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## AVON LAKE GAS ADDITION PROJECT

### Archaeological Survey MapBook - Appendix A

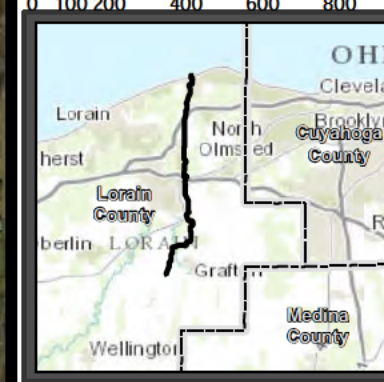
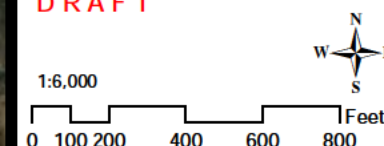
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- Political Township Boundary
- Municipal Boundary
- Railroad
- Roads
  - Interstate
  - US Highway
  - State Highway

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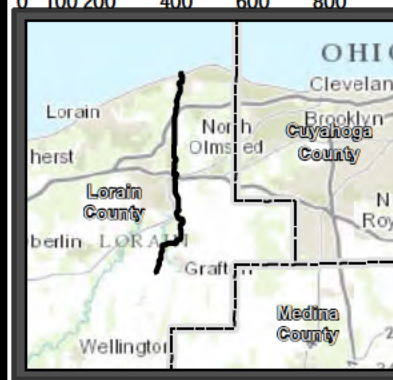
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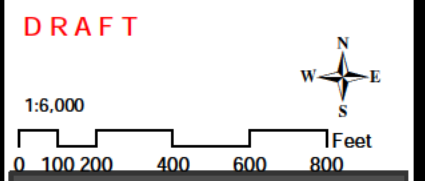
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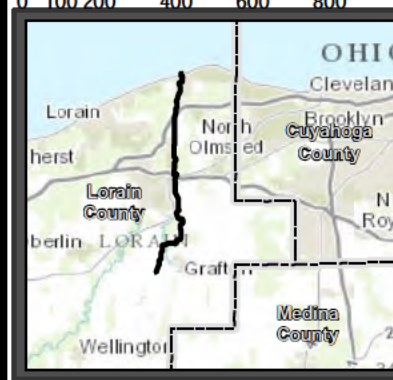
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## AVON LAKE GAS ADDITION PROJECT

### Archaeological Survey MapBook - Appendix A

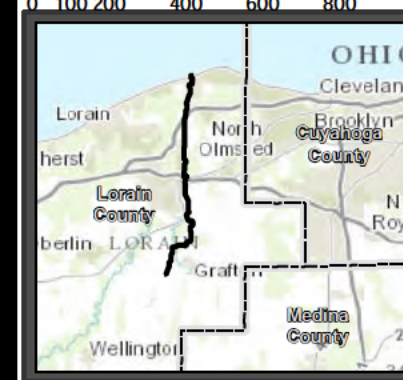
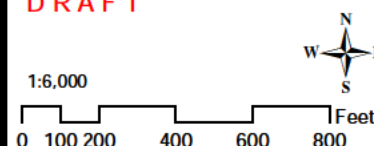
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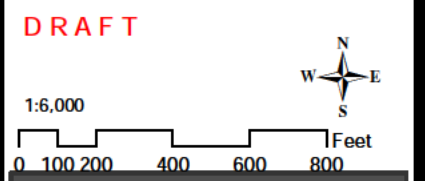
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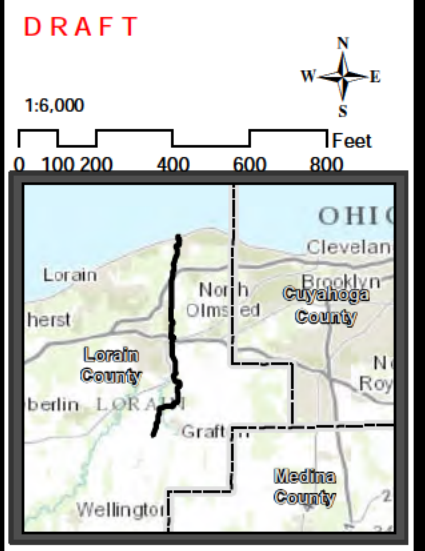
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Roads

