expansion joint material. Cracks and cold joints up to 1/8” wide may be **COMPLETELY FILLED** with Liquid Boot Trowel Grade then reinforced with 3” (8 cm) wide Hardcast CRT 1602 reinforcing tape. Cracks greater than 1/8” wide must be filled with a solvent free caulking or expansion joint material designed to support the expected head pressure and expansion parameters.

MIXING INSTRUCTIONS:

a. Remove the lid. Peel off and discard any crust that may have formed on the top surface.

b. If the material is not pliant and liquid it may not be used, and must be discarded. If material is to be stored for long periods, it should be mixed every 30 days. Do not use material beyond the expiration date shown on the container.

c. Stir the material with a clean stick until entire contents have attained a uniform dark chocolate color. **MAKE SURE THE MATERIAL IS COOL TO AT LEAST 75° BEFORE ADDING CATALYST**.

d. Take the attached bottle of Liquid Boot Trowel Grade Catalyst and shake it well. **Pour the ENTIRE AMOUNT of catalyst, including all solids, into the bucket while stirring the contents slowly.**

e. Mix until all contents have achieved a smooth buttery consistency and all the free liquid has been absorbed

f. **LIQUID BOOT TROWEL GRADE MAY NOT BE APPLIED AT TEMPERATURES LESS THAN 50°F (10°C)**. Liquid Boot Trowel Grade will remain workable for 20-30 minutes, depending on weather conditions. Do not mix until you are ready to use. Application surfaces must be clean, dry and free of all release agents and curing compounds. **DO NOT OVER-STIR OR RE-STIR THE MATERIAL** after the initial mixing of the product. It is normal for some water to form on the top of the material.

g. Liquid Boot Trowel Grade will set in approximately 24 hours, and will completely cure in 3-4 days with warm, dry weather. Drying time will be slower in cool, damp weather. Allow to dry between coats! Use forced air if necessary. **COATING BECOMES A VAPOR AND DAMPPROOF BARRIER ONLY AFTER DRYING THOROUGHLY! DO NOT SPRAY LIQUID BOOT OVER TROWEL GRADE UNTIL TROWEL GRADE HAS CURED A MINIMUM OF 24 HOURS**.

h. Clean up tools using a grease cutting solvent.

i. Discard buckets and unused material in accordance with all local governmental requirements.

WARNING: LIQUID BOOT TROWEL GRADE AND LIQUID BOOT TROWEL GRADE CATALYST ARE NOT INTERCHANGEABLE WITH LIQUID BOOT SPRAY APPLIED PRODUCTS. MIXING THE TWO WILL RESULT IN UNWANTED EFFECTS.

20. TROUBLE SHOOTING

BLISTERS ON CONCRETE: Due to the nature of concrete as a substrate, it is normal for some blistering to occur. This is caused by either concrete's tendency to off-gas when sealed, or water that is temporarily trapped between the concrete and the membrane. With time and the applied pressure of backfill or over-slab, blisters will absorb into the concrete without detriment to the membrane. A small number of blister heads should be sampled and checked for proper membrane thickness. If the samples have the required membrane thickness (60 dry mils minimum/100 dry mils minimum if shotcrete) **then the remaining blisters should not be punctured or cut**. If the samples have less than the minimum 60 dry mils/100 dry mils minimum if shotcrete, then the area can either be re-sprayed to obtain the proper thickness or the blisters can be cut out and the area re-sprayed or patched with Liquid Boot Trowel Grade.

PINHOLES: Occasionally small pinholes will appear in the membrane. If the area is not too large, spray a light coat of "A" side only, allowing it to run and fill the holes. Then fog the area with "B" catalyst so that it will set up. For larger areas, completely respray another layer of Liquid Boot. One cause of this problem is the use of geotextiles that have not been heat-rolled. Non-heat-rolled geotextiles can be fuzzy and Liquid Boot will collect on the tips of the fuzz and create blobs, which cause spray-shadows behind them. Small pebbles can also cause small spray-shadows.

