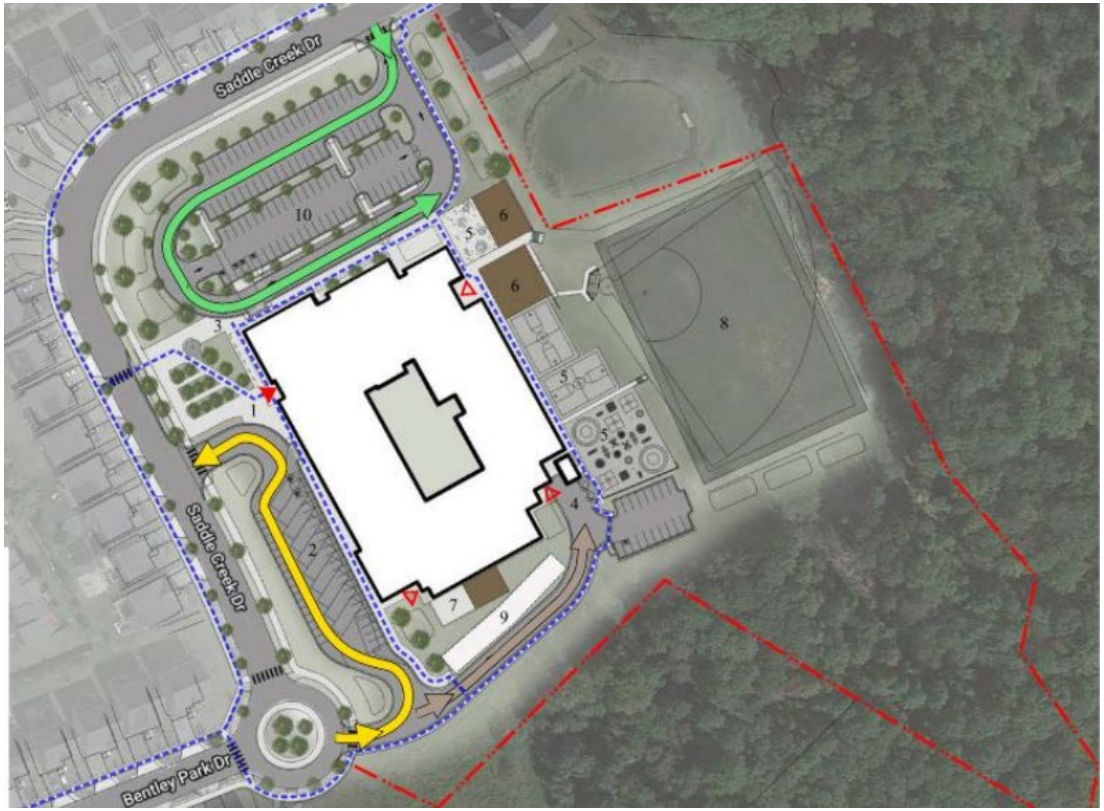
Proposed Burtonsville Elementary School



14709 Saddle Creek Drive
Burtonsville, Maryland 20866

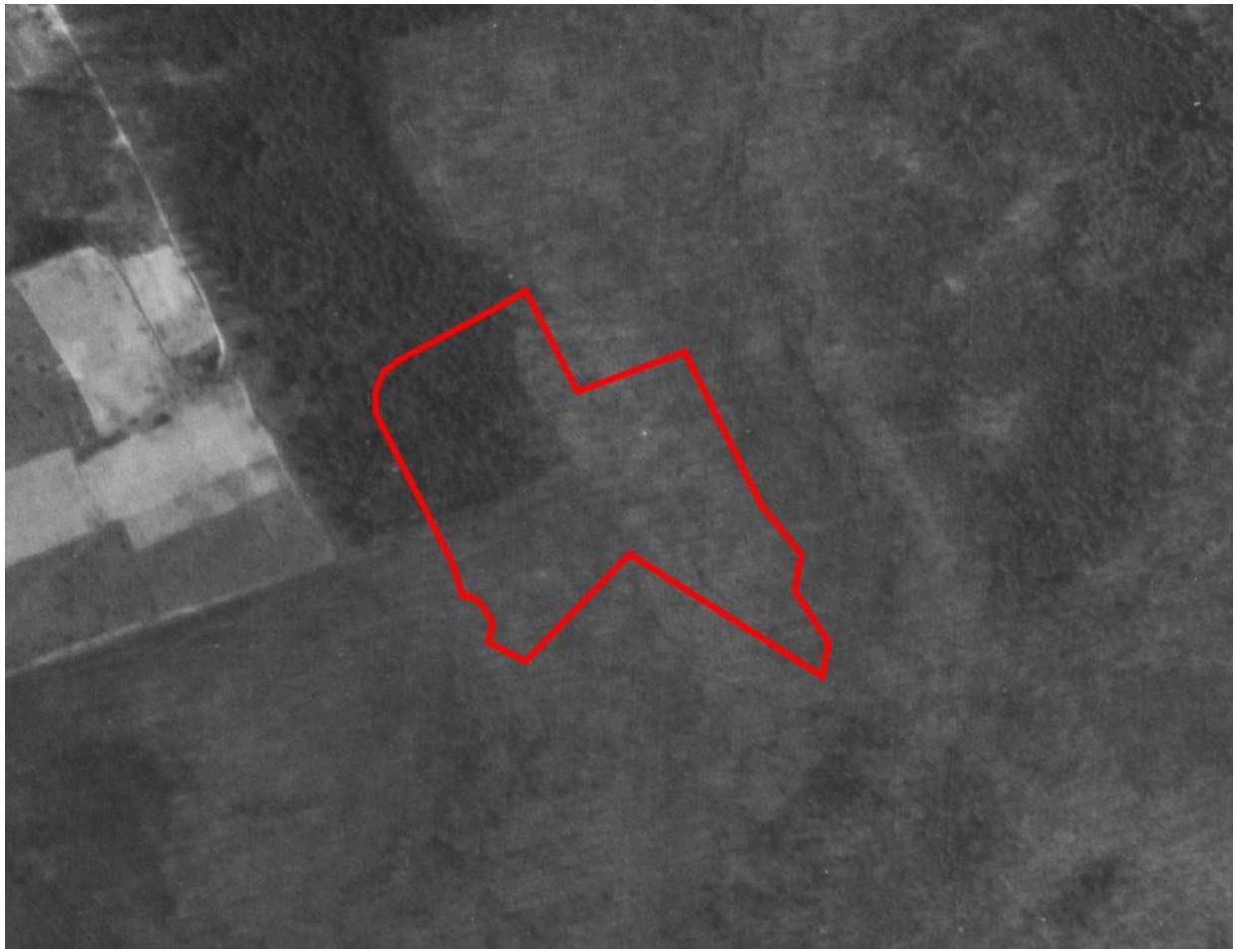
Site History

- The site has consisted of undeveloped, wooded land since at least 1938. The site use remained generally unchanged until circa 1963, when the eastern and western portions of the site were disturbed during a surface mining operation (i.e., sand and gravel pit). By 2007, the site was partially reforested until the northern portion was cleared of trees and became a grassy field. The site remained as such until development began in 2025.

