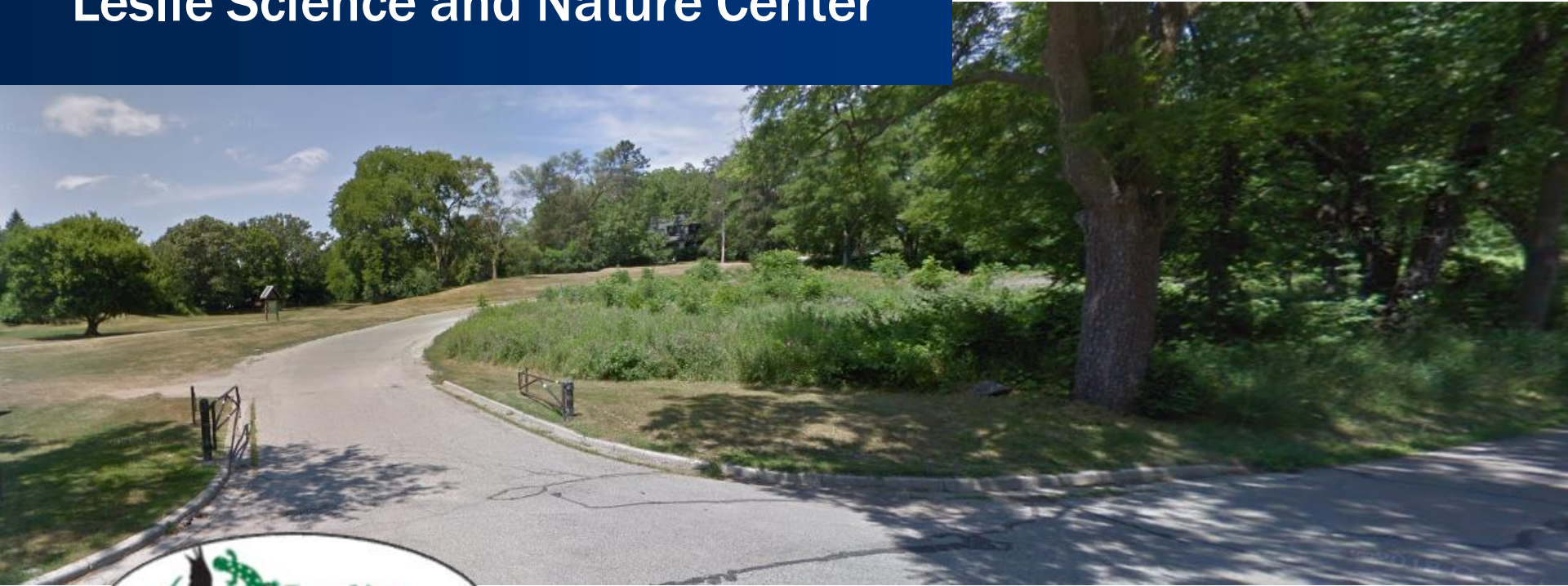


Leslie Science and Nature Center



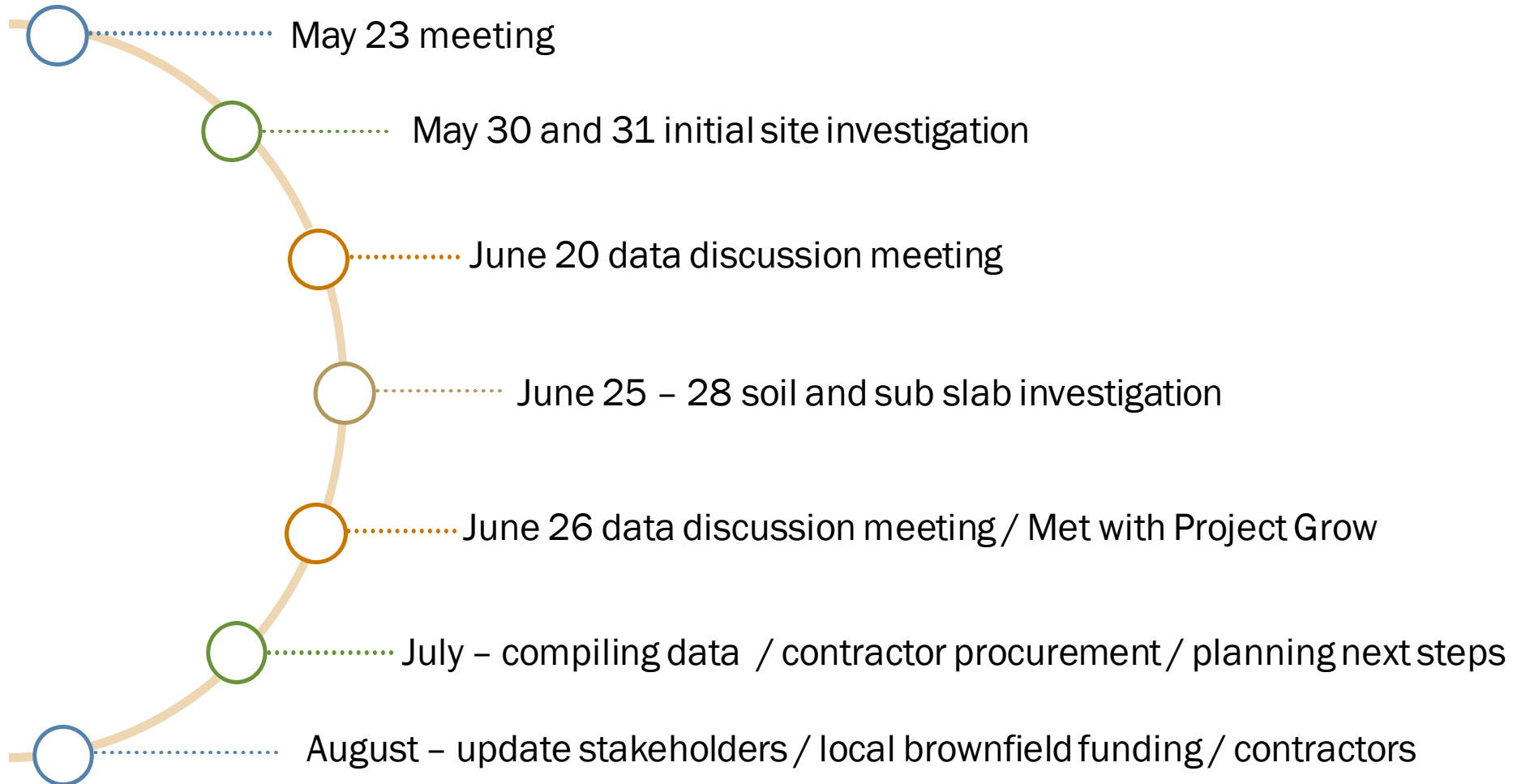
INVESTIGATION UPDATE

OVERVIEW

- Timeline
- Target Areas
- Field Work Completed
- Contaminants
- Pathways / Criteria
- Vapor Intrusion
- Soil Data Findings
- Remediation
- Schedule