CLOGS IN THE LINES, PUMP OR SPRAY WANDS: Sometimes foreign matter will clog the line or spray tips during application. If this occurs, the spray tips should be removed and the line momentarily "blown out" in an area that will not be damaged. Use only soft instruments to clear the tips of blockages so as not to scratch the inside surface or enlarge the spray opening thus affecting the rate or angle of the spray. It is common practice to attach a screen to the 'A' side inlet hose (e.g., a metal frame with 20 x 40 US mesh screen wrapped and zip tied over the frame to reduce large aggregates from entering pumping equipment. Be sure to stir the product thoroughly before each application, and open the Spray Wand valves completely during application.

LATEX RUBBER POCKETS: If white latex rubber pockets form in the membrane, one of the following has occurred and needs to be corrected before proceeding. Latex rubber pockets should be cut out and patched. See **PATCHING OF HOLES**.

- **SPRAY WAND IS HELD TOO CLOSE TO THE APPLICATION SURFACE**: Hold the spray wand so the spray tip is 18-24" (45-60cm) from the application surface and/or use a shorter spray wand.
- **NOT ENOUGH "B" MATERIAL**: Make sure that the valves of the spray wand are open completely and the spray is developing the full 65° wide fan pattern without thickened edge. Make sure the material is adequately stirred. See Section 9: PREPARING THE PRODUCT FOR APPLICATION and Section 12: SPRAYING LIQUID BOOT.
- **BENT SPRAY WAND OR IMPROPER SPRAY TIP SIZE**: The entire spray system should be checked each day before application for proper set up and damages. See Section 2: DESCRIPTION OF EQUIPMENT NEEDED.

SEALERS AND CURING COMPOUNDS: Inform the contractor **BEFORE** the concrete is poured that Liquid Boot will not adhere to the surface if any release agents, curing compounds or form oil is used on the application surface. If these materials exist, acid etch or sand blast the surface and allow it to dry before application of Liquid Boot. As an alternate to acid etching, geotextile may be used on the concrete surface if the membrane does not require a direct mechanical connection to the surface (i.e. between slab membranes). See Section 14: Spraying on Concrete.

UNEVEN OR STIPPLED SURFACE: If the wand is too far from application surfaces the product will catalyze too soon and cause un-even, stippled, surfaces. A longer or shorter spray wand may help insure proper distance from the surface is maintained at all times.

IF MEMBRANE DOES NOT SET UP: One of the following has occurred and needs to be corrected before proceeding:

- **VENTILATE** enclosed areas such as tanks a minimum of 72 hours so that the membrane cures completely.
- **HUMIDITY** will not affect the integrity of the membrane, but will increase cure time. Increase ventilation if possible.
- **PROPER STIRRING OF THE "A" OR "B" DRUMS** is required immediately before application.
- **WATER PONDED ON THE MEMBRANE BEFORE IT CURED COMPLETELY**: Remove all ponding water from the membrane during the initial curing period.

MEMBRANE WON'T STICK TO THE APPLICATION SURFACE: If the membrane will not stick to the application surface, one of the following has occurred and needs to be corrected before proceeding:

- **SURFACE IS NOT CLEAN**: The application surface must be clear of all dirt, dust, sealers, curing compounds, releasing agents, etc. Clean the surface thoroughly before proceeding. See Section 8, "Surface Preparation" for specific site and material cleaning procedures.
- **SURFACE IS TOO WET**: Liquid Boot cannot be sprayed in running water.

- **"B" SIDE CATALYST ON THE SURFACE BEFORE "A" SIDE PRODUCT**: Always spray with the "A" side leading the "B" side. Liquid Boot may not stick to surfaces that have catalyst on them first. If this should occur, allow the catalyst to dry before proceeding. On concrete, apply an "A" side Tack Coat first then spray using the standard procedures. See Section 13: Spraying on Concrete.