- Since there was no documentation available regarding the source of the fill material used in the surface mine's reclamation, ECS recommended an environmental assessment to evaluate the conditions at the site.

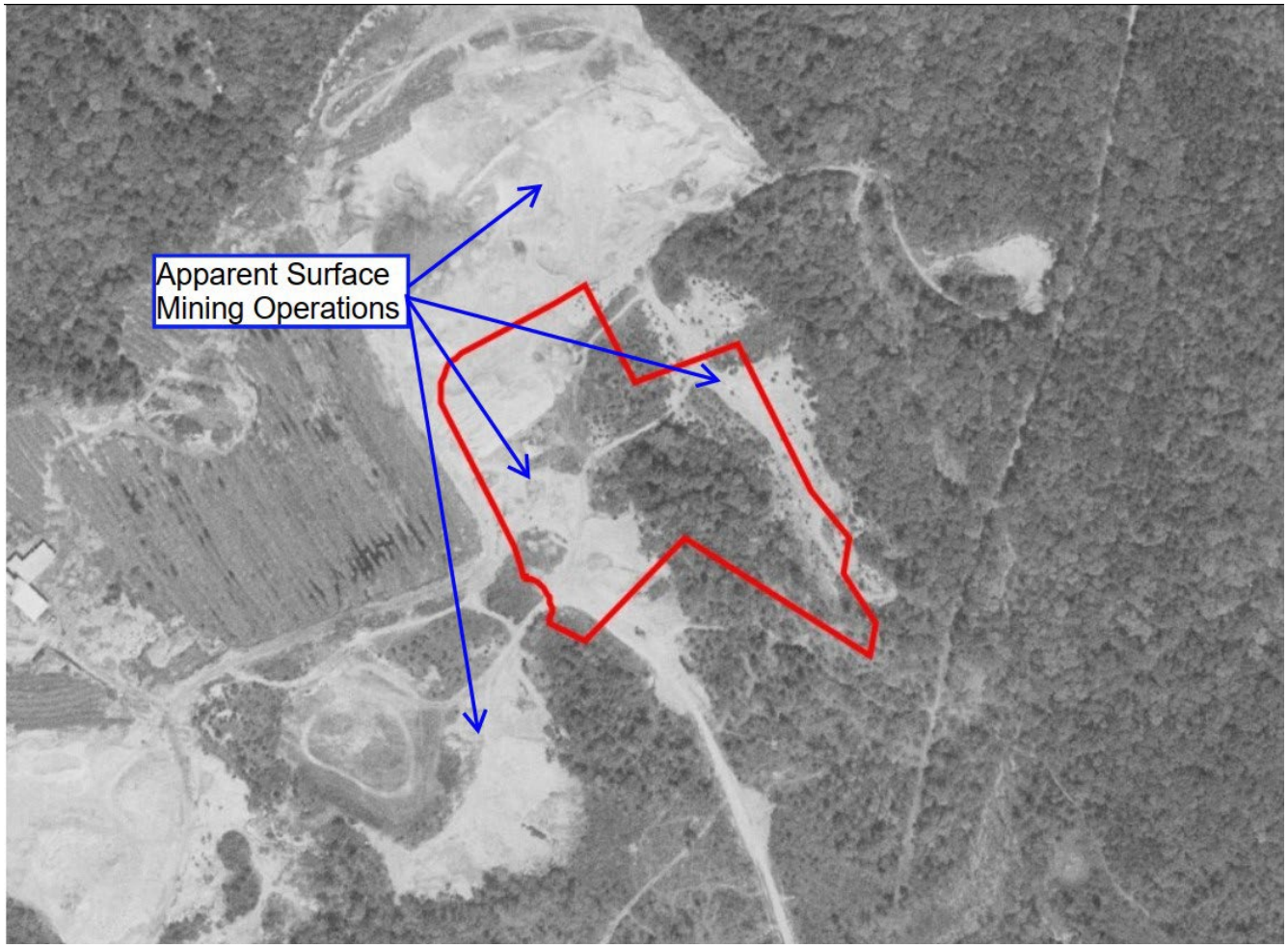
Site History

- 1938 aerial photograph



Site History

- 1979 aerial photograph



Environmental Study

- As part of the due diligence process, environmental assessments and subsequent testing of the property were performed to evaluate the existing site conditions.
  - Multiple rounds of studies were performed in 2024 and 2025.
- Testing included the collection of soil samples as well as groundwater, soil vapor, and ambient air samples.