TIMELINE – Major Milestones

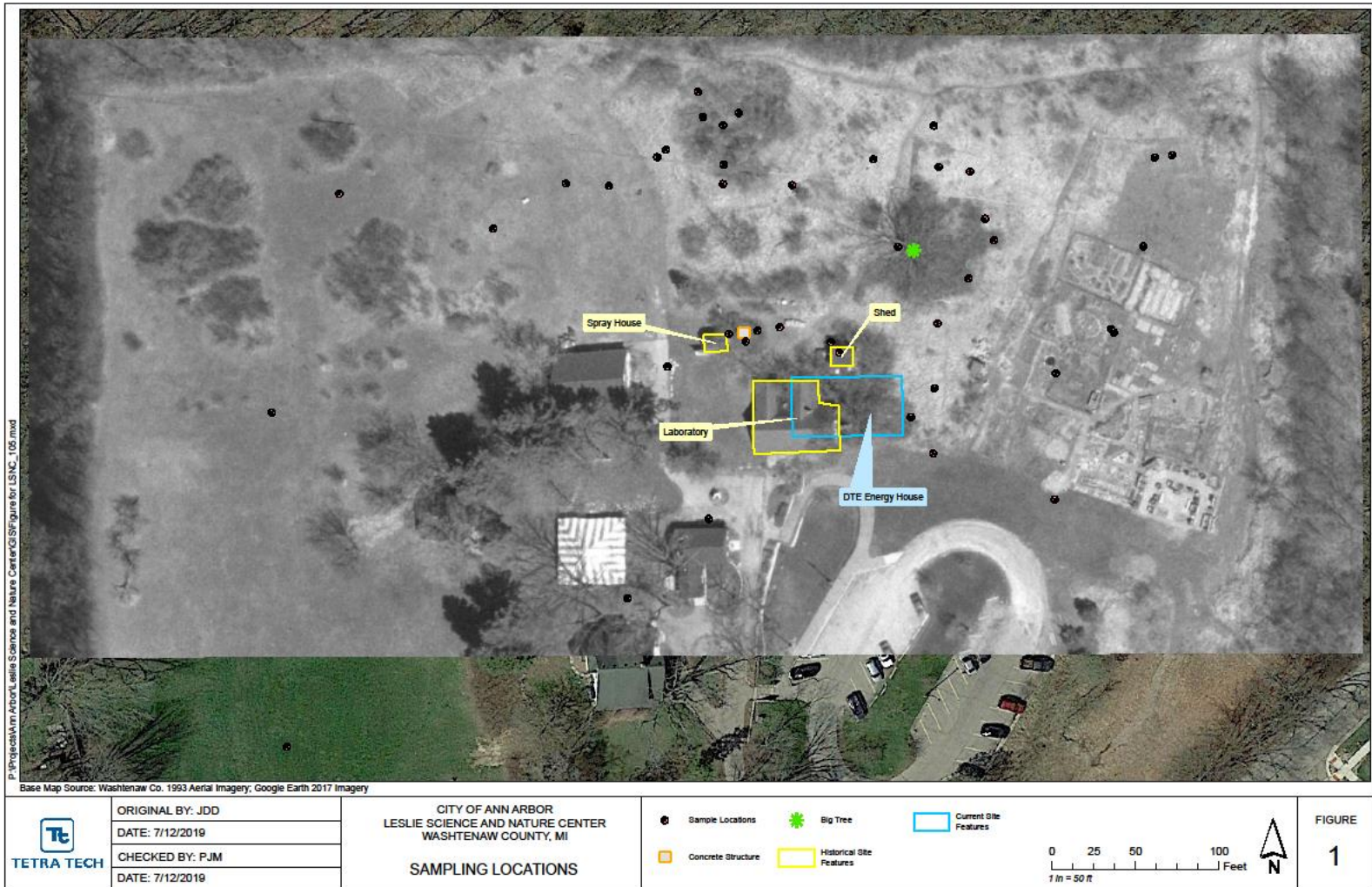


TARGET AREAS



- Depression
- Pit
- Areas near former laboratory
- Information reviewed
 - Historical documents from City
 - Historical documents from EGLE
 - Historical aerials
 - Area well information

TARGET AREAS



TARGET AREAS - Pit




FIELD WORK COMPLETED TO DATE



- 49 Investigation points
- 80 Soil samples analyzed:
 - 80 Michigan 10 metals
 - 42 VOCs
 - 16 SVOCs
 - 16 PCBs
 - 16 Fertilizers, pesticides and herbicides
 - 5 Hexavalent chromium
- Groundwater not encountered (to 35 feet)

FIELD WORK COMPLETED TO DATE



	DESIGNED BY: JDD	<p>CITY OF ANN ARBOR LESLIE SCIENCE AND NATURE CENTER WASHTENAW COUNTY, MI</p> <p>SAMPLING LOCATIONS</p>	<p>● Sample Locations</p>	<p>FIGURE 1</p>
	DATE: 6/25/2019			
	CHECKED BY: PJM			
	DATE: 8/16/2019			