PATCHING OF HOLES: If damage occurs to the membrane, cut out the area with a sharp knife and recoat with Liquid Boot or Liquid Boot Trowel Grade. If the original membrane contains geotextile, first spray a tack coat over the area of repair. Then, while tack coat is still wet, apply a geotextile patch that is 2" (5 cm) larger than the area to be repaired, then respray the membrane to a minimum of 80 mils dry thickness extending at least 3" (8 cm) beyond the geotextile patch.

21. SMOKE TESTING

Coupon samples shall be taken every 500-2,500 ft2 to verify thickness of the membrane. Due to variability in size of projects, the Engineer shall determine the frequency of mil thickness sampling. Readings shall be recorded on the Coupon Sampling and Smoke Testing Log by qualified inspector.

All Gas Vapor Membranes shall be Smoke Tested in accordance with the following protocol to receive CETCO material warranty:

1. The gas membrane shall be visually inspected. Any apparent deficiencies and/or installation problems shall be corrected prior to Smoke Testing.

2. Smoke Testing of the LIQUID BOOT® membrane to be conducted by Approved LIQUID BOOT® Applicator and observed by qualified inspector as designated.

3. The date, time, testing reference area, temperature, wind speed/direction, and cloud cover shall be recorded on the Smoke Testing Record. The ambient air temperature at the time of testing should be in excess of 45° F and the wind speed at ground level should be 15 mph or less. (Note: visual identification of leaks becomes more difficult with increasing wind speed.)

4. Delineate a smoke testing area of 2,000-5,000 ft2 (maximum). Assemble and situate smoke testing system to inject smoke beneath membrane. Only inert, non-toxic smoke is to be utilized for membrane Smoke Test.

5. Designate testing control areas by cutting openings in an "X" pattern (min. 4" X 4") in the membrane at selected locations. Mark testing control areas for identification prior to conducting the smoke test.

6. Activate smoke generator / blower system (nominal 150-950 cfm). Apply sufficient pressure as to ensure that smoke will permeate the designated testing area. For verification, ensure that smoke is leaking through testing control areas.

7. Pump smoke beneath the membrane (Min. 1-2 minutes). Observe for leaks in the membrane. Reduce pressure / flow rate if excessive lifting of the membrane occurs.

8. Thoroughly inspect entire membrane surface within area delineated for testing. Use marking device as approved by CETCO to mark / label any leak locations. Mark / label leak locations on floor plan and corresponding testing reference area.

9. Repair leak locations marked in Step #7 by spraying LIQUID BOOT® or by using LIQUID BOOT® trowel grade.

10. Repeat step #'s 7 and 8, as necessary to confirm integrity of the membrane.

11. Once the membrane has passed the smoke test inspection, the successful completion should be documented and signed off by a qualified inspector as delineated by the Engineer, General Contractor, or Owner.

FOR MORE INFORMATION AND TYPICAL DETAIL DRAWINGS, PLEASE VISIT HTTP://REMEDIATION.CETCO.COM

DAILY APPLICATOR QUALITY CONTROL CHECKLIST

FOR LIQUID BOOT® GAS VAPOR BARRIERS

JOB	
TEMP	
DATE	

✓	
	Ensure surface preparation checklist is completed before spraying
	Ensure applicator has sufficient material to complete days' work
	Ensure applicators equipment is working properly
	Review Liquid Boot Training Manual before start of job
	Do a test section 10ft x 10ft to observe for blistering (Concrete only)
	Protect all areas not to be sprayed
	Insure all penetrations are sealed according to Liquid Boot Training Manual
	During application, frequently check thickness using tactile measurements
	After application, sweep, or wet vacuum, off ponding catalyst on all horizontal surfaces
	QC overall thickness of membrane
	QC for pinholes
	QC blisters for proper thickness
	QC for shrinkage and stippled areas
	QC all penetrations
	QC all vertical to horizontal transitions
	Call for inspection

MATERIAL USAGE CHECK * Maximum 800 & 825 sq. feet per "A" drum, for an 60 mil dry membrane	TOTAL Square Footage Sprayed		SQ. FT.
	Divided by Number of Drums Used		DRUMS
	***Equals Square Feet Per Drum**		