May 2024 Assessment

Table 1A
Saddle Creek Property
Composite Soil Sample Analytical Results

Sample ID	OU-1A	OU-1B	OU-1C	OU-1D	OU-2A	OU-2B	OU-2C	OU-2D	MDE Residential Soil Cleanup Standard (mg/kg)
Date Collected	02-May-24	02-May-24	02-May-24	02-May-24	01-May-24	01-May-24	01-May-24	01-May-24	
Approximate Depth (Feet)	0-2	2-5	5-10	10-15	0-2	2-5	5-10	10-15	
Semivolatile Organics by EPA 8270D (mg/kg)									
Total Semivolatile Organics	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	Varies
Polychlorinated Biphenyls by EPA 8082A (mg/kg)									
Total Polychlorinated Biphenyls	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	ND (Varies)	Varies
Total Metals Analysis by EPA 6020B (mg/kg)									
Arsenic	1.88	2.93	2.59	1.97	5.25	3.99	3.61	5.63	10[1]
Beryllium	ND (0.270)	0.315	ND (0.278)	ND (0.287)	0.357	0.43	0.317	ND (0.304)	15,000
Chromium	10.5	15.4	10.7	9.82	20.8	17.7	18.1	25.9	12,000[2]
Copper	5.06	5.65	6.49	4.45	7.21	8.32	7.79	12.2	310
Lead	4.46	4.22	3.96	3.09	5.18	6.72	3.9	5.4	200
Mercury	0.0148	0.0172	0.0176	0.0199	0.027	0.0344	ND (0.0144)	0.0307	1.1
Nickel	2.88	2.93	2.53	2.88	4.38	8.06	1.56	0.709	150
Selenium	0.747	0.854	1.07	1.23	1.1	1.27	1.23	1.69	39
Zinc	8.65	8.72	8.81	8.26	15.1	22.8	6.59	8.51	2,300
Hexavalent Chromium by EPA 7199 (mg/kg)									
Chromium, Hexavalent	ND (0.162)	ND (0.166)	ND (0.167)	ND (0.172)	0.171	0.263	**0.382**	**0.461**	0.3

(1) The MDE has adopted a standard which incorporates the bioavalability. The above standard is the typical bioavailability standard enforced by the MDE.
(2) Trivalent chromium standard
NA = Not analyzed
RSL = EPA Regional Screening Level
NP = The MDE/EPA has no published standard
mg/kg = Parts per million (milligrams per kilogram)
ND (#) = Not Detected (Laboratory Detection Limit)

Table 3
Saddle Creek Property
Soil Vapor Sample Analytical Results

Sample ID	SV1-01	SV1-06	SV1-10	SV2-01	SV2-05	MDE Tier 1 Residential Soil Vapor Screening Level	MDE Tier 2 Residential Soil Vapor Screening Level
Date Collected	02-May-24	02-May-24	02-May-24	02-May-24	02-May-24		
Approximate Depth (Feet)	5	5	5	5	5	($\mu g/m^3$)	($\mu g/m^3$)
Volatile Organics by EPA TO-15 ($\mu g/m^3$)							
Acetone	31.5	ND (9.60)	81.1	12.3	15.8	660,000	3,300,000
Benzene	5.75	53.7	3.96	11	ND (0.64)	64	320
1,3-Butadiene	ND (1.76)	ND (1.76)	ND (1.76)	4.25	ND (1.76)	16.4	82
Carbon Disulfide	6.48	24.4	ND (6.24)	ND (6.24)	ND (6.24)	14,600	73,000
Chloroform	1.76	ND (0.97)	0.98	5.86	ND (0.97)	22	110
Chloromethane	0.5	ND (0.41)	0.99	ND (0.41)	0.99	1,880	9,400
Cyclohexane	1.51	26.7	3.58	ND (0.69)	ND (0.69)	126,000	630,000
1,4-Dichlorobenzene	ND (1.20)	ND (1.20)	**88.3**	33.4	**50.7**	46	230
1,2-Dichloropropane	ND (0.92)	ND (0.92)	1.11	ND (0.92)	ND (0.92)	84	420
Ethyl Acetate	ND (14.4)	ND (14.4)	46.1	ND (14.4)	ND (14.4)	1,480	7,400
Ethylbenzene	2.43	7.82	22.4	1.56	ND (0.87)	200	1,000
4-Ethyltoluene	1.57	2.16	ND (0.98)	ND (0.98)	ND (0.98)	NP	NP
N-Heptane	14.9	211	28.5	6.89	0.98	8,400	42,000
Hexane	ND (56.0)	584	ND (56.0)	ND (56.0)	ND (56.0)	14,600	73,000
Isopropylbenzene (Cumene)	ND (1.60)	ND (1.60)	1.97	ND (1.60)	ND (1.60)	8,400	42,000
Methyl Tert-Butyl Ether (MTBE)	0.87	ND (0.82)	ND (0.82)	ND (0.82)	ND (0.82)	1,880	9,400
Methyl Ethyl Ketone (2-Butanone)	7.08	7.2	10	ND (1.36)	ND (1.36)	106,000	530,000
Methyl Isobutyl Ketone	ND (3.28)	ND (3.28)	3.44	ND (3.28)	ND (3.28)	64,000	320,000
Propene	253	3500	408	22.7	9.29	64,000	320,000
Styrene	1.02	2.22	ND (0.59)	1.02	1.7	21,000	105,000
Tetrachloroethene	8.95	ND (2.80)	ND (2.80)	ND (2.80)	ND (2.80)	840	4,200
Toluene	15.5	74.5	31.7	21.6	3.77	106,000	530,000
Trichlorofluoromethane (Freon 11)	1.35	1.57	ND (1.10)	1.35	1.35	14,600	73,000
1,2,4-Trimethylbenzene	1.18	1.57	2.36	ND (0.98)	ND (0.98)	1,260	6,300
2,2,4-Trimethylpentane	ND (0.93)	ND (0.93)	4.67	2.06	ND (0.93)	NP	NP
Vinyl Chloride	ND (0.51)	ND (0.51)	ND (0.51)	0.51	ND (0.51)	34	170
O-Xylene	1.74	3.65	17	1.22	ND (0.87)	2,100	10,500
M- & P-Xylenes	4.69	10.3	38.9	3.13	1.91	2,100	10,500