CONTAMINANTS DETECTED

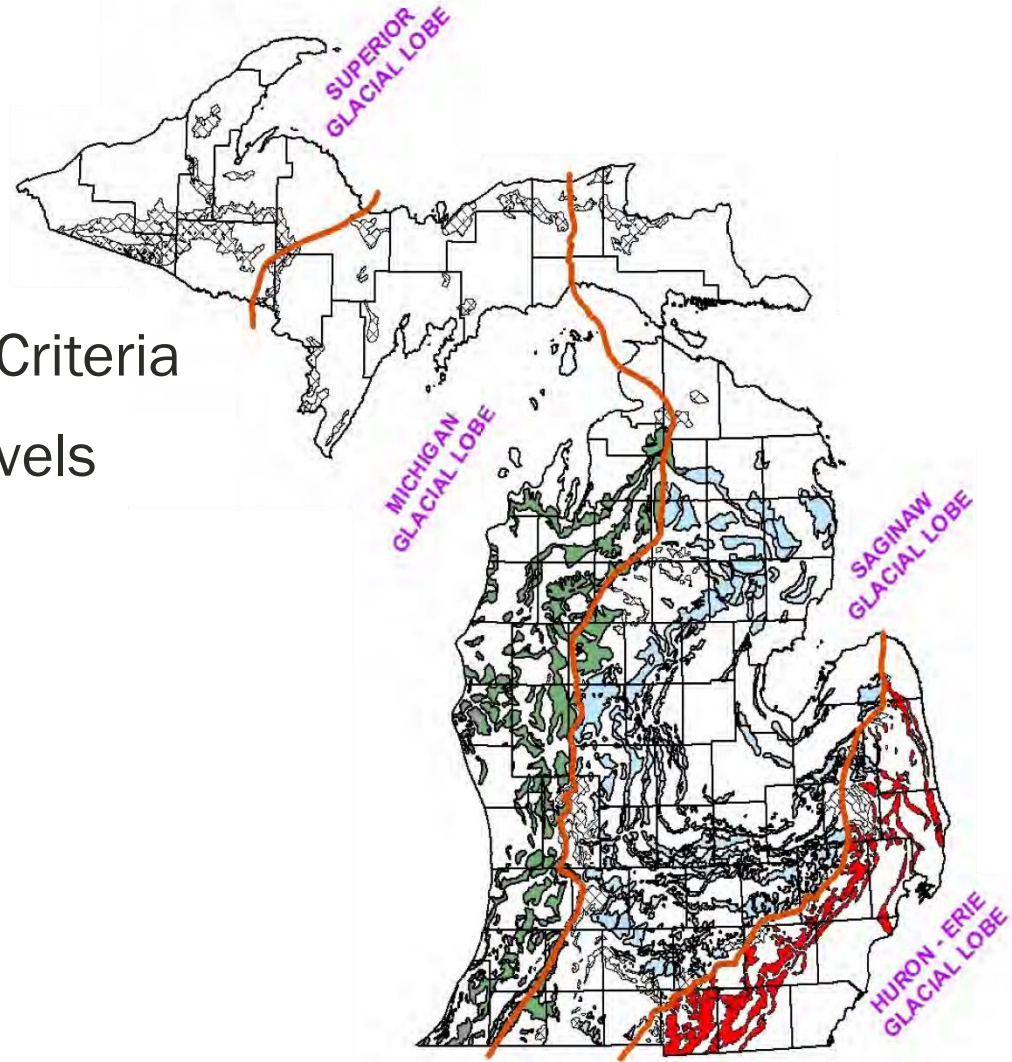
- Metals – Soil
 - Arsenic
 - Depression – all metals detected
- VOCs – Soil and Air
 - PCE
 - TCE
 - Carbon tetrachloride
 - Chloroform

APPLICABLE PATHWAYS

- No Groundwater onsite
- Incomplete pathways
 - Drinking water protection (DWP)
 - Groundwater to surface water interface protection (GSIP)
- Applicable Pathways
 - Soil Direct Contact (DC)
 - Soil Indoor and Ambient Air