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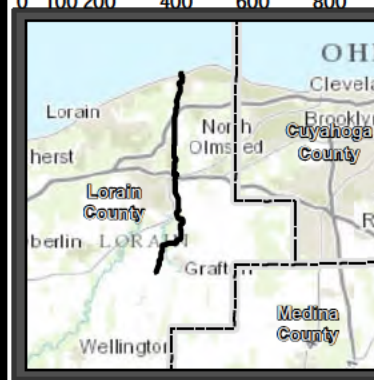
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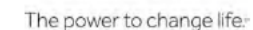
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**Boundaries**

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- Political Township Boundary
- Municipal Boundary

**Railroad**

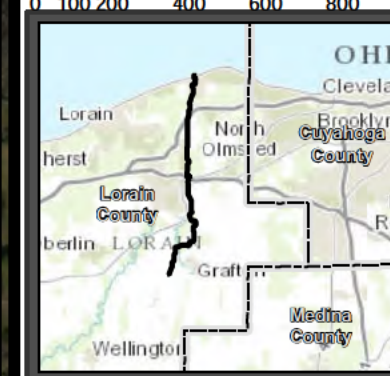
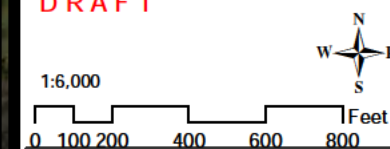
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**Roads**

- Interstate
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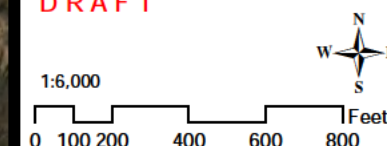
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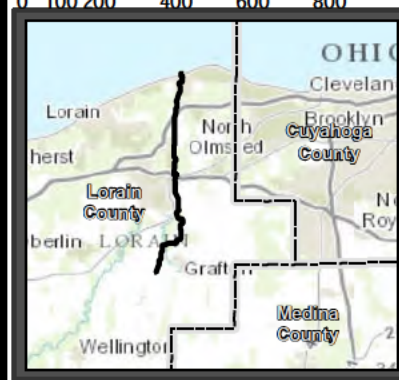
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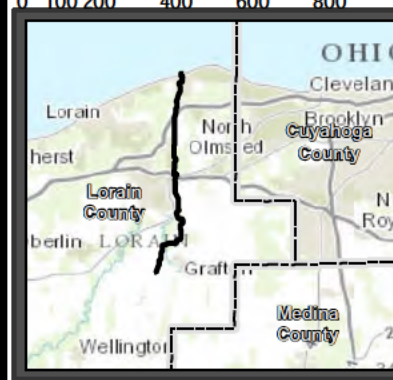
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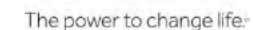
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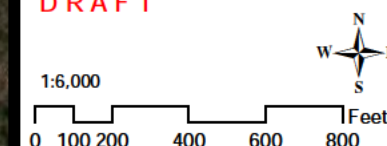
Railroad

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**Aerial Photo Source:** Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

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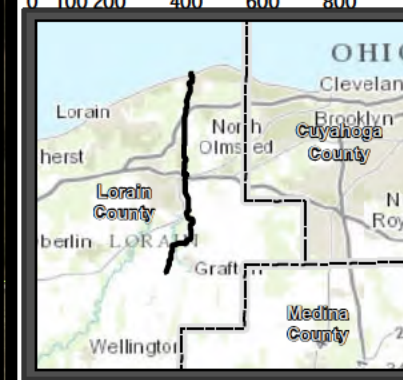
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## **APPENDIX B: ARCHAEOLOGICAL SHOVEL TESTING DESCRIPTIONS**

## Introduction

Soils and soil-forming processes are crucial links to understanding past landscapes and can have direct implications for archaeological understanding of precontact through post-contact land use. For these reasons, this section serves the purpose of 1) identifying soil series in shovel tested areas; 2) describing the soil parent material, typical landforms on which these soil series form, and the precontact vegetation within these areas; and 3) describing the field results from these shovel tests including current land use/vegetation, methods and size of area tested, descriptions of soil horizons encountered, and whether or not archaeological material was recovered. For a better understanding of these results, a brief summary of soil forming processes and soil horizons is presented below.