Maryland Department of the Environment Land Restoration Program Vapor Intrusion Guidance Document. Published September 2019.
NP = The MDE has no published standard
ND (#) = Not Detected (Laboratory Detection Limit)
µg/m3 = Parts per billion (micrograms per cubic meter)

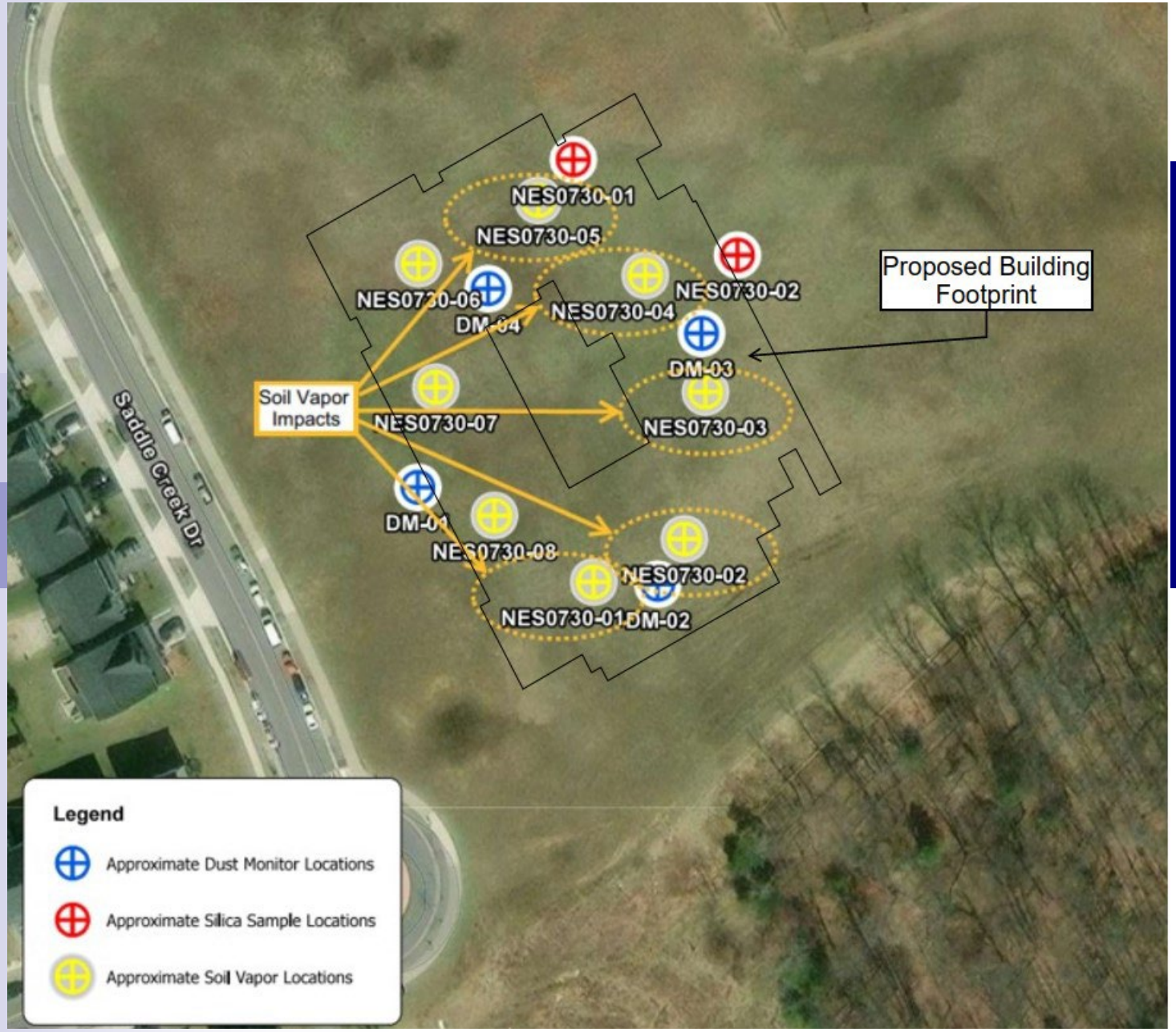
May 2024 Conclusions

- Heavy Metals – Concentrations of Hexavalent Chromium exceeding the MDE's most stringent screening level were identified at depths of 5 to 15 feet below surface grade in the wooded area located on the southeastern portion of the site.
  - Hexavalent Chromium is primarily produced through industrial processes but can also occur naturally.