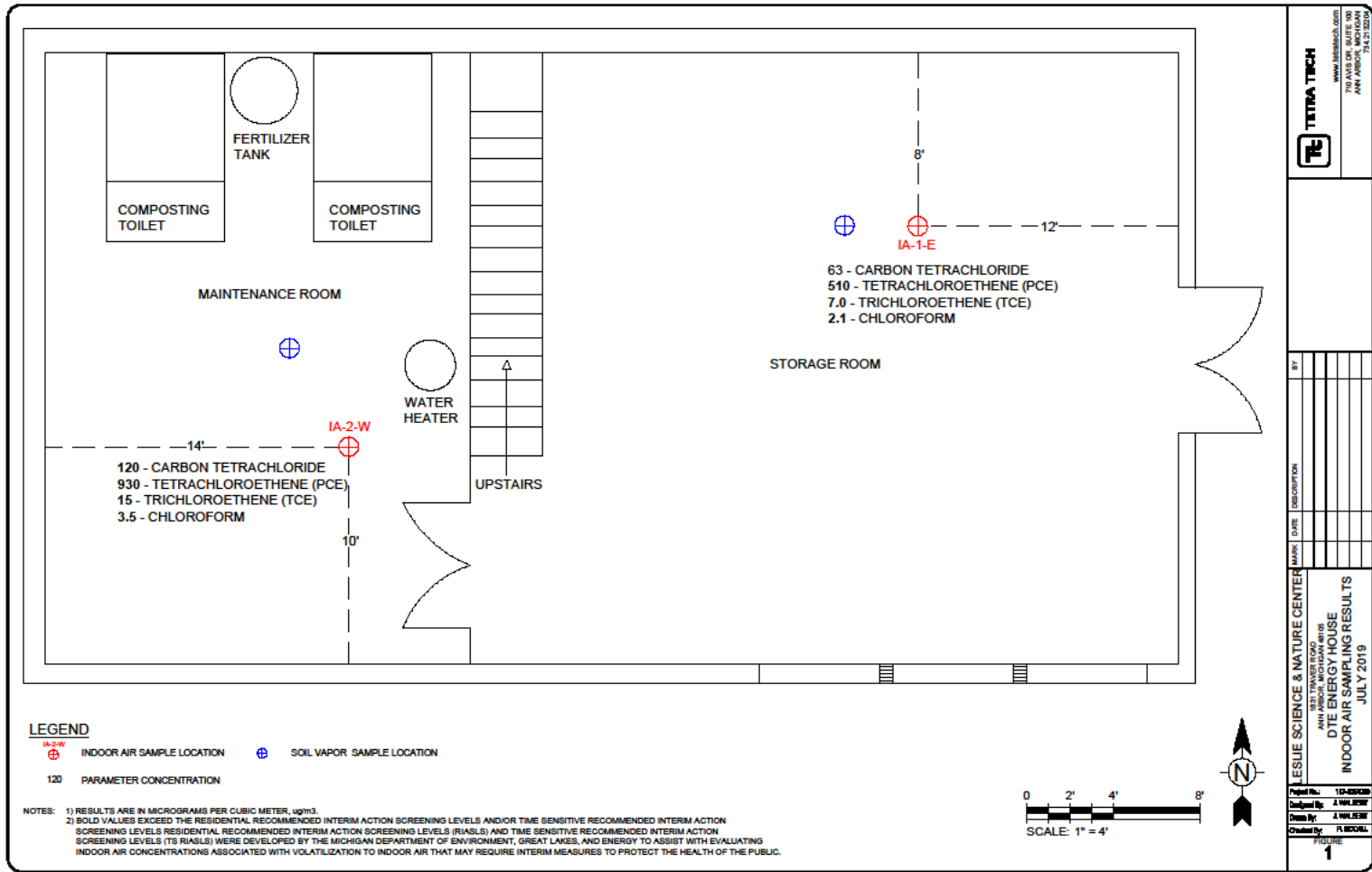
CRITERIA DISCUSSION

- Residential / Nonresidential Criteria
- State Default Background Levels
- Site-specific bioavailability determination - arsenic
- LSNC data comparison



VAPOR INTRUSION – Sub Slab

7/25/2019 3:24:44 PM - P:\PROJECTS\ANN ARBOR\LESLIE SCIENCE AND NATURE CENTER\CAVOTTE ENERGY HOUSE INDOOR AIR SAMPLING LAYOUT.DWG - WALBERT, JARED



TETRA TECH
 www.tetra-tech.com
 7700 WALKER AVE SUITE 2000
 ANN ARBOR, MICHIGAN
 734.432.0200