Most soils exhibit some horizonation, or genetic layering that distinguishes them from sediments, such as sand on a beach. The formation of horizons by pedogenic or soil forming processes dictate that over time certain horizons will take on unique functions and characteristics that set it apart from the horizons above and below. The rate and intensity to which these soil horizons form can be linked to five factors: 1) climate; 2) plant and animal activity; 3) parent material; 4) topographic position; and 5) time. Factors such as climate and plant and animal activity determine how much and when important inputs such water and organic materials can enter or be taken out of the soil. Other factors such as parent material determine the original mineral makeup of the soil which can affect the overall soil productivity in terms of plant and animal life. Topographic position as a soil-forming factor largely affects the movement of groundwater and also has a direct effect on plant and animal life. The last soil-forming factor, time, indicates that soils forming on landscapes that have been stable for longer geological periods, such as level upland locations, will have more developed horizonation versus soils forming on unstable, geologically young landscapes, such as floodplains and beaches.

### *Shovel Test Area AV57.3*

The United States Department of Agriculture to Natural Resources Conversation Service (USDA-NRCS) Soil Survey Division recognizes two soil series within Shovel Test Area AV57.3 (USDA-NRCS Soil Survey Staff 2014). The Miner series consists of very deep, very poorly drained soils formed in low-lime glacial till principally derived from acid shale on lake plains and till plains. Permeability is slow. Slopes range from 0 to 2 percent. Native vegetation is dominated by elm, soft maple, and ash. The Mahoning series consists of very deep somewhat poorly drained soils formed in till on till plains. Saturated hydraulic conductivity is moderately low in the subsoil and moderately low or low in the underlying material. Slope ranges from 0 to 15 percent. Native vegetation includes oaks, sugar maple, tulip poplar, ash, and beech.

At the time of the archaeological survey manicured grasses reduced the surface visibility of the area to less than five percent (Appendix A: Map 4). A relatively flat upland overlooking French Creek to the east was considered to have a high potential for containing buried prehistoric archaeological resources if the area proved to remain

undisturbed. As a result, five shovel tests at 15-m (49-ft) to 45-m (147-ft) intervals were conducted to assess if the area remained undisturbed (Shovel Test Area AV57.3). Little soil was identified within the excavated shovel test. Rather the area was found to contain a deposit of ash, slag, asphalt, gravel, and other similar materials associated with local industry. Anecdotal information provided by the Project's land agents confirmed that the area had previously been the dump site for local industrial fly-ash deposits. No archaeological materials were encountered in this area.

*Shovel Test Area AV96 (33LN0278)*

The USDA to NRCS Soil Survey Division recognizes one soil series within Shovel Test Area AV96 (USDA-NRCS Soil Survey Staff 2014). The Mahoning series consists of very deep somewhat poorly drained soils formed in till on till plains. Saturated hydraulic conductivity is moderately low in the subsoil and moderately low or low in the underlying material. Slope ranges from 0 to 15 percent. Native vegetation includes oaks, sugar maple, tulip poplar, ash, and beech.

At the time of survey, the area exhibited deciduous woodland vegetation providing little to no surface visibility (see Figures 3, 4, and 5; Appendix A: Map 8). Pedestrian survey was conducted at 10-m intervals across this portion of the Survey Area; however, no artifacts or features were identified. Due to the poor surface visibility shovel testing was conducted at 15-m intervals (Shovel Test Area AV96). Nine shovel tests were placed at 15-m intervals within this portion of the Survey Area. One shovel test was found to contain archaeological resources. Shovel test 3 contained one piece of shatter of an indeterminate chert material at 0 to 10 cmbs. Additional shovel tests were excavated at 5-meter intervals in all four cardinal directions from the positive test until two consecutive negative tests were encountered in all directions. No additional archaeological resources were identified.

A total of 17 shovel tests were excavated within this portion of the Survey Area. Soils were moderately well developed revealing two layers, and were excavated to an average depth of 29 cmbs. The initial layer consisted of silt clay soil and ranged in color from very dark grayish brown (10YR3/2) to brown (10YR4/3). The initial layer extended to depths ranging from 6 to 30 cmbs overlying a second layer consisting of dark grayish brown (10YR4/2) to light brownish gray (10YR6/2) clay mottled by yellowish brown (10YR5/6) to brownish yellow (10YR6/6) clay oxidation channels. A boundary was drawn around a 5-m buffer of the single positive shovel test (see Figure 5). The 0.02-acre area was designated Site 33LN0278.