- Volatile Organic Compound (VOC) – Concentrations of 1,4-Dichlorobenzene were identified in the soil vapor samples collected on the eastern and southeastern portions of the field and the wooded portion of the site.
  - 1,4-Dichlorobenzene is used in disinfectants, pesticides, and deodorants.

Action: ECS recommended that the heavy metal-impacted soil remain capped below at least 2 feet of clean fill and that additional vapor sampling be performed within the footprint of the proposed building to determine the need for a sub-slab vapor mitigation system.

August 2024 Assessment



August 2024 Results

Table 1

Soil Vapor Sample Analytical Results

Sample ID	NES 0730-01	NES 0730-02	NES 0730-03	NES 0730-04	NES 0730-05	NES 0730-06	NES 0730-07	NES 0730-08	MDE Tier 1 Residential Soil	MDE Tier 2 Residential Soil
Date Collected	30-Jul-24	30-Jul-24	30-Jul-24	30-Jul-24	30-Jul-24	30-Jul-24	30-Jul-24	30-Jul-24	Vapor Screening Level ($\mu g/m^3$)	Vapor Screening Level ($\mu g/m^3$)
Approximate Depth (Feet)	5	5	5	5	5	5	5	5		
Volatile Organics by EPA TO-15 ($\mu g/m^3$)										
Acetone	18.7	19.1	66.7	22	ND (9.60)	ND (9.60)	15.7	12.7	660,000	3,300,000
Benzene	9.58	10.4	10.9	5.62	13.7	10.4	3.45	4.09	64	320
Bromodichloromethane	ND (1.30)	ND (1.30)	4.56	ND (1.30)	ND (1.30)	ND (1.30)	ND (1.30)	ND (1.30)	13.2	66
Carbon Disulfide	11.6	29.9	22	19.8	152	33.6	16.8	73.1	14,600	73,000
Chloroform	65	123	110	73	3.12	3.52	0.98	ND (0.97)	22	110
Chloromethane	ND (0.41)	ND (0.41)	ND (0.41)	ND (0.41)	0.66	ND (0.41)	ND (0.41)	ND (0.41)	1,880	9,400
Cyclohexane	2.07	1.51	ND (0.69)	ND (0.69)	2.62	2.48	1.65	ND (0.69)	126,000	630,000
1,4-Dichlorobenzene	ND (1.20)	ND (1.20)	ND (1.20)	45.9	52.2	39.2	36.1	41.1	46	230
Cis-1,2-Dichloroethene	ND (0.79)	ND (0.79)	ND (0.79)	ND (0.79)	ND (0.79)	0.79	ND (0.79)	ND (0.79)	740	3,700
Ethylbenzene	5.21	3.82	3.65	2.26	9.9	7.82	3.47	2.08	200	1,000
4-Ethyltoluene	1.57	1.18	1.38	ND (0.98)	3.74	4.13	1.57	1.18	NP	NP
N-Heptane	45.4	22.1	7.54	9.51	57.2	66.6	17.2	7.21	8,400	42,000
Hexane	93.8	58.5	ND (56.0)	ND (56.0)	107	135	ND (56.0)	ND (56.0)	14,600	73,000
Methyl Ethyl Ketone (2-Butanone)	2.24	2.12	7.43	3.19	3.54	8.14	2.36	2.36	106,000	530,000
Propene	865	594	211	311	968	1270	274	68.4	64,000	320,000
N-Propylbenzene	ND (1.60)	ND (1.60)	ND (1.60)	ND (1.60)	1.97	2.16	ND (1.60)	ND (1.60)	21,000	105,000
Styrene	1.36	1.19	1.7	1.19	1.87	2.04	0.85	1.53	21,000	105,000
Tetrachloroethene	ND (2.80)	ND (2.80)	ND (2.80)	ND (2.80)	4.34	4.07	ND (2.80)	ND (2.80)	840	4,200
Toluene	26.8	26.2	35.1	21.6	38	27.7	13	11	106,000	530,000
Trichlorofluoromethane (Freon 11)	1.12	1.12	3.6	1.12	2.47	12.6	1.12	1.12	14,600	73,000
1,2,4-Trimethylbenzene	1.18	0.98	0.98	ND (0.98)	1.57	1.57	1.18	ND (0.98)	1,260	6,300
O-Xylene	2.78	1.91	2.78	1.91	4.52	4.17	1.91	1.22	2,100	10,500
M- & P-Xylenes	7.64	5.73	7.3	5.39	12.7	10.3	5.56	3.47	2,100	10,500

Maryland Department of the Environment Land Restoration Program Vapor Intrusion Guidance Document. Published September 2019.