BY	DATE	DESCRIPTION

LESLIE SCIENCE & NATURE CENTER
 1831 TRAVELER ROAD
 ANN ARBOR ENERGY HOUSE
 INDOOR AIR SAMPLING RESULTS
 JULY 2019

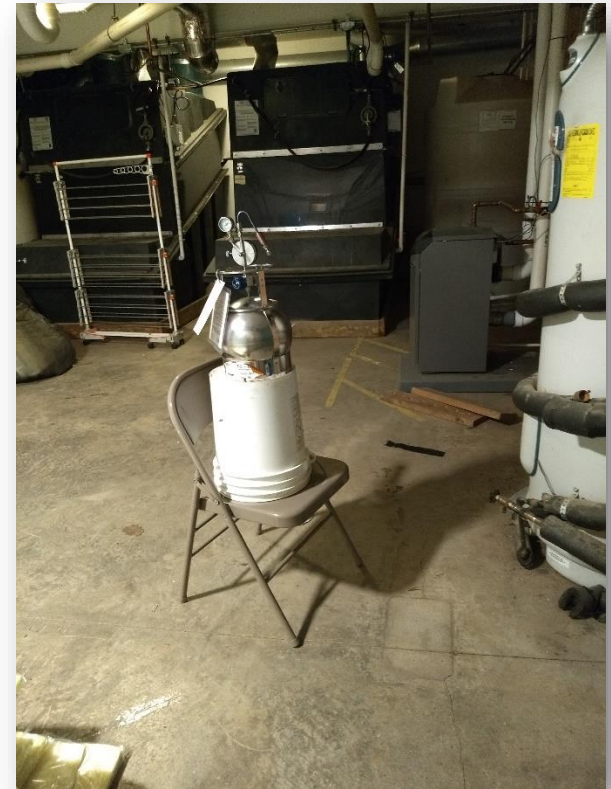
Project No: 19-05000
 Design No: 4 WALKER
 Drawn By: J. WALBERT
 Checked By: P. RICARD