*Shovel Test Area AV125 (Site 33LN0279)*

The USDA to NRCS Soil Survey Division recognizes one soil series within Shovel Test Area AV125 (USDA-NRCS Soil Survey Staff 2014). The Fitchville series consists of very deep, somewhat poorly drained soils formed in stratified Wisconsinan age glaciolacustrine sediments on lake plains and slackwater terraces. Permeability is moderate in the surface, moderately slow in the subsoil and moderate or moderately slow

in the substratum. Slope ranges from 0 to 12 percent. Native vegetation includes sugar maple, beech, red oak, pin oak, elm, and hickory.

At the time of survey, the area exhibited deciduous woodland/wetland vegetation providing little to no surface visibility (see Figures 3, 6, 7, and 8; Appendix A: Map 11). The area exhibited very wet conditions and appeared to be a wetland environment. Pedestrian survey was conducted at 10-m intervals across this portion of the Survey Area, which led to the discovery of a well shaft feature and an associated system of drainage ditches. The well shaft feature and the associated system of drainage ditches were mapped within the Survey Area, though the drainage system appears to extend to the east beyond the Survey Area. Due to the poor surface visibility four shovel tests set at 5-m intervals in all four cardinal directions from the well shaft feature were excavated (Shovel Test Area AV125). All four shovel tests were negative for archaeological material and all four exhibited soils indicative of a wetland environment.

The soils were moderately well developed revealing two layers, and were excavated to an average depth of 41 cmbs. The initial layer consisted of silt clay to clay soil and ranged in color from very dark grayish brown (10YR3/2) to dark gray (10YR4/1). The initial layer extended to depths ranging from 15 to 39 cmbs overlying a second layer consisting of gray (10YR6/1) to light brownish gray (10YR6/2) clay mottled by yellowish brown (10YR5/6) to brownish yellow (10YR6/6) clay oxidation channels. A boundary was drawn around historic-period features identified within the Survey Area (see Figure 8). The 2.12-acre area was designated Site 33LN0279.

*Shovel Test Area AV167 (Site 33LN0076)*

The USDA to NRCS Soil Survey Division recognizes two soil series within Shovel Test Area AV167 (USDA-NRCS Soil Survey Staff 2014). Saturated hydraulic conductivity is moderately low in the subsoil and moderately low or low in the underlying material. Slope ranges from 0 to 15 percent. Native vegetation includes oaks, sugar maple, tulip poplar, ash, and beech. The Trumbull series consists of deep, poorly drained soils formed in low-lime glacial till. These soils have slow to very slow permeability. Slope gradients range from 0 to 6 percent. Native vegetation includes elm, soft maple, pin oak, and ash. The Mahoning series consists of very deep somewhat poorly drained soils formed in till on till plains.

At the time of survey, the portion of 33LN0076 intersected by the Survey Area fell within two separate agricultural fields (see Figures 3, 22, and 23; Appendix A: Map 14). The majority of the intersected portion of the site fell within a relatively flat open field exhibiting tall grassland vegetation which allowed for little to no surface visibility. A very small portion of 33LN0076 intersected by the Survey Area fell within an actively cultivated agricultural field exhibiting remnant soybean detritus from the previous season as well as weed growth, which allowed for 55 to 65 percent ground surface visibility.

Pedestrian survey was conducted at 5-m intervals across the entire portion of 33LN0076 intersected by the Survey Area. No artifacts or features were identified. Due to the poor

surface visibility within the agricultural field exhibiting tall grassland vegetation, the entire portion of 33LN0076 intersected by the Survey Area and falling within the field exhibiting tall grassland vegetation was shovel tested at 15-m intervals (Shovel Test Area AV167).

Fifty shovel tests were placed at 15-m intervals within the portion of 33LN0076 intersected by the Survey Area. Two shovel tests were found to contain archaeological resources. Shovel test 12 contained one complete flake of an indeterminate chalcedony material at 20 to 30 cmbs. Shovel test 14 contained one piece of shatter of a material comparable to Onondaga chert at 10 to 20 cmbs. Additional shovel tests were excavated at 5-meter intervals in all four cardinal directions from each positive test until two consecutive negative tests were encountered in all directions. No additional archaeological resources were identified.