REMARKS:	
SIGNATURE	

SURFACE PREPARATION INSPECTION REPORT

FOR LIQUID BOOT® GAS VAPOR BARRIERS

JOB	
TIME	
DATE	

	YES	NO	N/A
Does site require inspection by a Government Authority or other inspection? If yes, who? **Inspecting agency: _____**			
Is there standing water? If yes, has all ponding water been removed from the membrane?			
Is ventilation required? If yes, what type? **Ventilation type: _____**			
Are precautions necessary for unprotected areas?			
Is the surface free of all dust?			
Is surface free of all dirt?			
Is the surface free of all grease?			
Is the surface free of all curing compounds or releasing agents?			
Are all voids prepared as specified inthe Liquid Boot Training Manual?			
Are all inside corners of 120° or less sealed with 3/4" cant of Trowel Grade?			
Is the geotextile rolled out with heat rolled side up?			
Is the geotextile free of wrinkles?			
Is the geotextile held tight inside of corners?			
Does the geotextile have a minimum of 6" overlap?			

REMARKS:	
APPLICATOR SIGNATURE	
INSPECTOR SIGNATURE	

LIQUID BOOT® MEMBRANE FIELD REPORT

FOR CETCO APPROVED APPLICATORS

JOB		**AREA REVIEWED**	
TEMP		**DATE SPRAYED**	
TIME		**DATE REVIEWED**	

	ACCEPTABLE	NOT ACCEPTABLE
Check condition of spray equipment (running smoothly)		
Check to make sure Applicator is properly stirring drums		
Check for proper spray technique -No arching, proper PRESSURE distance from surface		
Check for proper masking of rebar		
Check that concrete is clean, dry and bug holes filled		
Check that form tie holes a fully grouted and taped with Hardcast 1602		
Check overall thickness of membrane - **60 MILS DRY MINIMUM**		
Check membrane for shadows and holes		
Check the blisters for proper thickness		
Check stippled membrane for shrinkage and proper thickness		
Check around all penetrations for proper detailing		
Check for spraying too thick		
Check vertical to horizontal transitions for proper cant strips		
Check overall appearance of membrane		
Check for proper installation of geotextile - heat set side up, laid smoothly, minimum wrinkles		
Check for proper installation of drainage with fabric towards the earth		
TAKE PICTURES FOR MARKETING AND TO SHOW PROBLEM AREAS	**DONE: YES / NO**	

MATERIAL USAGE CHECK	TOTAL Square Footage Sprayed		SQ. FT.
* Maximum 800 & 825 sq. feet per	Divided by Number of Drums Used		DRUMS
"A" drum, for an 60 mil dry membrane	***Equals Square Feet Per Drum**		

REMARKS:	
SIGNATURE	

Send copies to: ☐Owner ☐Applicator ☐Architect ☐Engineer

NOTE: THE ABOVE REPORT IS GIVEN AS A COURTESY TO ASSIST THE APPLICATOR, JOB INSPECTOR AND GENERAL CONTRACTOR. DUE TO NUMEROUS REASONS FOR POTENTIAL LEAKS, THIS REPORT DOES NOT GUARANTEE THERE WILL BE NO LEAKS AND CETCO DOES NOT TAKE RESPONSIBILITY FOR IMPROPER APPLICATION. PROPER APPLICATION IS THE APPLICATOR'S RESPONSIBILITY.