FIGURE 1

Copyright Tetra Tech

VAPOR INTRUSION

- Vapor Pins
- Indoor Air Summa Canisters downstairs and upstairs



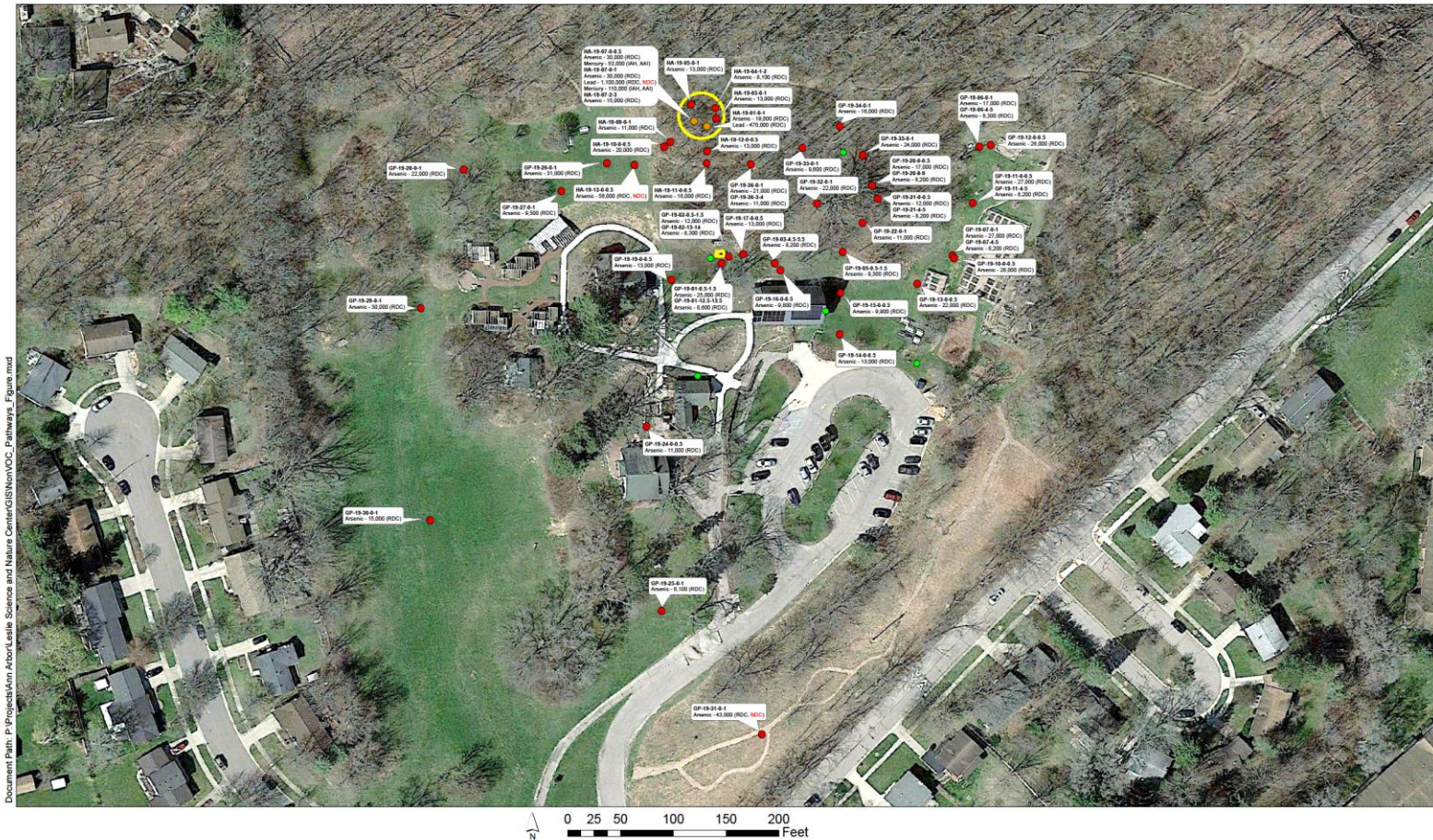
VAPOR INTRUSION – Vapor Pins/Summa Data

DTE Energy House Indoor Air Sampling			
Contaminant of Concern (COC)	Indoor Air Analytical Results	Residential Time Sensitive Recommended Interim Action Screening Levels	Residential Recommended Interim Action Screening Levels
Carbon Tetrachloride*	East Side of Basement: 63 ug/m3	189 ug/m3	104.3 ug/m3
	West Side of Basement: 120 ug/m3	189 ug/m3	104.3 ug/m3
	Center of Main Floor: 2.4 ug/m3	189 ug/m3	104.3 ug/m3
Tetrachloroethene (PCE)	East Side of Basement: 510 ug/m3	41 ug/m3	41 ug/m3
	West Side of Basement: 930 ug/m3	41 ug/m3	41 ug/m3
	Center of Main Floor: 16 ug/m3	41 ug/m3	41 ug/m3
Chloroform	East Side of Basement: 2.1 ug/m3	11 ug/ m3	1.1 ug/ m3
	West Side of Basement: 3.5 ug/m3	11 ug/ m3	1.1 ug/ m3
Trichloroethene (TCE)	East Side of Basement: 7.0 ug/m3	6.0 ug/m3	2.0 ug/m3
	West Side of Basement: 15.0 ug/m3	6.0 ug/m3	2.0 ug/m3
	Center of Main Floor: 0.29 ug/m3	6.0 ug/m3	2.0 ug/m3

SOIL DATA FINDINGS - Metals

- Arsenic is widespread
 - Residential direct contact
 - Nonresidential direct contact (2)
- Depression includes:
 - Mercury – Soil Volatilization to Indoor Air Inhalation; Ambient Air volatile soil inhalation criteria
 - Lead – Nonresidential direct contact
 - Arsenic – Residential direct contact