NP = The MDE has no published standard

ND (#) = Not Detected (Laboratory Detection Limit)

$\mu g/m^3$ = Parts per billion (micrograms per cubic meter)

August 2024 Conclusions

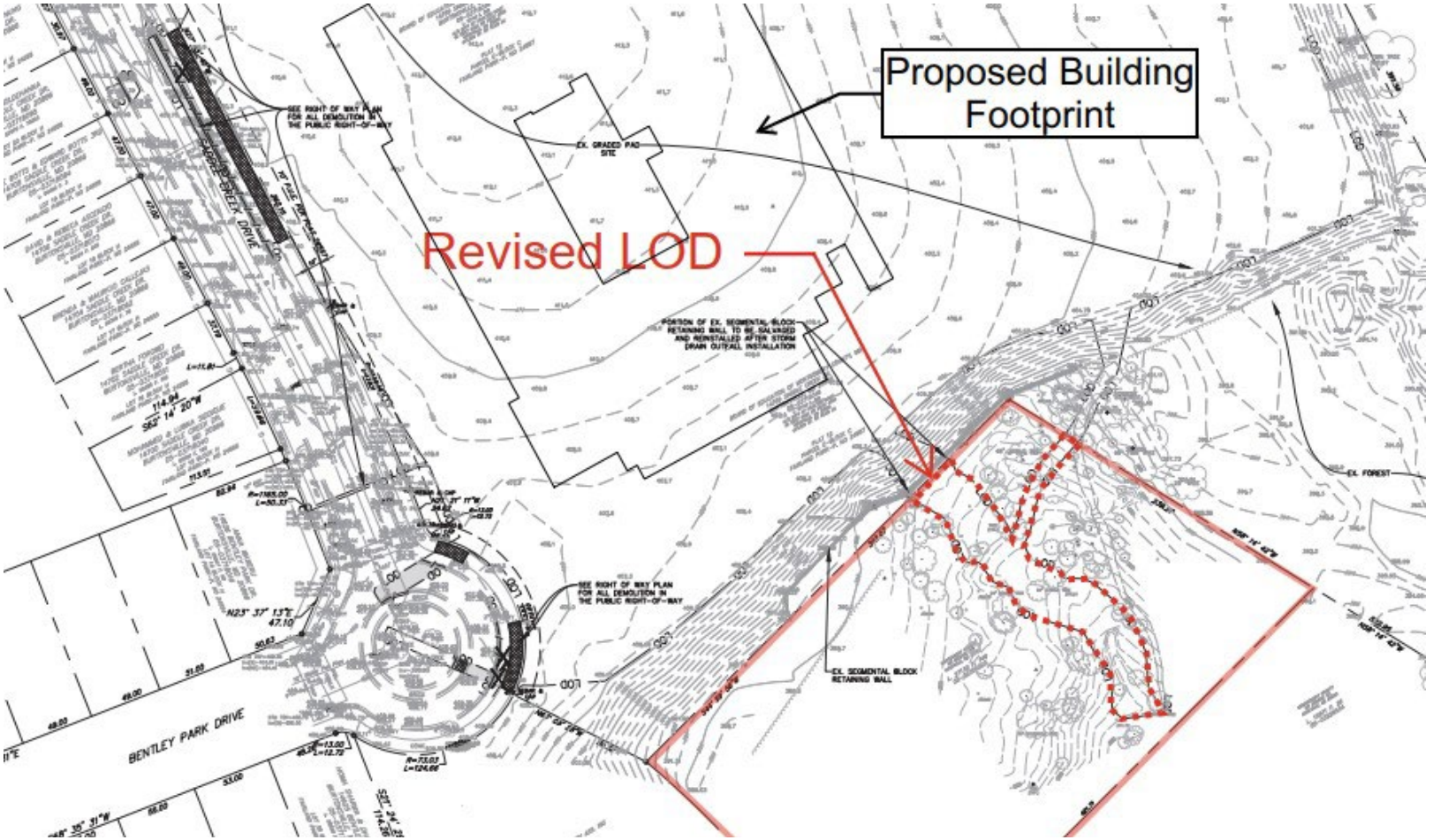
- Silica Exposure and Nuisance Dust Screening – This testing was performed based on a community concern raised about a nearby concrete recycling facility (within 0.25 miles). No detectable levels of silica or respirable dust were identified during the screening process.

- Volatile Organic Compound (VOC) Impact – Testing performed based on the recommendation from our previous report. Concentrations of Chloroform and 1,4-Dichlorobenzene exceeded the most stringent MDE screening levels in the soil vapor samples collected in the southwestern portion of the field.