A total of 66 shovel tests were excavated within the portion of 33LN0076 intersected by the Survey Area. Soils were moderately well developed revealing two layers, and were excavated to an average depth of 39 cmbs. The initial layer (Ap horizon) consisted of silt and clay silt soil and ranged in color from dark grayish brown (10YR4/2) to brown (10YR5/3). The Ap horizon extended to depths ranging from 20 to 36 cmbs overlying a second layer consisting of dark gray (10YR4/1) to light brownish gray (10YR6/2) clay mottled by dark yellowish brown (10YR4/6) to yellowish brown (10YR5/8) clay oxidation channels. The location and dimensions of the 38.29-acre site area previously reported as 33LN0076 were not altered or modified based on the current survey results.

#### *Shovel Test Area AV183*

The USDA to NRCS Soil Survey Division recognizes one soil series within Shovel Test Area AV183 (USDA-NRCS Soil Survey Staff 2014). The Mahoning series consists of very deep somewhat poorly drained soils formed in till on till plains. Saturated hydraulic conductivity is moderately low in the subsoil and moderately low or low in the underlying material. Slope ranges from 0 to 15 percent. Native vegetation includes oaks, sugar maple, tulip poplar, ash, and beech.

At the time of the archaeological survey grassland vegetation reduced the surface visibility of the area to less than five percent (Appendix A: Map 15). A small ridge overlooking Hill Ditch to the north was considered to have a high potential for containing buried prehistoric archaeological resources. As a result, six shovel tests at 15-m (49-ft) intervals were conducted focusing on elevated area overlooking the stream (Shovel Test Area AV183). Soils were moderately developed revealing two horizons and were excavated to an average depth of 36 cmbs. The initial horizon consisted of silt loam to clay silt ranging in color from dark grayish brown (10YR4/2) to brown (10YR5/3) and extended to depths of 22 to 30 cmbs. The subsoil, excavated to depths of 30 to 65 cmbs, consisted of grayish brown (10YR5/2) to light brownish gray (10YR6/2) clay exhibiting brownish yellow (10YR6/6) oxidation staining. No archaeological materials were encountered in this area.

*Shovel Test Area 197 (Site 33LN0280)*

The USDA to NRCS Soil Survey Division recognizes two soil series within Shovel Test Area AV197 (USDA-NRCS Soil Survey Staff 2014). The Bogart series consists of very deep, moderately well drained soils that formed in stratified outwash deposits on terraces, beach ridges, and outwash plains. Permeability is moderate or moderately rapid in the solum and rapid in the substratum. Slopes range from 0 to 12 percent. Native vegetation includes sugar maple, beech, and oak. The Haskins series consists of very deep, somewhat poorly drained soils that are moderately deep or deep to dense till. They formed in loamy water-sorted or glaciolacustrine material 51 to 102 cm (20 to 40 inches) thick and in the underlying till. These soils are on lake plains and till plains. Slope ranges from 0 to 6 percent. Native vegetation is deciduous, mixed hardwood forest.

At the time of survey, the area exhibited soy detritus from the previous season and very heavy weed growth, which limited the surface visibility to less than five percent (see Figures 3, 12, and 13; Appendix A: Map 17). Pedestrian survey was conducted at 10-m intervals across this portion of the Survey Area; however, no artifacts or features were identified. Due to the poor surface visibility shovel testing was conducted at 15-m intervals (Shovel Test AV197). Twelve shovel tests were placed at 15-m intervals within this portion of the Survey Area. One shovel test was found to contain archaeological resources. Shovel test 3 contained one complete overshot flake of a material comparable to Onondaga chert at 20 to 30 cmbs. Additional shovel tests were excavated at 5-meter intervals in all four cardinal directions from the positive test until two consecutive negative tests were encountered in all directions to delineate the site boundary. During the site delineation process, four more positive shovel tests were excavated before two consecutive negative shovel tests at 5-m intervals were encountered in all four cardinal directions from all positive tests. Shovel test 14 contained one complete flake of Flint Ridge chert at 0 to 10 cmbs. Shovel test 15 contained one complete bifacial preform crafted of a material comparable to Onondaga chert at 20 to 30 cmbs (see Figure 14). Shovel test 25 contained on piece of shatter of an indeterminate chert material at 0 to 10 cmbs and shovel test 29 contained one proximal flake of an indeterminate chert material at 0 to 10 cmbs. No additional archaeological materials were identified at Site 33LN0280 beyond the five lithic artifacts discussed above.