COUPON TESTS	
TEST AREA	**SAMPLE THICKNESS**
1	
2	
3	

SMOKE TESTING		
TEST AREA	**PASS / FAIL**	**COMMENTS**
1		
2		
3		

LIQUID BOOT® MEMBRANE SMOKE TEST INSPECTION REPORT

GAS VAPOR BARRIERS

JOB	
TIME	
DATE	
TEST AREA	

	YES	NO	N/A
Does site require inspection by a Government Authority or other inspection? If yes, who? **Inspecting agency: _____**			
Was Liquid Boot applied onto geotextile (T-40/T-60) or geomembrane (VI-20)? **Base layer type: _____**			
Was ventilation installed below Liquid Boot membrane? If yes, what type? **Ventilation type: _____**			
Was Liquid Boot allowed to cure at least overnight? If no, how long? **Cure time: _____**			
Was Liquid Boot cured at temperature 45 degree F/7 degree C or above?			
Was Protection Course installed prior to smoke testing?			
During the smoke test was the approximate wind speed 15 mph or less			
Was smoke easily detected during inspection?			
Was leaked area(s) repaired/patched by certified applicator at time of inspection?			
Did Liquid Boot membrane pass smoke test inspection?			

REMARKS:	

INSPECTOR NAME & CO. (PRINTED)	
INSPECTOR SIGNATURE	
APPLICATOR NAME & CO. (PRINTED)	
APPLICATOR SIGNATURE	

Appendix G

PM ENVIRONMENTAL Environmental & Engineering Services

SB-1	
8/27/2020	
6.0 – 7.0'	
UNITS	ug/Kg
n-BUTYLB	520
sec-BUTYLB	200
E	260
p-ISOPT	200
2-M	7,100
NAPH	700
n-PROP	230
1,2,3-TMB	1,610
1,2,4-TMB	3,190
1,3,5-TMB	630
X	2,840
OTHER VOCs	<MDL
2-M	700
Ph	400
OTHER PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	10,900
Pb	10,900

SB-1	
8/27/2020	
13.5 – 14.5'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	17,100
Pb	6,980

SB-11	
12/21/2020	
3.0 ~ 4.0'	
UNITS	ug/Kg
VOCs	<MDL
B(a)ANTH	300
B(a)PYR	300
B(b)FLA	500
B(k)FLA	500
CHRYSENE	300
FL	600
Ph	400
Py	500
OTHER PNAs	<MDL

SB-11	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-3	
8/27/2020	
4.0 – 5.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	460
Cr	16,900
Pb	33,800

SB-3	
8/27/2020	
8.0 – 9.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	14,300
Pb	7,830

SB-4	
8/27/2020	
5.0 – 6.0'	
UNITS	ug/Kg
n-BUTYLB	700
n-PROP	160
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	<MDL
Cr	13,200
Pb	48,300

SB-16	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
n-BUTYLB	2,500
sec-BUTYLB	900
2-M	4,000
n-PROP	7,700
OTHER VOCs	<MDL
2-M	2,500
NAPH	1,600
OTHER PNAs	<MDL

SB-16	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-15	
12/21/2020	
3.0 ~ 4.0'	
UNITS	ug/Kg
n-BUTYLB	7,500
sec-BUTYLB	3,100
E	14,600
ISOP	7,000
2-M	12,000
NAPH	13,000
n-PROP	27,500
1,2,3-TMB	5,100
1,2,4-TMB	2,500
1,3,5-TMB	1,200
X	7,000
OTHER VOCs	<MDL
2-M	5,500
NAPH	5,500
OTHER PNAs	<MDL

SB-15	
12/21/2020	
6.0 ~ 7.0'	
UNITS	ug/Kg
n-BUTYLB	210
sec-BUTYLB	90
2-M	500
NAPH	1,600
n-PROP	1,500
OTHER VOCs	<MDL
NAPH	1,000
OTHER PNAs	<MDL

SB-15	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-5	
8/27/2020	
4.0 – 5.0'	
UNITS	ug/Kg
n-BUTYLB	2,410
sec-BUTYLB	800
E	1,400
ISOP	1,700
p-ISOPT	200
2-M	3,400
NAPH	3,300
n-PROP	6,890
T	160
1,2,3-TMB	350
1,2,4-TMB	160
1,3,5-TMB	640
X	400
OTHER VOCs	<MDL
2-M	2,100
NAPH	2,200
OTHER PNAs	<MDL