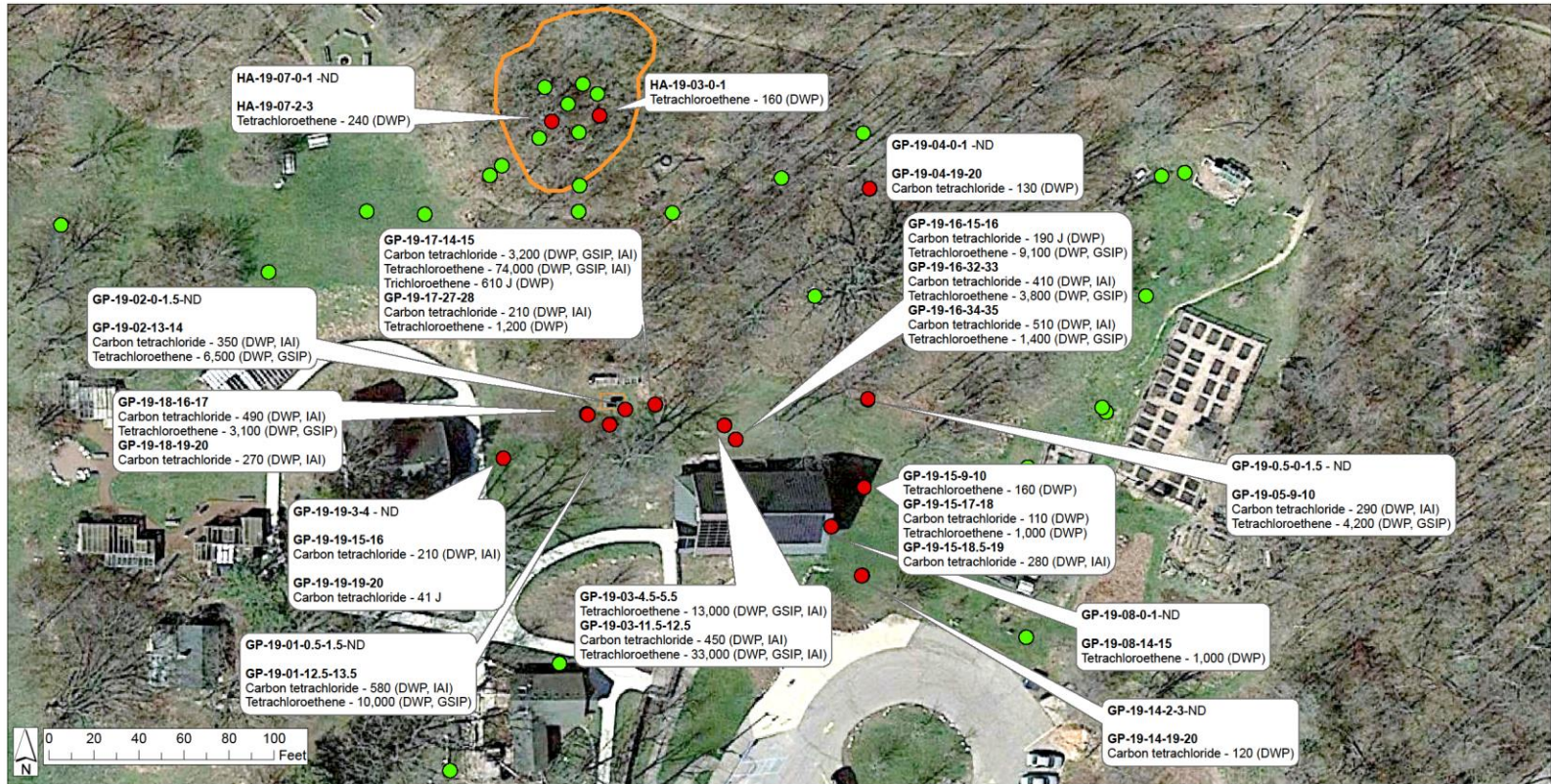
SOIL DATA FINDINGS – Metals Distribution



	DRAFT BY: JSR	Surface Soil Sample Locations <ul style="list-style-type: none"> ● Multiple Contaminants Above Relevant Criteria ● Arsenic Above Relevant Criteria ● Results Below Relevant Criteria Areas of Concern 	RESULTS WITH RELEVANT PATHWAYS LESLIE SCIENCE AND NATURE CENTER ANN ARBOR, MICHIGAN	FIGURE #
	DATE: 07/25/2019			
	EDITED BY: JSR			
	DATE: 07/25/2019			
REVIEWER: PJM	<small>Notes:</small> 1. Results are in mg/kg 2. SW = Indoor Air Inhalation, AAI = Ambient Air Inhalation, PSD = Particulate Soil Inhalation, RDC = Residential Direct Contact, NDC = Nonresidential Direct Contact 3. Soil Concentration at GP-19-09 and GP-19-14 for mercury.			

SOIL DATA FINDINGS – CVOCs Distribution

Document Path: P:\Projects\Ann Arbor\Leslie Science and Nature Center\GIS\CVOCs_Figure_Revised for data gaps analysis.mxd



	CREATED BY: JSR	Sampling Points	CITY OF ANN ARBOR LESLIE SCIENCE AND NATURE CENTER WASHTENAW COUNTY, MI	FIGURE 4
	DATE: 7/19/2019	● Above EGLE Criteria — Depression Area ● Below EGLE Criteria □ Pit Area		
	REVIEWED BY: PJM	Notes: 1. Results are in ug/Kg 2. DWP = Drinking Water Protection, GSIP = Groundwater Surface Water Interface Protection, IA = Indoor Air Inhalation 3. J = Result is less than the analytical method reporting limit but above the method decision limit. Result is an approximate value.		
DATE: 7/22/2019				

REMEDIATION

- Indoor Air Issues – DTE House
 - Seal all cracks
 - Install subslab system
 - Install vapor pins for monitoring
- Identified Features - Excavation
 - Depression
 - Pit Area
- Sitewide metal exceedances
 - Relative bioavailable arsenic for site specific concentration
 - Due Care Obligations
- Chlorinated VOC delineation

SCHEDULE

- Indoor Air Remediation – August sealing; September 16 system
- Excavation – Depression and pit – August/Sept
- Third drilling investigation for VOCs – August 28 - 30
- Arsenic statistical analysis – August/Sept

