Construction Options at U.S. 42 and the Drumanard Estate Historic District

In 2003, the Federal Highway Administration (FHWA) approved the Final Environmental Impact Statement (FEIS), Section 4(f) Evaluation, and Record of Decision (ROD) for the Louisville-Southern Indiana Ohio River Bridges Project (LSIORBP). A careful balancing of numerous environmental, community, and transportation factors led to the identification of the Selected Alternative: Alternative C-1 (Downtown), Alternative A-15 (Far East), and the Kennedy Interchange Reconstruction to the South.

Through the *Metropolitan Transportation Plan* (MTP) update process in 2010, the newly created Louisville and Southern Indiana Bridges Authority (Bridges Authority), the Kentucky Transportation Cabinet (KYTC) and the Indiana Department of Transportation (INDOT) determined that traditional funding sources were likely to be insufficient to cover the estimated cost of the Selected Alternative and that toll-based revenues had the potential to provide sufficient funding capacity to cover the shortfall. KYTC and INDOT recognized during that process that a supplemental environmental impact statement (SEIS) under the National Environmental Policy Act (NEPA) would be required – even if there were no changes to the project design – because the introduction of tolling would have the potential to cause environmental impacts that were not evaluated during the original NEPA process.

Kentucky Governor Steve Beshear and Indiana Governor Mitch Daniels directed KYTC and INDOT to evaluate cost saving modifications to the Selected Alternative that could reduce the amount of toll-based revenue needed to cover the funding shortfall. The leaders requested that the transportation agencies consider modernizing the Kennedy Interchange in-place rather than rebuilding it to the south; reducing the east end bridge and its approaches from six to four lanes while providing the ability to expand to six lanes when traffic demand warrants; and eliminating the pedestrian/bikeway facility from the new downtown bridge since both states had programmed the conversion of the Big Four Bridge (a former railroad bridge) to a pedestrian/bikeway facility in the downtown area as a separate project.

During the MTP update, the Bridges Authority's financial analysis estimated that inflation costs alone result in an increase of $7 million per month in project costs. The potential cost saving measures identified by KYTC and INDOT have the potential to lessen the environmental impacts of the project and reduce the amount of inflation the project is subjected to, while not significantly affecting the project implementation schedule (including the time to complete the SEIS under NEPA). KYTC and INDOT have estimated that these measures, along with reconfiguration of interchanges on the downtown approach in Indiana, would reduce the cost of the project by approximately $1.2 billion. This modified version of the Selected Alternative is currently estimated at a non-inflated cost of $2.37 billion with an inflated cost of $2.9 billion (assuming the same project schedule identified during the MTP update). The "inflated cost" is the cost of the project as expressed in year-of-expenditure dollars, which takes into account the effects of inflation.

A major cost element of the project that currently remains as part of the Selected Alternative is a tunnel under US42 and the Drumanard Estate Historic District. The 2003 ROD included a commitment to construct a tunnel in this location as a means of avoiding the use of the Drumanard Estate Historic District, which is protected under Section 4(f) of the U.S. Department of Transportation Act, a federal law that protects historic properties and parklands. The 2003 ROD did not specify the construction methods for the tunnel, nor was the construction method specified in the FEIS, Section 4(f) Evaluation,

or Section 106 Memorandum of Agreement (MOA) for the project. The cost estimates that were developed for the Engineering Report, which was included in the FEIS and presented to the public at the public hearings, assumed a "bored shaft" tunnel would be constructed underneath US42 and the Drumanard Estate Historic District. The portion of the tunnel that would be located under the Drumanard Historic Estate is approximately 1,200 feet in length. The total length of the tunnel is approximately 1,940 feet.

The purpose of this analysis is to consider whether alternative construction techniques or reconsideration of that original decision in favor of a bored shaft tunnel should be pursued. This analysis was prepared at the request of FHWA to provide quantitative and qualitative information regarding the possibility of reducing project costs by using a different construction method at the crossing of US 42 and the Drumanard Estate. This analysis was intended to assist KYTC, INDOT, and FHWA in deciding whether any alternative construction method in this location warrants additional study in the SEIS. The following construction methods are discussed in this report:

- A "bored shaft tunnel" method. In this "bored shaft" method, the lateral tunnel shaft is constructed by underground drilling and controlled underground blasting without any surface disturbance. The 2011 construction cost of the tunnel is estimated at $255 million (non-inflated). The 2011 estimate for the KY approach to the East End Bridge, including the tunnel, is $509.2 million (non-inflated). The tunnel would require the placement of permanent easements on the surface above the tunnel for operation and maintenance purposes. The operation and maintenance cost of the tunnel is estimated to average $1.5 million annually. It would take approximately three to four years to construct the tunnel using the bored shaft method. No major changes relevant to the predicted impacts of the bored shaft tunnel at US42 and the Drumanard Estate Historic District are anticipated as a result of the proposed modifications being evaluated in the current SEIS process, except for the potential narrowing of the tunnel as a result of the reduction in travel lanes from six to four. Thus, KYTC concludes that the original findings in the FEIS and ROD remain valid for this construction technique.

- A "cut and cover tunnel" method. This method involves the excavation of an open trench in which the tunnel structure would be constructed and then covered with the excavated material. Using a cut and cover method for the tunnel in lieu of the bored shaft method would result in a savings to the KY Approach to the East End Bridge of $82 million, resulting in a non-inflated approach cost of $427.2 million. The tunnel would require the placement of permanent easements on the surface above the tunnel for operation and maintenance purposes. The operation and maintenance cost of the tunnel is estimated to average $1.5 million annually. The construction of the tunnel using a cut and cover method would take approximately two to three years.

- An "open cut" method. This method involves the excavation of an open trench with the roadway constructed at the bottom of the open trench. The trench would remain open after construction. This type of construction would require permanent right-of-way acquisition. Using an open cut construction in lieu of bored shaft tunnel would result in a savings of $203.7 million to the KY Approach to the East End Bridge, resulting in a non-inflated approach cost of $305.5 million. The operation and maintenance cost of the open cut is estimated to average $500,000 annually. An open cut would require approximately one to two years to construct.

1. Overview of the Project Area

The US42 corridor connects the City of Prospect to the City of Louisville in eastern Jefferson County near Oldham County. The FEIS indicated Oldham County was the fastest growing county in the region between 1980 and 2000 (See FEIS 4-4 Table 4.1-1) and had the highest per capita income in both 1989 and 1999 (See FEIS 4-5 Table 4.1-3). Alternative A-15 crosses US42 just south of the City of Prospect in an area between Wolf Pen Branch Road and Harrods Creek, running parallel with each. The corridor is dotted with well-established residential developments such as Bridgepointe and the Harbors at Harrods Creek. The Drumanard Estate Historic District, listed in the National Register of Historic Places (NRHP), and the Allison-Barrickman House, an NRHP-eligible property, are also located in the vicinity. The Drumanard Estate Historic District is also considered a contributing element of the larger Country Estates of River Road Historic District.