SB-14	
12/21/2020	
3.0 ~ 4.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-14	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-12	
12/21/2020	
6.0 ~ 7.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-12	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-13	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
VOCs	<MDL
B(a)ANTH	900
B(a)PYR	800
B(b)FLA	1,600
B(k)FLA	1,900
CHRYSENE	1,000
FL	1,600
Ph	700
Py	1,600
OTHER PNAs	<MDL

SB-13	
12/21/2020	
11.0 ~ 12.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-13	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-10	
12/21/2020	
6.5 ~ 7.5'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-10	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-2	
8/27/2020	
5.0 – 6.0'	
UNITS	ug/Kg
2-M	200
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
Cd	200
Cr	10,800
Pb	7,290

SB-17	
12/21/2020	
5.0 ~ 6.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-17	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-9	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
n-BUTYLB	13,800
sec-BUTYLB	4,500
E	1,700
ISOP	7,000
2-M	22,000
NAPH	14,000
n-PROP	29,900
X	2,000
OTHER VOCs	<MDL
2-M	7,900
NAPH	4,800
OTHER PNAs	<MDL

SB-9	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-8	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-8	
12/21/2020	
9.0 ~ 10.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-6	
12/21/2020	
10.0 ~ 11.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

SB-7	
12/21/2020	
4.0 ~ 5.0'	
UNITS	ug/Kg
n-BUTYLB	38,000
sec-BUTYLB	16,000
E	36,000
ISOP	20,000
2-M	45,000
NAPH	20,000
n-PROP	88,000
1,2,3-TMB	5,000
OTHER VOCs	<MDL
ANT	300
2-M	6,100
NAPH	3,200
OTHER PNAs	<MDL

SB-7	
12/21/2020	
7.0 ~ 8.0'	
UNITS	ug/Kg
E	110
n-PROP	410
1,2,3-TMB	70
OTHER VOCs	<MDL
PNAs	<MDL

SB-7	
12/21/2020	
14.0 ~ 15.0'	
UNITS	ug/Kg
VOCs	<MDL
PNAs	<MDL

651 BRAINE

ALLEY

PARCEL ID: 01000689-90

RESIDENTIAL

GRASS

GRAVEL

SECOND AVENUE

3522 2ND AVENUE

3514 2ND AVENUE

3500 2ND AVENUE

3470 2ND AVENUE

3469 2ND AVENUE

630 MARTIN LUTHER KING BOULEVARD

SIDEWALK

SB-2, SB-4, SB-5, SB-6, SB-7, SB-8, SB-9, SB-10, SB-11, SB-12, SB-13, SB-14, SB-15, SB-16, SB-17, SB/SG-1, SB/SG-3, SB/SG-5

GAS

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- FENCE
- PROPOSED SITE FEATURES
- GAS
- FORMER GAS
- (A) FORMER AUTOMOTIVE/BATTERY/TIRE SHOP
- (D) FORMER DWELLING
- (G) FORMER GASOLINE FILLING STATION / DISPENSERS / USTs
- UST UNDERGROUND STORAGE TANK
- SOIL BORING
- SOIL BORING / TEMPORARY MONITORING WELL

Cd	CADMIUM
Cr	CHROMIUM
Pb	LEAD
2-M	2-METHYLNAPHTHALENE
NAPH	NAPHTHALENE
Ph	PHENANTHRENE
T	TOLUENE
E	ETHYLBENZENE
X	XYLENES
1,2,4-TMB	1,2,4-TRIMETHYLBENZENE
1,3,5-TMB	1,3,5-TRIMETHYLBENZENE
1,2,3-TMB	1,2,3-TRIMETHYLBENZENE
ISOP	ISOPROPYLBENZENE
p-ISOPT	p-ISOPROPYLTOLUENE
n-PROP	n-PROPYLBENZENE
n-BUTYLB	n-BUTYLBENZENE
sec-BUTYLB	sec-BUTYLBENZENE
ANT	ANTHRACENE
B(a)ANTH	BENZO(a)ANTHRACENE
B(a)PYR	BENZO(a)PYRENE
B(b)FLA	BENZO(b)FLUORANTHENE
B(k)FLA	BENZO(k)FLUORANTHENE
FL	FLUORANTHENE
Py	PYRENE
VOCs	VOLATILE ORGANIC COMPOUNDS
PNAs	POLYNUCLEAR AROMATIC COMPOUNDS
PCBs	POLYCHLORINATED BIPHENYLS
MDL	METHOD DETECTION LIMIT