A total of 32 shovel tests were excavated within this portion of the Survey Area. Soils were moderately well developed revealing two layers, and were excavated to an average depth of 27 cmbs. The initial layer (Ap horizon) consisted of silt loam soil and ranged in color from dark brown (10YR3/3) to dark grayish brown (10YR4/2). The initial layer extended to depths ranging from 19 to 40 cmbs overlying a second layer consisting of brown (10YR4/3) to dark yellowish brown (10YR4/6) sandy silt to sandy clay. A boundary was drawn around a 5-m buffer of the positive shovel test units (see Figure 12). The 0.09-acre area was designated Site 33LN0280.



*Shovel Test Area AV208 (Site 33LN0281)*

The USDA to NRCS Soil Survey Division recognizes one soil series within Shovel Test Area AV208 (USDA-NRCS Soil Survey Staff 2014). The Mahoning series consists of very deep somewhat poorly drained soils formed in till on till plains. Saturated hydraulic conductivity is moderately low in the subsoil and moderately low or low in the underlying material. Slope ranges from 0 to 15 percent. Native vegetation includes oaks, sugar maple, tulip poplar, ash, and beech.

Shovel Test Area AV208 consists of an actively cultivated agricultural field exhibiting relatively flat topography (Figures 3, 16, 17, and 18; Appendix A: Map 18). During the pedestrian survey, a sparse lithic surface scatter consisting of one biface fragment crafted of a material comparable to Coshocton or Onondaga chert as well as one piece of shatter and one complete flake of an indeterminate chert was identified on the ground surface. At the time of survey the site area exhibited remnant soybean detritus from the previous season, which allowed for 75 to 85 percent ground surface visibility. Pedestrian survey was conducted at 1-m intervals within a 30 m buffer of the find spot; however, no additional material was identified on the surface beyond the three lithic artifacts discussed above.

Due to excellent surface visibility, two shovel tests were excavated at the find spot to assess soil stratigraphy at the location and check for the presence of buried archaeological deposits (Shovel Test Area AV208). No additional archaeological resources were identified. Soils were moderately well developed revealing two layers, and were excavated to an average depth of 26 cmbs. The initial layer (Ap horizon) contained brown (10YR4/3) silt loam to silt clay soil. The Ap horizon extended to an average depth of 37 cmbs overlying a second layer of grayish brown (10YR5/2) clay mottled by yellowish brown (10YR5/6) clay oxidation channels. A boundary was drawn around a 5-m buffer of the surface find locations (see Figure 16). The 0.16-acre area was designated Site 33LN0281.

*Shovel Test Area AV216.2 (Site 33LN0282)*

The USDA to NRCS Soil Survey Division recognizes one soil series within Shovel Test Area AV216.2 (USDA-NRCS Soil Survey Staff 2014). The Mahoning series consists of very deep somewhat poorly drained soils formed in till on till plains. Saturated hydraulic conductivity is moderately low in the subsoil and moderately low or low in the underlying material. Slope ranges from 0 to 15 percent. Native vegetation includes oaks, sugar maple, tulip poplar, ash, and beech.

Shovel Test Area AV216.1 consists of a relatively flat, actively cultivated agricultural field located west of Dent Ditch (see Figures 3, 19, 20, and 21; Appendix A: Map 19). During the pedestrian survey, an isolated lithic artifact fashioned out of a material comparable to Coshocton or Onondaga chert was identified on the ground surface. At the time of survey the site area exhibited remnant soybean detritus from the previous season as well as weed growth, which allowed for 55 to 65 percent ground surface visibility.

Pedestrian survey was conducted at 1-m intervals within a 30 m buffer of the find spot; however, no additional material was identified on the surface.

Due to excellent surface visibility, a single shovel test was excavated at the find spot to assess soil stratigraphy at the location and check for the presence of buried archaeological deposits (Shovel Test Area AV216.2). No additional archaeological resources were identified. Soils were moderately well developed revealing two layers, and were excavated to a depth of 35 cmbs. The initial layer (Ap horizon) contained brown (10YR5/3) silt loam to silt clay soil. The Ap horizon extended to a depth of 25 cmbs overlying a second layer of grayish brown (10YR5/2) clay mottled by dark yellowish brown (10YR4/6) clay oxidation channels. A boundary was drawn around a 5-m buffer of the surface find location (see Figure 19). The 0.02-acre area was designated Site 33LN0282.