The Country Estates of River Road Historic District consists of all or portions of a string of contiguous estates, many with designed landscapes, covering approximately 729.4 acres northeast of Louisville. The Drumanard Estate Historic District is a representation of the Country Estate property type in the suburban development context.

The Drumanard Estate Historic District includes a historic landscape designed by the nationally known firm of Olmsted Associates and a formal garden designed by Arthur Cowell of Pennsylvania. While the original plantings have matured, and in some cases are in serious decline, the original design concepts are recognizable. The property includes a Tudor Revival style architectural cluster, one of several such examples by the locally prominent firm of Nevin and Morgan. The dwelling at Drumanard was listed on the NRHP in 1983. The boundary of the Drumanard Estate Historic District was later expanded by the Keeper of the Register based on an amended nomination to include the entire 42-acre estate. The Drumanard Estate Historic District was listed on the NRHP under Criterion C for the architectural significance of the above-ground resources.

The Allison-Barrickman property features an intact example of a modified Greek Revival House, unique to Jefferson County. Built in 1844, the house is a one and one-half story, five-bay, front gabled frame structure that rests upon a stone foundation. The property also features a dairy barn and silo dated to 1918. North of the barn area is a family and slave cemetery. To the east of the house are farm outbuildings and an icehouse ruin. The property is considered eligible for the NRHP under Criterion C.

The alignment of Alternative A-15 east of US42 passes between, and is adjacent to, the Allison-Barrickman property (to the south) and the Bridgepointe Subdivision (to the north), and Alternative A-15 passes through the Drumanard Estate Historic District west of US42 (See Attachment A).

In the area of the tunnel, the Drumanard Estate Historic District is primarily wooded with a tributary to Harrods Creek running through the property. A landscaping plan for the site was developed by Olmsted Associates with a primary focal point being this tributary. This area has not been highly maintained and there is no evidence that the Olmsted Landscape Plan was ever implemented in this wooded area. A survey of the trees within the limits of Alternative A-15 was conducted by Robert Rollins, an arborist recommended by the Olmsted Conservancy. The arborist concluded there were no trees that were originally planted in accordance with the Olmsted landscape plan remaining within the area (See Attachment B).

Christine Amos, of Amos Consulting Group, reviewed the property in 2010 and prepared a report titled *Easement Baseline Documentation of the Drumanard Estate* (See Attachment C). In this report, Ms. Amos writes:

> "The woods to the rear of the property, north of the gardener's cottage and shed, were identified in the 1988 and 1998 nominations as a contributing historic site. While this area is part of the original Drumanard parcel, the area's historic use was as crop land and pasture. The 1937 aerial shows it is alternating forest, pasture, and crop fields from the north and west of the gardener's building area. Today the area is densely and indiscriminately vegetated with shrubs, vines, and deciduous trees. While this area is within the National Register boundary, the (north) woods were not a part of the Olmsted's original plan for Drumanard."

The north woods is located immediately north of the limits of Alternative A-15.

The Gardener's Cottage has been relocated to a site northeast of the limits of Alternative A-15. In reviewing the current condition of this structure, Ms. Amos concluded that the Gardener's Cottage has been altered to the point that its historic integrity has been significantly compromised and has lost its contributing factors.

2. 2003 Record of Decision

Section 3.9 of the ROD (pages 28 and 29) documents the Section 4(f) analysis and determinations for the Drumanard Estate Historic District as follows:

> *The Drumanard Estate Historic District is a NRHP-listed historic district that is also part of the Country Estates of River Road Historic District or (Country Estates Historic District). The Country Estates Historic District consists of all or portions of a string of contiguous estates, many with designed landscapes, covering approximately 729.4 acres northeast of Louisville.*
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> *The Drumanard Estate is a representation of the Country Estate property type in the Suburban Development context. The property features a historic landscape designed by the nationally known firm of Olmsted Associates and a formal garden designed by Arthur Cowell of Pennsylvania. It includes a Tudor Revival style architectural cluster, one of several such examples by the locally prominent firm of Nevin and Morgan. The dwelling at Drumanard was initially listed on the NRHP in 1983. The boundary was later expanded to include the entire estate of 42 acres.*
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> *The impact of the Project on this historic district was addressed in both the Final Section 4(f) Evaluation (which was included in the FEIS) and the Technical Report on Proximity Impacts to Section 4(f) Properties. In the Final Section 4(f) Evaluation, FHWA determined that the Selected Alternative would not require the use of the surface of this historic property, thereby avoiding a "direct" use under Section 4(f). Moreover, in the technical report, FHWA determined that the Selected Alternative would not result in a constructive use of this historic property. In both instances, the use of a tunnel under the property as part of Alternative A-15 would avoid any Section 4(f) use of the historic*

property. In no event will any of the historic characteristics that supported listing of the Drumanard Estate Historic District in the NRHP be substantially impaired by the construction and operation of Alternative A-15 as part of the Selected Alternative.

The FHWA has concluded that the construction of a tunnel under the Drumanard Estate does not constitute a Section 4(f) use of this historic property, but even if it did, Alternative A-15 with a tunnel is the prudent and feasible eastern bridge/highway alternative that minimizes harm to Section 4(f) resources. The use of the tunnel, the preservation easement, and other commitments identified in the Section 106 MOA demonstrate all possible planning to minimize harm. All other eastern bridge alternatives – with the exception of Alternative A-16 – would have used more Section 4(f) property, and resulted in greater harm to such properties, than Alternative A-15. There are no eastern bridge alternatives that would avoid Section 4(f) property entirely (as there are no downtown or Near East bridge alternatives that would avoid Section 4(f) property entirely).

Although Alternative A-16 would have used less Section 4(f) property than Alternative A-15, Alternative A-16 would have had substantially greater impacts to environmental resources and was therefore deemed not to be a prudent and feasible alternative to the use of Alternative A-15. As noted in the USEPA's review of the DEIS, Alternative A-16 was rated as EO (environmental objections). The EO rating indicated that USEPA had "identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternatives." (None of the alternatives had been identified as a Preferred Alternative at the time of USEPA's comments on the DEIS.)

The USACE, Louisville District also stated in a letter dated March 25, 2003 that Alternative A-16 would have the greatest impact to wetlands. The USACE, Louisville District further noted that impacts to special aquatic sites which include wetlands must be authorized under a permit issued in compliance with the Section 404 (b) (1) guidelines and that it appeared that it may be difficult to prove compliance with these guidelines if Alternative A-16 were chosen. Thus, although Alternative A-16 would have had a lesser impact on Section 4(f) resources, its substantially greater impacts on environmental resources make it not a feasible and prudent alternative for the eastern portion of the Selected Alternative. Consequently, even if Alternative A-15 were deemed to require a Section 4(f) use of the Drumanard Estate Historic District, it would still be the feasible and prudent "minimization" alternative for the eastern bridge.