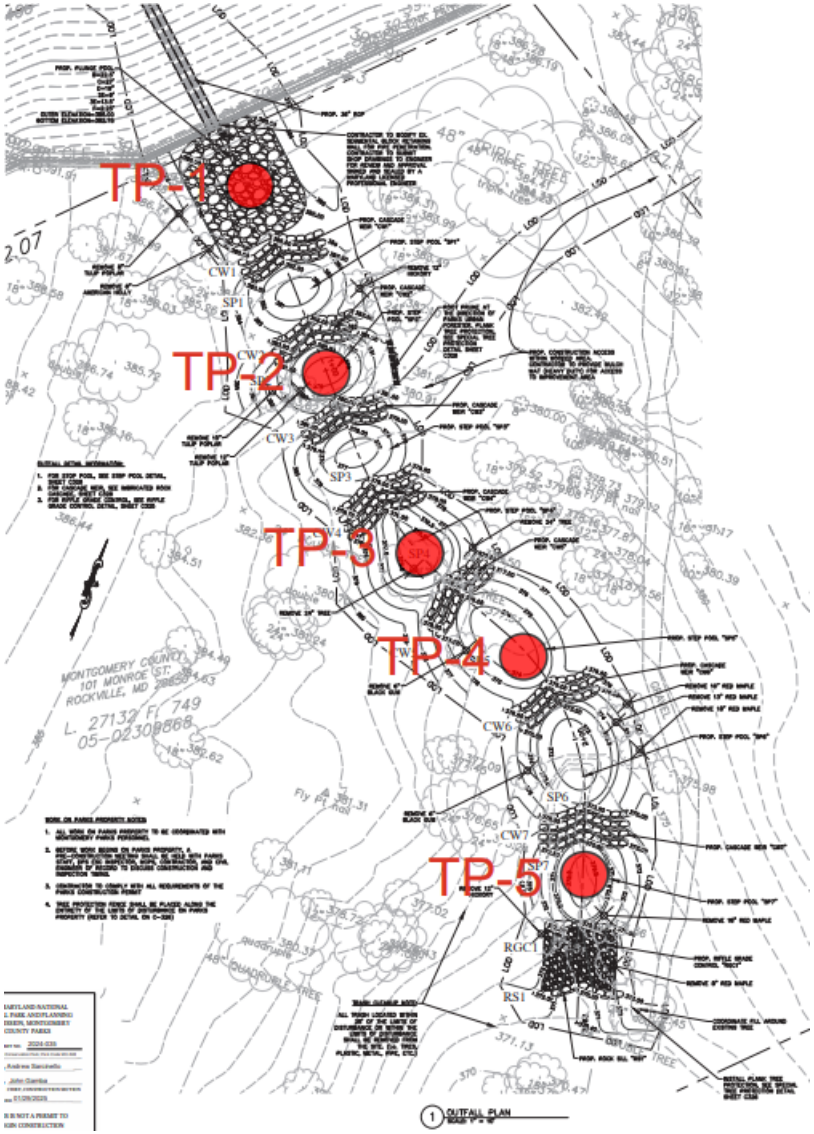
Action: ECS recommended that MCPS install a sub-slab vapor mitigation system to mitigate the potential for VOC vapors to collect within the completed building.

April 2025 Assessment

The Limit of Disturbance (LOD) was revised to include additional land for an outfall system.



April 2025 Conclusions

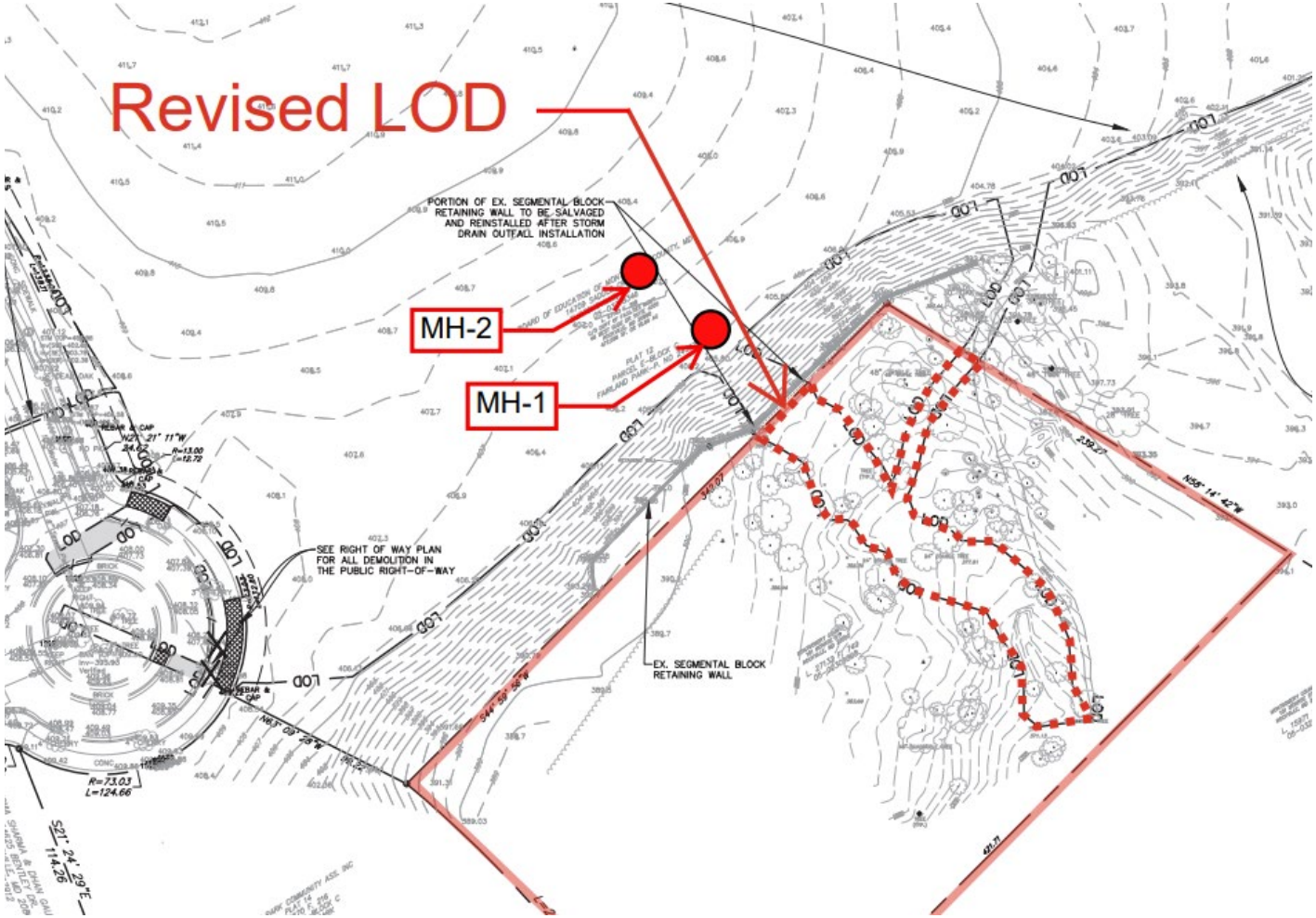


Five test pits were excavated along the proposed outfall system and soil samples were collected.