## **APPENDIX C: ARTIFACT CATALOG**

Avon Lake Gas Addition Project  
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**33LN0278**

State Site No.	Field No.	Provenience	Depth (cmbs)	Bag No.	Catalog No.	Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Period	Class	Type	Morphology1	Material
33LN0278	AV96-1	ST 3	0-10	1	1.1	0.1	10.4	5.5	2.4	Prehistoric	Lithic; Chipped Stone	Debitage	Shatter	Indeterminate Chert

**33LN0280**

State Site No.	Field No.	Provenience	Depth (cmbs)	Bag No.	Catalog No.	Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Period	Class	Type	Morphology1	Material
33LN0280	AV197-1	ST 3	20-30 cmbs	1	1.1	5.1	41.67	28.88	10.18	Prehistoric	Lithic; Chipped Stone	Debitage	CompFlake	cf. Onondaga Chert
33LN0280	AV197-1	ST 14	0-10 cmbs	2	2.1	4.8	26.05	22.68	10.63	Prehistoric	Lithic; Chipped Stone	Debitage	CompFlake	Flint Ridge Chert
33LN0280	AV197-1	ST 15	20-30 cmbs	3	3.1	22.2	56.17	36.18	12.36	Prehistoric	Lithic; Chipped Stone	Tool	CompBiface	cf. Onondaga Chert
33LN0280	AV197-1	ST 25	0-10 cmbs	4	4.1	1.4	18.08	11.45	6.22	Prehistoric	Lithic; Chipped Stone	Debitage	Shatter	Indeterminate Chert
33LN0280	AV197-1	ST 29	0-10 cmbs	5	5.1	0.6	19.83	17.87	1.76	Prehistoric	Lithic; Chipped Stone	Debitage	ProxFlake	Indeterminate Chert

**33LN0281**

State Site No.	Field No.	Provenience	Depth (cmbs)	Bag No.	Catalog No.	Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Period	Class	Type	Morphology1	Material
33LN0281	AV208-1	SF 1	Surface	1	1.1	3.0	25.50	18.96	5.00	Prehistoric	Lithic; Chipped Stone	Tool	Biface	cf. Coshocton Chert
33LN0281	AV208-1	SF 2	Surface	2	2.1	7.3	29.13	27.09	10.75	Prehistoric	Lithic; Chipped Stone	Debitage	Shatter	Indeterminate Chert
33LN0281	AV208-1	SF 3	Surface	3	3.1	1.0	16.18	16.98	3.56	Prehistoric	Lithic; Chipped Stone	Debitage	CompFlake	Indeterminate Chert

Avon Lake Gas Addition Project  
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**33LN0282**

State Site No.	Field No.	Provenience	Depth (cmbs)	Bag No.	Catalog No.	Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Period	Class	Type	Morphology1	Material
33LN0282	AV216.2-1	SF 1	Surface	1	1.1	24.9	55.7	40.5	8.5	Prehistoric	Lithic; Chipped Stone	Tool	CompFlakeTool	cf. Coshocton Chert

**33LN0076**

State Site No.	Field No.	Provenience	Depth (cmbs)	Bag No.	Catalog No.	Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Period	Class	Type	Morphology1	Material
33LN0076	AV167-1	ST 14	10-20 cmbs	1	1.1	0.2	11.51	7.88	2.19	Prehistoric	Lithic; Chipped Stone	Debitage	Shatter	cf. Onondaga Chert
33LN0076	AV167-1	ST 12	20-30 cmbs	2	2.1	0.2	12.93	8.81	1.89	Prehistoric	Lithic; Chipped Stone	Debitage	CompFlake	Indeterminate Chalcedony

## **APPENDIX D: PROJECT PERSONNEL**

## **LIST OF PERSONNEL**

### Principal Investigators

Andrew Bielakowski, M.A., RPA  
Mark Doperalski, M.A., RPA

### Field Archaeologists

#### Field Directors

Mark Doperalski, M.A., RPA  
Kyle Spurgeon, M.A.

#### Field Technicians

Ryan Lisson, B.S.  
Aaron Gordon, B.S.  
Frank Koep, B.A.

### Graphics and GIS

Jason Sphar, B.A.



**This foregoing document was electronically filed with the Public Utilities**

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Summary: Application of NRG Ohio Pipeline Company LLC continued - Attachment C (Part 4)  
electronically filed by Teresa Orahod on behalf of Sally Bloomfield