3. Section 4(f) Criteria

The decisions in the 2003 FEIS, Section 4(f) documentation, and ROD for the LSIORBP were consistent with the then-existing requirements of Section 4(f) of the 1966 *US Department of Transportation Act* and in accordance with FHWA's *Section 4(f) Policy Paper,* revised June 7, 1989. Under the law in effect in 2003, Section 4(f) prohibited the "use" of Section 4(f) properties unless:

1. There is no feasible and prudent alternative that avoids the use of Section 4(f) properties; and,
2. The project incorporates all possible planning to minimize the harm that results from the use of those resources.

Since the approval of the 2003 FEIS, Section 4(f) documentation, and ROD, Congress amended Section 4(f) as part of the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) in 2005. This was the first substantive revision of Section 4(f) legislation since the passage of the *US Department of Transportation Act* of 1966. The revision required the USDOT to issue regulations that clarify the factors to be considered and the standards to be applied in determining feasibility and prudence of avoidance alternatives. The USDOT final rule modified the procedures for granting Section 4(f) approvals in the following five ways:

1. Clarifies the factors to be considered and the standards to apply when determining if an alternative for avoiding the use of a Section 4(f) property is feasible and prudent;
2. Clarifies factors to be considered when selecting a project alternative in situations where all alternatives would use some Section 4(f) property;
3. Establishes procedures for determining that the use of a Section 4(f) property has a *de minimis* impact on the property;
4. Updates the regulation to recognize statutory and common-sense exceptions for uses with programmatic Section 4(f) evaluation; and,
5. Moves the Section 4(f) regulation out of 23 CFR 771.135 to its own place in 23 CFR 774 with a reorganized structure that is easier to use.

As stated in 23 CFR 774.3, the administration may not approve the use of a Section 4(f) property unless:

- There is no feasible and prudent avoidance alternative to use of land from a Section 4(f) property and all possible planning to minimize harm to Section 4(f) properties has been conducted; or
- There is a *de minimis* impact on the property; or
- The project meets the requirements of one of the approved programmatic Section 4(f) evaluations; and
- All coordination requirements have been met.

A feasible and prudent avoidance alternative as defined in 23 CFR 774.17 is one that avoids the use of the Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property. In assessing the importance of protecting the Section 4(f) property, it is appropriate to consider the relative value of the resource to the prudence of an avoidance alternative.

An alternative is not feasible if it cannot be built as a matter of sound engineering judgment. An alternative is not prudent if:

- It results in unacceptable safety or operational problems;
- Reasonable mitigation does not effectively address impacts;

- It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
- It causes other unique or unusual factors; or
- It involves multiple factors listed above that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

When all alternatives result in the use of a Section 4(f) property and if there is no feasible and prudent avoidance alternative, then the Administration may approve only the alternative that causes the least overall harm in light of the statute's preservation purposes. The determination of least overall harm is made by balancing the following factors:

- Ability to mitigate adverse impacts to each Section 4(f) property (including those resulting in net benefits);
- Severity of remaining harm after mitigation to the protected activities, attributes, or features that qualify each property for Section 4(f) protection;
- Significance of each Section 4(f) property;
- Degree to which each alternative meets the purpose and need;
- Magnitude of adverse impacts after reasonable mitigation; and
- Substantial difference in cost among alternatives.

If there are no feasible and prudent alternatives, there are five Nationwide Programmatic Section 4(f) Evaluations for situations that occur frequently. A programmatic Section 4(f) evaluation is essentially a "pre-approved" Section 4(f) evaluation. 23 CFR 774.3(d) provides circumstances under which these may be used. When applying a particular Section 4(f) programmatic evaluation to a specific project, it is only necessary to show that the criteria of the programmatic evaluation are met. No review and comment period or legal sufficiency review is required. The five nationwide programmatic Section 4(f) evaluations are:

- **Independent Bikeway and Walkway Construction Projects** – can be used for constructing bikeways/walkways on parks and recreational properties.
- **Historic Bridges** – applicable for uses involving bridges that are individually eligible for the National Register of Historic Places.
- **Minor Involvements with Historic Sites** – can be used where a project involves a minor take from a property eligible for the National Register of Historic Places. No contributing elements may be demolished and the Section 106 effect determination must be "No Adverse Effect" or "No Historic Properties Affected."
- **Minor Involvements with Parks, Recreation Areas, and Wildlife and Waterfowl Refuges** – applicable to minor property takes/encroachments into parks, recreation areas and wildlife/waterfowl refuges. The programmatic evaluation gives details on what constitutes a minor involvement.
- **Net Benefits** – can be used where the proposed project, with mitigation, would actually result in an overall net benefit to the Section 4(f) property.

Only the Historic Bridges and Net Benefits Nationwide Programmatic Section 4(f) Evaluations are available for projects that prepare an Environmental Impact Statement. The analysis below shows that the project does not qualify for either.

3.1 Potential for Finding of De Minimis Impacts

A *de minimis* impact determination allows FHWA to approve minor uses of Section 4(f) properties, including National Register-listed properties such as the Drumanard Estate Historic District, without formally identifying and evaluating avoidance alternatives, if the impact is minimal after consideration of the positive effects of mitigation actions.

A *de minimis* impact determination can be made by FHWA for a temporary occupancy such as a construction easement. A de minimis impact determination for historic properties must be based on findings made in the Section 106 consultation process. Specifically, a de minimis impact determination can be made if these conditions are met:

1. FHWA has determined, through Section 106 consultation, that the project will have No Adverse Effect on the property;
2. The State Historic Preservation Officer has concurred in writing in FHWA's finding of No Adverse Effect on the property;
3. The Advisory Council on Historic Preservation also has concurred in writing in FHWA's finding of No Adverse Effect on the property, if the Council is participating in the Section 106 consultation; and
4. FHWA's finding of No Adverse Effect has been developed in consultation with the consulting parties in the Section 106 process.

The 2003 MOA stated that there would be an Adverse Effect on the Drumanard Estate and Country Estates historic districts as a result of the bored shaft tunnel underneath US42 and the Drumanard Estate Historic District. The Kentucky SHPO and the Advisory Council are expected to concur that the project will still have an Adverse Effect on these historic properties. There have been no significant changes in the vicinity of the proposed tunnel or in the project design to suggest that the previous Adverse Effect finding for the bored shaft tunnel would change. In addition, a bored shaft tunnel – which has already been determined to have an Adverse Effect – presumably would cause the least harm to the surface resources (see Section 3). Thus, the other construction methods, which are more disruptive to the surface, are also likely to result in an Adverse Effect. Because the Kentucky SHPO and the Advisory Council are unlikely to concur in a finding of No Adverse Effect for any of the three construction options, INDOT and KYTC do not think that a *de minimis* determination is likely with respect to any of these options, and have recommended that the *de minimis* 4(f) option not be pursued further.