VALUE EXCEEDS SSVIAC AND/OR RESIDUAL LNAPL SATURATION PRESENT IN SOIL

REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE A

SOIL ANALYTICAL RESULTS

PROJ:

VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE 0 30'

IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS/BP | DATE: 2/12/2021

CHKD BY: JB | SCALE: 1" = 30'

FILE NAME: 01-12411-0-001F00R00

651 BRAINARD STREET

ALLEY

RESIDENTIAL

GRASS

PARCEL ID:
01000689-90

GRAVEL

SECOND AVENUE

3522 2ND AVENUE

3514 2ND AVENUE

3500 2ND AVENUE

3470 2ND AVENUE

3469 2ND AVENUE

630 MARTIN LUTHER KING BOULEVARD

631 MARTIN LUTHER KING JUNIOR BOULEVARD

MARTIN LUTHER KING JUNIOR BOULEVARD

SIDEWALK

SB-12
SB-11
SB/SG-1
SB-13
SB-10
SB-2
SB/SG-3
SB-4
SB-16
SB-17
SB-15
SB-9
SB-14
SB-7
SB/SG-5
SB-6
SB-8

SG-1	
8/27/2020	
5.0'	
UNITS	ug/m³
B	480
CYCLOHEXANE	6,200
E	480
HEPTANE	8,440
HEXANE	3,500
T	1,300
X	3,500
OTHER VOCs	<MDL

SG-3	
8/27/2020	
5.0'	
UNITS	ug/m³
ACETONE	330
B	32
CYCLOHEXANE	130
ETHANOL	85
E	100
4-ETHYLTOLUENE	84
HEPTANE	330
HEXANE	100
2-HEXANONE	45
MEK	440
1,2,4-TMB	230
1,3,5-TMB	93
2,2,4-TMP	140
PCE	34
TETRAHYDROFURAN	15
T	170
X	1,140
OTHER VOCs	<MDL

SG-5	
8/27/2020	
5.0'	
UNITS	ug/m³
CYCLOHEXANE	125,000
E	13,000
HEPTANE	210,000
HEXANE	234,000
2,2,4-TMP	214,000
OTHER VOCs	<MDL

LEGEND:

- SUBJECT PROPERTY
- APPROXIMATE FORMER/HISTORICAL SITE FEATURES
- FENCE
- PROPOSED SITE FEATURES
- GAS
- FORMER GAS
- (A) FORMER AUTOMOTIVE/BATTERY/ TIRE SHOP
- (D) FORMER DWELLING
- (G) FORMER GASOLINE FILLING STATION / DISPENSERS / USTs
- UST UNDERGROUND STORAGE TANK
- SOIL BORING
- SOIL BORING / TEMPORARY MONITORING WELL

B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	XYLENES
1,2,4-TMB	1,2,4-TRIMETHYLBENZENE
1,3,5-TMB	1,3,5-TRIMETHYLBENZENE
2,2,4-TMP	2,2,4-TRIMETHYLPENTANE
PCE	TETRACHLOROETHENE
MEK	2-BUTANONE (MEK)
VOCs	VOLATILE ORGANIC COMPOUNDS
MDL	METHOD DETECTION LIMIT

- VALUE EXCEEDS SSVIAC

NOTES: REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE B

SOIL GAS ANALYTICAL RESULTS

PROJ:

VACANT LAND
3515 2ND AVENUE
DETROIT, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 30'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: KS/BP
CHKD BY: JB
DATE: 1/19/2021
SCALE: 1" = 30'
FILE NAME: 01-12411-0-001F00R00