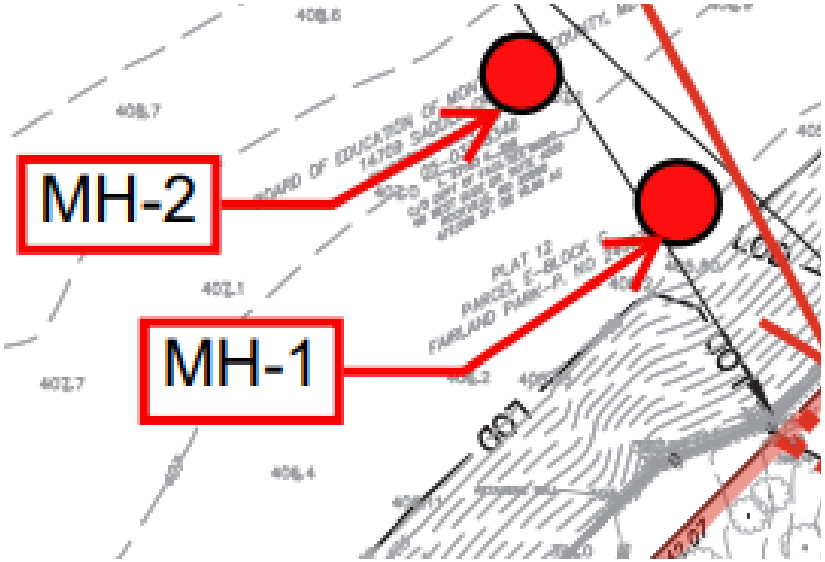
No exceedances of the most stringent MDE screening levels were identified in the soil samples collected during this sampling event.

May 2025 Assessment

An additional round of soil sampling associated with the outfall system was requested.



May 2025 Conclusions



The soil at two proposed manhole locations was excavated, and soil samples were collected from the excavations.

Again, no exceedances of the most stringent MDE screening levels were identified in the soil samples collected during this sampling event.

Known On-site Issues

- Hexavalent Chromium from 5 to 15 feet below surface grade in the wooded portion of the site.

- VOC vapor (Chloroform and 1,4-Dichlorobenzene) within the footprint of the proposed school structure.

Maryland
Department of the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary
Suzanne E. Dorsey, Deputy Secretary
Adam Ortiz, Deputy Secretary

February 28, 2025

Sent Via Electronic Mail

Mr. Nicholas Stella, Environmental Project Manager
ECS Mid-Atlantic, LLC
1340 Charwood Rd #A
Hanover, Maryland 21076
NStella@ecslimited.com

Re: Environmental Site Status Determination
Burtonsville Elementary School
14709 Saddle Creek Drive, Burtonsville, Maryland 20866

Dear Mr. Stella:

The Maryland Department of the Environment - Land Restoration Program (MDE-LRP) has reviewed the Phase I Environmental Site Assessment (ESA) Report, Phase II ESA Report, and Environmental Subsurface Evaluation Additional Sampling Report for the potential Burtonsville Elementary School property which details the work completed by ECS Mid-Atlantic, LLC (ECS) at 14709 Saddle Creek Drive, Burtonsville, Maryland (the Property). The three submitted reports describe the history and past land use of the site, as well as detailing general soil, groundwater, and soil vapor findings from across the site. Based on these results, MDE can determine that while there is contamination found onsite, the contamination is not high enough to demand MDE supervision or interference.

Conclusions/Recommendations

- The Hexavalent Chromium-impacted soil will remain undisturbed and capped below 5 feet of clean soil within the wooded portion of the property.
  - Typical MDE guidance requires a 2-foot cap of clean soil. As a result, we are above and beyond typical MDE requirements.
  - With the cap in place, there are no exposure pathways between site occupants and impacted soil.
  - The Hexavalent Chromium concentrations are only slightly above the conservative risk-based thresholds used by the MDE.
  - An operation and maintenance plan will be implemented to verify the integrity of the cap annually.

Conclusions/Recommendations

- The Chloroform and 1,4-Dichlorobenzene detected within the soil vapor will be mitigated by a sub-slab vapor mitigation system installed beneath the building.
  - Typical MDE guidance would only require monitoring of the indoor air. A vapor mitigation system goes above and beyond MDE guidance.
  - A vapor barrier installed beneath the slab of the building will be engineered to prevent VOCs from collecting within the building.
  - Piping will be installed beneath the vapor barrier/slab in order to safely vent subsurface VOCs above the roof of the building. (Similar to a radon system that you may have in your home.)
  - The indoor air will be tested following construction but before occupancy to verify the effectiveness of the system.
  - An operation and maintenance plan will be implemented to ensure the ongoing performance of the system.

Questions?