3.2 Potential Application of the Net Benefit Programmatic Section 4(f) Evaluation

The net benefit nationwide programmatic Section 4(f) evaluation allows the use of a Section 4(f) property when the transportation use, the measures to minimize harm and the mitigation incorporated into the project result in an overall enhancement of the Section 4(f) property when compared to both the future do-nothing or avoidance alternatives and the present condition of the Section 4(f) property, considering the activities, features and attributes that qualify the property for Section 4(f) protection. A project does not achieve a net benefit if it will result in a substantial diminishment of the function or value that made the property eligible for Section 4(f) protection.

The net benefit nationwide programmatic Section 4(f) evaluation may be used for an historic property if:

1. The proposed project includes all appropriate measures to minimize harm and subsequent mitigation necessary to preserve and enhance those features and values of the property that originally qualified the property for Section 4(f) protection.
2. The project does not require the major alteration of the characteristics that qualify the property for the NRHP such that the property would no longer retain sufficient integrity to be considered eligible for listing.
3. Consistent with 36 CFR part 800, there must be agreement reached between the SHPO, the FHWA and the state transportation agency on measures to minimize harm for the use of the property. These measures must be identified and incorporated into the project.
4. There must be a finding, given the present condition of the property, that the do-nothing and avoidance alternatives are not feasible and prudent.
5. This programmatic evaluation may be used only if FHWA ensures that the project includes all possible planning to minimize harm and includes appropriate mitigation measures.
6. The SHPO must agree in writing with FHWA's assessment of the impacts; the proposed measures to minimize harm; and the mitigation necessary to preserve, rehabilitate and enhance those features and values of the property; and that such measures will result in a net benefit to the property.
7. During the public hearing for the SEIS, the information on the proposed use of the property must be communicated to the public for an opportunity to comment.

For the Net Benefit Programmatic Section 4(f) Evaluation to be used, each of these criteria listed above would have to be satisfied with respect to the Drumanard Estate Historic District while taking into account the character and condition of the Country Estates Historic District. The net benefit approach was considered for the cut and cover option including the revegation of the landscape to match the Olmsted landscape design. However, given the disruption to the landscape that would be required and the importance of the setting to the characteristics that qualify the property for the NRHP, it is unlikely that the SHPO would agree that this was not a "major alteration" of the historic property or that sufficient measures could be adopted to mitigate the effect of this alteration on those features and values of the property that make it eligible for listing on the NRHP. Therefore, while it is possible that a Programmatic Section 4(f) Evaluation could be pursued for the cut-and-cover option, that approach is not likely to be viable.

For the same reasons, it is highly unlikely that a Programmatic Section 4(f) Evaluation could be used for the open-cut option. The open cut option would permanently divide the Drumanard property, without providing offsetting benefits to the property. Given these impacts, it is highly unlikely that an open-cut option would be considered a net benefit.

The bored shaft tunnel option completely avoids the use of the Drumanard property, so no Section 4(f) approval would be required for that alternative with respect to the Drumanard property. Therefore, it is not necessary to consider using the Net Benefit Programmatic Section 4(f) Evaluation for the bored shaft option.

4. Potential Impacts of the Options

The following subsections outline qualitative impacts resulting from each of the three construction methods: bored shaft, cut and cover, and open cut. The table below presents a comparison of impacts between the three options based on qualitative and quantitative analysis.

Table 1 – Comparison of Impacts

Environmental Resources	Bored Shaft	Cut and Cover	Open Cut
Social and Economic			
Agriculture			
Air Quality			
Noise			
Vibration			
Natural Resources			
Water Resources			
Floodplains	n/a	n/a	n/a
Wetlands	n/a	n/a	n/a
Visual			
Hazmat	n/a	n/a	n/a
Energy			
Construction Impacts			
Historic Resources			
General Public Controversy			

Impact levels: Green = Low; Yellow = Medium; Red = High

Sections 3.1 through 3.12 present potential permanent impacts following construction of the proposed facility. Construction-related impacts are presented in 3.13.

4.1 Social and Economic Impacts

The presence of an open cut through the property would permanently reduce the overall size of the Drumanard property by 11.5 acres with a corresponding reduction in the tax base. Both the bored shaft and cut and cover options would not result in any change in the usable size of the property following construction. As discussed in the remainder of Section 3, proximity effects for nearby developments – Bridgepointe, Shadow Wood, and the Harbors – would be greater for the open cut than for either tunnel. The open cut would have greater impacts on the Prospect and Harrods Creek communities during the construction phase and during the permanent operations of the new facility.

4.2 Agriculture

Although the area impacted is not actively farmed, it is undeveloped space which could be converted to farmlands in the future. The open cut method would result in a permanent loss of 11.5 acres of arable land. Neither the bored shaft nor the cut and cover option would result in a loss of available arable land following construction.

4.3 Air Quality

The different tunnel construction options would result in negligible differences in air quality impacts between scenarios.

4.4 Noise

Each of the tunnel construction options would have increases in noise during the construction period. The cut and cover option and the open cut option would have similar levels during construction. Both options would have greater noise impacts than the bored tunnel. The introduction of traffic along a new alignment increases the noise levels currently experienced in the area. Through analysis and consultation with Section 106 consulting parties documented in the 2003 FEIS, it was determined that Alternative A-15 with the bored shaft tunnel would have an Adverse Effect for the noise impacts on the Drumanard Estate Historic District, the Country Estates Historic District, and the Allison Barrickman House. The cut and cover option is likely to have similar noise impacts. Both the bored shaft and cut and cover options would contain this noise because noise-generating traffic would be inside the tunnel, thereby reducing the overall impact. Because the open cut is not enclosed, it would result in greater noise impacts than the other two scenarios, creating a canyon effect for reflective noise which would increase noise levels for adjacent, largely residential areas.

Table 2 shows the expected noise impacts of the open cut and the cut and cover tunnel options on the Drumanard property. The bored shaft tunnel option is expected to have the same noise impacts as the cut and cover tunnel option. As shown in the table, the open cut concept is expected to have a substantial increase in noise over the existing levels (greater than 10 dBA increase).

Table 2 – Comparison of Noise Impacts

Receptor		Existing Sound Level (dBA)	Modified Selected Alternative (2030) (dBA)	Difference Between Existing and 2030 Build (dBA)	Applicable Noise Abatement Criteria Level	Noise Impact/Type	
						Approach or Exceed NAC?	Substantial Increase Over Existing (>10 dBA)?
Open Cut Concept							
Drumanard House TRC-2 (Historic)	Residential	52.3	70.5	18.2	67	No	Yes
Cut and Cover Tunnel Concept[1]							
Drumanard House TRC-2 (Historic)	Residential	52.3	61.5	9.2	67	No	No

[1] The bored shaft tunnel option is expected to have the same noise impacts as the cut and cover tunnel option.

4.5 Vibration

Construction of any of the three tunnel options would result in similar levels of vibration. Through analysis and consultation with Section 106 consulting parties documented in the 2003 FEIS, it was determined that Alternative A-15 with the bored shaft tunnel would have an Adverse Effect for temporary vibration impacts on both the Drumanard Estate Historic District and the Country Estates Historic District during construction. The other construction methods for the open cut tunnel and the cut and cover tunnel are likely to have greater adverse vibration impacts if blasting is done because both are nearer to the surface..

4.6 Natural Resources

Construction of the bored shaft tunnel would not disturb the ground surface and would not result in a loss in vegetation or habitats. Construction of the cut and cover tunnel would disturb 6.7 acres of natural areas. However, impacts would be temporary; following construction, the area could be replanted. Construction of the open cut would require 11.5 acres of permanent right of way. The area of the open cut would permanently eliminate 9.5 acres of natural areas, resulting in a permanent loss of vegetation and habitats.

4.7 Water Resources

An unnamed tributary of Harrods Creek passes through the tunnel site. The bored shaft tunnel would have negligible impacts on the stream because it would pass well below the stream bed. The cut and cover tunnel would require the temporary relocation of the creek, which would be restored following construction. The open cut option would require the permanent relocation of the creek. While the creek is not listed in the National Register nomination form as a contributing resource, it is mentioned as a prominent element of the Design Landscape Features that "leads the eye from the woods in the west across a manicured lawn to a planned meadow..." It is also classified as "Waters of the United States," which means that any construction work in Harrods Creek would require a permit under Section 404 of the federal Clean Water Act. Section 404 prohibits the discharge of any dredged or fill material into any "water of the U.S." unless there is no practicable alternative that causes less harm to the aquatic ecosystem. Both the open cut and cut and cover tunnel options will have temporary impacts on water quality until the stream bank is reestablished and revegetated. A cut and cover tunnel would require temporary relocation of 820 feet of the tributary to Harrods Creek within the Drumanard Estate Historic District. The open cut would require permanent relocation of 885 feet of the tributary.

4.8 Floodplains

There are no floodplains in the vicinity of the Drumanard tunnel; none of the construction techniques would result in an impact on floodplains.

4.9 Wetlands

There are no wetlands in the vicinity of the Drumanard tunnel; none of the construction techniques would result in an impact on wetlands.

4.10 Visual Impacts

The rolling terrain and existing vegetation largely screen the location of the tunnel from surrounding views. The bored shaft tunnel would result in minimal visual impacts as the majority of the work would occur below the ground surface and would not be visible from the Drumanard Estate and Country Estates Historic Districts. However, through analysis and consultation with Section 106 consulting parties documented in the 2003 FEIS, it was determined that Alternative A-15 with the bored shaft tunnel would have an Adverse Effect for the visual impacts on both the Drumanard Estate Historic District and the Country Estates Historic District.

The cut and cover tunnel would result in visual impacts during construction activities, but would result in minor permanent impacts (similar to the bored tunnel option) as the area above the tunnel would be restored to its original condition or better following construction. The cut and cover tunnel would require a construction easement that would be 250 feet wide across the Drumanard Estate Historic District, ranging in depth between 50 and 100 feet and approximately 1,200 feet long.

The open cut would create a permanent trench through the Drumanard Estate Historic District that would be approximately 300 feet wide, varying from 10 to 50 feet deep and approximately 1,200 feet long. Following construction, the open cut would remain visible to travelers on US42, as well as from the Allison Barrickman property and some residences in the Bridgepointe Subdivision; thus, it would result in the most visual impacts of the three scenarios considered.

It should be noted that other surrounding properties – the Bridgepointe subdivision and the Allison Barrickman property – may experience visual impacts during construction for both the cut and cover and open cut construction. After construction, the visual characteristics of the bored shaft tunnel and the cut and cover tunnel would be approximately the same because the roadway would be underground and the surface would be revegetated. However, the open cut option would create a permanent visual impact that would be seen from the Allison Barrickman property and some residences in the Bridgepointe Subdivision as well as travelers on US42.

4.11 Hazardous Materials

There are no known hazardous materials in the vicinity of the Drumanard tunnel; none of the construction techniques would result in an impact on hazardous material sites.

4.12 Energy

The energy use for the construction of the bored shaft tunnel would be less than the energy used for the construction of either the cut and cover tunnel or the open cut since there would be less material excavated and hauled to a waste site during construction. The amount of material to be removed would be approximately the same for the cut and cover tunnel and the open cut. However for the cut and cover tunnel, a greater amount of energy would be used in the excavation, constructing the tunnel, hauling, storage and replacement of overburden, and mitigation than for the open cut or the bored shaft tunnel. The construction of the open cut, including the haul to a "to be designated" waste site location, would require a greater amount of excavation than the bored shaft tunnel. There would be no difference in the energy use of vehicles driving on the roadway with a tunnel or open cut.

4.13 Construction Impacts

Impacts during construction would vary between the three scenarios and are discussed below.

The bored shaft tunnel would result in the fewest construction impacts – the smallest construction staging areas and minimal maintenance of traffic concerns – with the majority of work contained below ground. However, it would take the longest to complete, estimated to last three to four construction seasons. Vibration impacts are similar to those for other scenarios. Through analysis and consultation with Section 106 consulting parties documented in the 2003 FEIS, it was determined that Alternative A-15 with the bored shaft tunnel would have an Adverse Effect for the construction impacts on both the Drumanard Estate Historic District and the Country Estates Historic District.

The cut and cover option would have temporary adverse construction impacts associated with noise, dust and maintenance of traffic. Currently, an estimated 23,400 to 31,900 vehicles per day use US42 in the vicinity of the proposed tunnel.

- *Construction Easement* - A construction easement of approximately 7.8 acres will be required within the Drumanard Estate Historic District for the cut and cover construction method. The temporary 250-feet-wide construction easement will be located approximately 500 feet north of the historic structure in the Drumanard Estate Historic District.

- *Disturbed Area within the Construction Easement* - Construction would result in a disturbed area of 7.4 acres within the 7.8 acres construction easement. Construction materials and equipment staging would be located within this disturbed area. Following construction, this area would be returned to its original condition or better.
- *Construction Vibration* - Vibration impacts would be similar to those for other scenarios
- *Noise, Dust, and Visual Impacts* - During construction, noise, dust, and visual impacts would be more noticeable than for the bored shaft construction method as the workspace would not be enclosed below the ground surface.
- *Construction Duration* - Construction would last approximately two to three years. Construction would be more noticeable to the public during this time than the bored shaft tunnel because the workspace would not be enclosed below the ground surface.
- *Maintenance of Traffic* – The cut and cover tunnel would require a more complex maintenance of traffic system than the bored shaft tunnel option, with complicated phasing including temporary realignment of US42. Construction of the tunnel and realignment of US42 would need to be done while maintaining travel on a detour for approximately 30,000 vehicles per day on US42. Temporarily realigning US42 would require a temporary detour bridge to carry US42 over KY841 north of existing US42. This detour would require a 0.7 acre easement from Drumanard Estate Historic District for a three year period. (This 0.7 acre easement is included in the 7.8 acres construction easement discussed above for the cut and cover tunnel.) A significant amount of additional rock would be excavated from Drumanard Estate Historic District when compared to the bored tunnel. The volume of waste materials removed during the excavation phase must be temporarily stored elsewhere until it is used for the cover of the tunnel.

The open cut method would result in the most construction impacts. It would follow the same alignment as the tunnel and would require permanent right-of-way acquisition, severing the Drumanard Estate Historic District into two distinct pieces. The open cut through the Drumanard Estate Historic district would be approximately 1,200 feet.

- *Right-of-Way Acquisition* - The required right-of-way width of the open cut would range from approximately 300 feet to 400 feet through the Drumanard Estate Historic District. This would result in 11.5 acres of permanent right of way acquisition from the Drumanard Estate Historic District.
- *Disturbed Area* - Construction would result in a disturbed area of 9.5 acres within the 11.5 acres of required right of way. Construction materials and equipment staging would be located within this disturbed area.
- *Materials Storage* - The large volume of waste materials removed from the open cut must be permanently stored elsewhere.
- *Noise, Dust, and visual Impacts* - During construction, noise, dust, and visual impacts would be more noticeable than in the bored shaft scenario as the workspace would not be enclosed below the ground surface.
- *Vibration* - Vibration impacts would be similar to those for other scenarios.
- *Construction Duration* - Construction would last approximately one to two years and would be more noticeable to the public during this time than the bored shaft tunnel.
- *Maintenance of Traffic* - An open cut would also require a more complex maintenance of traffic system, with complicated phasing including temporary realignment of US42 across a portion of the Drumanard property and construction of a bridge to carry US42 over KY841. These impacts for the maintenance of US42 traffic for the open cut would be similar to the impacts of the cut

and cover option. Temporarily realigning US42 would require a temporary detour bridge to carry US42 over KY841 north of existing US42. This detour would require an additional 0.7 acre easement from Drumanard Estate Historic District for the construction period. (This 0.7 acre easement is in addition to the 11.5 acres of right of way required for the open cut.) The volume of waste materials removed during the excavation phase must be permanently placed elsewhere.

4.14 Historic and Archaeological Resources

Any of the three construction options would almost certainly result in an Adverse Effect on the Drumanard Estate Historic District and the Country Estates Historic District.

Through analysis and consultation with Section 106 consulting parties documented in the 2003 FEIS, it was determined that Alternative A-15 with the bored shaft tunnel would have an Adverse Effect for the visual, noise, vibration, and construction impacts on both the Drumanard Estate Historic District and the Country Estates Historic District. Mitigation measures were identified to offset the Adverse Effects to the Drumanard Estate and Country Estates Historic Districts, which were included in Stipulation III.M and III.N of the Section 106 MOA dated March 26, 2003 (attached to the ROD). FHWA also concluded that the construction of a tunnel under the Drumanard Estate Historic District would not constitute a Section 4(f) use of this historic property (Pages 28-29 of the 2003 ROD). The Selected Alternative would not require the use of the surface of the Drumanard Estate Historic District property, thereby avoiding a "direct" use under Section 4(f). FHWA also determined that the Selected Alternative would not result in a constructive use of this historic property. The use of a bored shaft tunnel under the property as part of the 2003 Selected Alternative would avoid any Section 4(f) use of the historic property.

Since the bored shaft option presented in the FEIS process was determined to have a Section 106 Adverse Effect to the Drumanard Estate and Country Estate Historic Districts, the cut and cover option, which is more disruptive to the surface, would almost certainly also receive an Adverse Effect determination due to the impacts described in the previous subsections. The option would result in a temporary use (construction easement) of the 7.8 acres of Section 4(f) property including substantial construction disturbance to 7.4 acres within the historic property boundary and the temporary relocation of the unnamed tributary to Harrods Creek during construction, a key focal point of the Olmsted landscape plan. The cut and cover option would also remove trees within the right-of-way of A-15 on the Drumanard Estate Historic District. The dense woods on the north and west were identified in the National Register nomination form as representative of the "impression of restful seclusion" within the Olmsted design. Though the survey of the trees within the limits of Alternative A-15 conducted by Arborist Robert Rollins concluded there were no trees that were originally planted in accordance with the Olmsted landscape plan remaining within the area, the trees that remain contribute to the "restful seclusion" referenced in the National Register nomination. This further supports the assumption that this proposal would be determined to be an adverse effect to this historic property.

The open cut option would have a permanent adverse impact on the Drumanard Estate Historic District. This option would also almost certainly receive a Section 106 Adverse Effect determination for the Drumanard Estate and Country Estate Historic Districts and would also result in a direct Section 4(f) use of 11.5 acres of the Drumanard property, including permanent relocation of the tributary, a key focal point of the Olmsted landscape plan. The open cut construction option would create a man-made divide of the Drumanard Estate Historic District, separating it into two sections. The trench would result in the permanent loss of 11.5 acres within the National Register-listed boundary.

4.15 General Public Acceptance

The current design of the Modified Selected Alternative includes the bored shaft tunnel option. This has been the only option presented during the extensive public involvement process both during the original environmental phase of the project and subsequent project development. The Regional Advisory Council, Area Advisory Teams, Section 106 Consulting Parties, the Bi-State Historic Consultation Team, the Kentucky Historic Preservation Advisory Team, and the general public were involved during the decision making and post development stages of the project.

Alternative A-15 with the bored shaft tunnel option was presented during the public hearing and meetings for the original NEPA/Section 4(f) process. Cost estimates presented in the FEIS/ROD were based on a bored shaft tunnel. The tunnel was included in Alternative A-15 to mitigate its impacts to the community. However the type of tunnel construction was not specified in either the ROD or Section 106 MOA. Section 4.1.12 of the 2003 ROD contained commitments relating to the design, construction and operation of the tunnel.

The cut and cover option was not presented to stakeholders during the original decision making stage nor has it been presented during the subsequent development stage. However based on communications from leaders in the City of Prospect, which is situated adjacent to the proposed tunnel location, many stakeholders in the East End Area in Kentucky are likely to regard the construction impacts and maintenance of traffic impacts for a cut and cover tunnel as unacceptable.

The open cut option was not presented to stakeholders during the original NEPA/Section 4(f) process nor has it been presented during the subsequent project development stage. The elimination of the tunnel and the construction of an open cut through the Drumanard Estate Historic District are contrary to the ROD commitments and stakeholder expectations. During the NEPA public involvement process prior to the publication of the ROD in 2003, numerous comments were received opposing an open cut through Drumanard Estate Historic District. Based on extensive meetings and communication with the public and interested parties since the ROD, KYTC expects that many members of the public, particularly in Prospect, as well as the Section 106 consulting parties, would perceive a proposal to consider construction of an open cut through US42 and the Drumanard Estate Historic District to be a breach of faith on an important commitment made in the 2003 ROD. As a result of past experiences with the community, KYTC predicts strong public opposition if the open cut is studied again. KYTC has already received some strong statements of opposition to an open cut from citizens and community leaders based simply on rumors that such a change might be under consideration. Because it results in more severe impacts in a number of categories, this option is likely to result in a larger degree of public controversy than the bored shaft tunnel that has been presented during previous project development stages.

5. Evaluation of Options for A-15 through Drumanard

5.1 Section 4(f) Avoidance Alternatives

During the original NEPA/Section 4(f) process, there were no alternatives that entirely avoided a Section 4(f) use. The FEIS comparison of Section 4(f) uses (FEIS Chapter 6) demonstrates that Alternatives A-13, A-15, and A-16 are the East End alternatives with the least harm to Section 4(f) properties. The FEIS stated that each of these alternatives would use property from only one Section 4(f) property: the Swartz Farm Rural Historic District. Each would use the same amount of property and would have the same impacts on the District.

- Alternative A-16 would have substantially greater ecological impacts than the other two, such as greater impacts to Harrods Creek, potential for adversely impacting the Louisville Water Company property's lagoons and public drinking water distribution system within a wellhead protection area, and community impacts within Prospect. These impacts created an Environmental Objection to Alternative A-16 from the United States Environmental Protection Agency.
- Alternative A-13 would have greater community impacts (to Utica) than the other two. It would also result in the greatest impacts to archaeological sites and the second highest number of residential relocations of all the East End Alternatives considered.

For the eastern bridge, Alternative A-15 was determined in the 2003 ROD to be the feasible and prudent alternative with the least harm to Section 4(f) Properties and with the least overall environmental impacts because:

- There were no avoidance alternatives since all eastern alignments would use Swartz Farm, a historic property and Section 4(f) resource.
- A bored shaft tunnel under Drumanard Estate Historic District would avoid any direct or constructive use of that property.
- This alternative results in fewer impacts on the nearby communities and the natural environment than Alternative A-13 or A-16.

The 2003 ROD (Section 3.09 page 29) stated that:

> *"The FHWA has concluded that the construction of a tunnel under the Drumanard Estate does not constitute a Section 4(f) use of this historic property, but even if it did, Alternative A-15 with a tunnel is the prudent and feasible eastern bridge/highway alternative that minimizes harm to Section 4(f) resources. The use of the tunnel, the preservation easement, and other commitments identified in the Section 106 MOA demonstrate all possible planning to minimize harm. All other eastern bridge alternatives – with the exception of Alternative A-16 – would have used more Section 4(f) property, and resulted in greater harm to such properties, than Alternative A- 15. There are no eastern bridge alternatives that would avoid Section 4(f) property entirely....Although Alternative A-16 would have used less Section 4(f) property than Alternative A-15, Alternative A-16 would have had substantially greater impacts to environmental resources and was therefore deemed not to be a prudent and feasible alternative to the use of Alternative A-15."*

Since the approval of the 2003 ROD, there have been changes to two Section 4(f) resources that must be taken into account during this DSEIS and Section 4(f) evaluation: the Swartz Farm and the Utica Lime Industry site:

- In 2007, the Swartz Farm House – one of three contributing buildings to the Swartz Farm Rural Historic District – was demolished. Subsequently, the Indiana SHPO determined that the district is no longer eligible for NRHP listing and the remaining Central Passage House is not individually eligible for NRHP listing. Consequently, the Swartz Farm historic district is no longer a Section 4(f) resource and does not warrant further Section 4(f) evaluation.

- At the time of the 2003 ROD, the Utica lime kilns were outside the right-of-way limits of the preferred alternative, so there was no use of this resource. (The Utica lime kilns were discussed in Section 5.3 and depicted on Figure 6.2-4 of the 2003 FEIS.) However, an adverse effect was determined in the Section 106 process as a result of proximity impacts (vibration). Therefore, the MOA in the 2003 FEIS included mitigation for the lime kilns (Stipulation III.H.1-8) to prepare an HPP and Condition Report; develop a blasting and vibration plan and a no-work zone; repair damage caused by construction; acquire Kiln 48004; place interpretative signage at an appropriate location; and seek NRHP nomination of the resource. Since the 2003 ROD, the HPP has been under preparation, which resulted in the expansion of the historic boundary of each kiln to include the associated quarries. The expansion of two of the sites (48003 and 48004) extended the historic boundaries into the footprint of the shared alignment of the build alternatives (i.e., the Alternative A-15). Because Alternative A-15 would pass within the expanded boundaries associated with the two quarries, a use would occur, and further Section 4(f) evaluation must occur.

  Both the FEIS Selected Alternative and Modified Selected Alternative would use 0.84 acre of the quarry that is associated with Kiln 48004 and 0.22 acre of the quarry that is associated with Kiln 48003. This use would not include use of the any of the lime kilns themselves. Recent coordination from the Indiana SHPO, dated October 23, 2011, states that the quarries would not warrant preservation in place, but that statement did not include the kilns themselves (see DSEIS Appendix D.9)

  The Section 4(f) analysis documented in Chapter 6 of the DSEIS examines avoidance and least harm options to the lime kiln resource. That analysis concludes that while there are build alternatives that would avoid the lime kiln site, they would have other and more harmful Section 4(f) uses, as well as greater environmental harm, and, therefore, there is no overall Section 4(f) avoidance alternative. Regarding a least harm analysis, Chapter 6 concludes that Alternative A-15 is the option with the least overall harm to Section 4(f) resources and environmental resources.

Therefore, based on the fact that Alternative A-15 completely avoids the Drumanard Estate Historic District and is the least overall harm option with respect to the Utica lime industry site, the conclusion of the 2003 ROD that Alternative A-15 is the least overall harm option with respect to Section 4(f) resources remains valid for the 2011 SEIS.

5.2 Construction Options to a Bored Shaft Tunnel for Alternative A-15

As previously mentioned, Alternative A-15 with a bored shaft tunnel completely avoids the use this Section 4(f) resource (the Drumanard property). The cost of this construction method for the tunnel construction has reached an estimate of $255 million (non-inflated) (for the tunnel only). Members of the public have requested consideration of construction options that reduce the project cost by eliminating the tunnel altogether, or by using a different construction method for the tunnel. Building on the information presented throughout this analysis, the following subsections describe the feasibility of pursuing either of the two alternative construction techniques as potential cost saving options. This analysis focuses on Section 4(f) requirements because any alternative that eliminates the bored tunnel would result in the "use" of land from the Drumanard property, and therefore would require a Section 4(f) approval for this site. The basic question to be considered is whether a cut-and-cover tunnel option and/or an open-cut option would be approvable under Section 4(f).

5.2.1 Cut and Cover Option

The cut and cover option would involve a temporary direct use of a Section 4(f) resource (the Drumanard Estate Historic District) and therefore would require a Section 4(f) approval. This alternative also would have greater impacts than the bored tunnel on the natural and human environment in the vicinity of the Drumanard Estate Historic District, the Country Estates Historic District, and the US42 corridor. Those impacts would include:

- *Social and Economic impacts*: The overall size of the property would be temporarily reduced by 7.8 acres during the three year construction period.
- *Agriculture*: The cut and cover method would result in any temporary loss of arable land
- *Noise*: Although noise during construction would be greater than the bored shaft scenario, noise levels from operations of the facility would be the same in either tunnel scenario.
- *Natural Resources*: Construction of the cut and cover tunnel would temporarily disturb 7.4 acres of natural areas, resulting in a loss of vegetation and habitats. The area would be revegetated following construction.
- *Water Resources*: The cut and cover tunnel would require temporary relocation of 820 feet of the Harrods Creek tributary.
- *Visual Impact*: The cut and cover tunnel option would create a short-term visual impact that may be seen from the Allison Barrickman property and the Bridgepointe Subdivision. Long term, there would be no noticeable difference from the bored shaft option.
- *Construction Impacts*: The cut and cover tunnel would result in more construction impacts than the bored shaft option: greater noise and visual impacts; higher construction noise levels; a longer duration; more complex maintenance of traffic, including realignment of US42; and larger construction easements, disturb limits, and staging areas. The cut and cover tunnel would require a 7.8 acre temporary easement from the Drumanard Estate Historic District including a 0.7 acre construction easement for this temporary detour of US42.
- *Public Acceptance*: Based on communications from leaders in the City of Prospect, many stakeholders in the East End Area in Kentucky are likely to regard the construction impacts and maintenance of traffic impacts for a cut and cover tunnel as unacceptable, and the pursuit of this option as a breach of faith with the commitment made in 2003 to construct a bored shaft tunnel.

In addition, this cut and cover option would have an adverse impact on the NRHP-listed Drumanard Estate Historic District:

- As in the bored shaft alternative, the cut and cover option would likely result in a Section 106 Adverse Effect Determination for the Drumanard Estate and the Country Estates Historic Districts.
- The cut and cover option would result in the temporary disturbance of 7.4 acres within the NRHP-listed boundary of the Drumanard Estate Historic District and the temporary relocation of the Harrods Creek tributary, a key focal point of the Olmsted landscape plan and a contributing element in the National Register Nomination.
- The cut and cover option would create a temporary man-made divide of the Drumanard Estate Historic District, separating it into two sections.

This alternative does not offer any operational and maintenance savings and would only amount to a 2.2% savings to the total project costs over a 70-year life cycle. In addition, the breadth and severity of construction impacts from a cut and cover tunnel are similar to an open cut although some could be considered temporary in nature if restored. With a cost escalation of approximately $7 million per month for the Modified Alternative (which is projected to cost approximately 30% less than the Selected Alternative described in the 2003 FEIS), any delay greater than 12 months to consider alternative construction methods and obtain necessary approvals would dissipate any savings. Delays could occur from completion of the Section 4(f) approval process for the use of the Drumanard Estate Historic District, the Section 106 consultation process for amending the effects findings and mitigation included in the 2003 Section 106 MOA, public opposition to the cut and cover construction method, maintenance of traffic concerns, and permitting for the stream relocation.

After further evaluation of the magnitude of the potential cost savings, weighed against the substantial impacts discussed in the previous sections and risk of revisiting this particular commitment, a cut and cover tunnel construction is determined to be an unreasonable alternative. Therefore, for all the reasons discussed previously, a cut and cover construction technique through US42 and the Drumanard Estate Historic District will not be considered further in the SEIS/Section 4(f) Evaluation.

5.2.2 Open Cut Option

In light of the predicted impacts, the open cut option would require a substantial direct use of a Section 4(f) resource and would therefore require a Section 4(f) approval for this site. In addition, it would impose greater impacts than the bored-tunnel option on the natural and human environment in the vicinity of the Drumanard Estate Historic District, the Country Estates Historic District, and the US42 corridor. The differences in impacts include:

- *Social and Economic impacts*: The overall size of the property would be reduced by 11.5 acres with a corresponding reduction in the tax base.
- *Agriculture*: The open cut method would result in a permanent loss of 11.5 acres of arable land.
- *Noise*: Because the open cut is not enclosed, it would result in greater noise impacts than the other two scenarios, creating a canyon effect for reflective noise which would increase noise levels for adjacent, largely residential areas.
- *Natural Resources*: Construction of the open cut would remove 9.5 acres of natural areas within the 11.5 acres of required right of way from Drumanard Estate Historic District, resulting in a permanent loss of vegetation and habitats.
- *Water Resources*: The open cut would require permanent relocation of 885 feet of the Harrods Creek tributary.
- *Visual Impact*: The open cut option would create a permanent visual impact that may be seen from the Allison Barrickman property and the Bridgepointe Subdivision.
- *Construction Impacts*: The open cut would result in greater construction impacts than the other two options considered: greater noise and visual impacts; higher construction noise levels; more complex maintenance of traffic, including realignment of US42; and larger construction easements, disturb limits, and staging areas. This alignment would require a 0.7 acre construction easement from the Drumanard Estate Historic District for this temporary detour of US42.

- *Public Acceptance*: The elimination of the tunnel and the construction of an open cut through the Drumanard Estate Historic District are contrary to the ROD commitments and stakeholder expectations.

This open cut option would have a permanent adverse impact on the Drumanard Estate Historic District property:

- As in the other two scenarios, the open cut option would result in a Section 106 Adverse Effect on the Drumanard Estate and Country Estate Historic Districts
- The option would result in a permanent, direct Section 4(f) use of the Drumanard Estate Historic District, including the permanent loss of 11.5 acres within the NRHP-listed historic boundary and the permanent relocation of the Harrods Creek tributary, a key focal point of the Olmsted landscape plan and a contributing element in the National Register Nomination.
- The option would create a man-made divide of the Drumanard Estate Historic District, separating it into two sections.

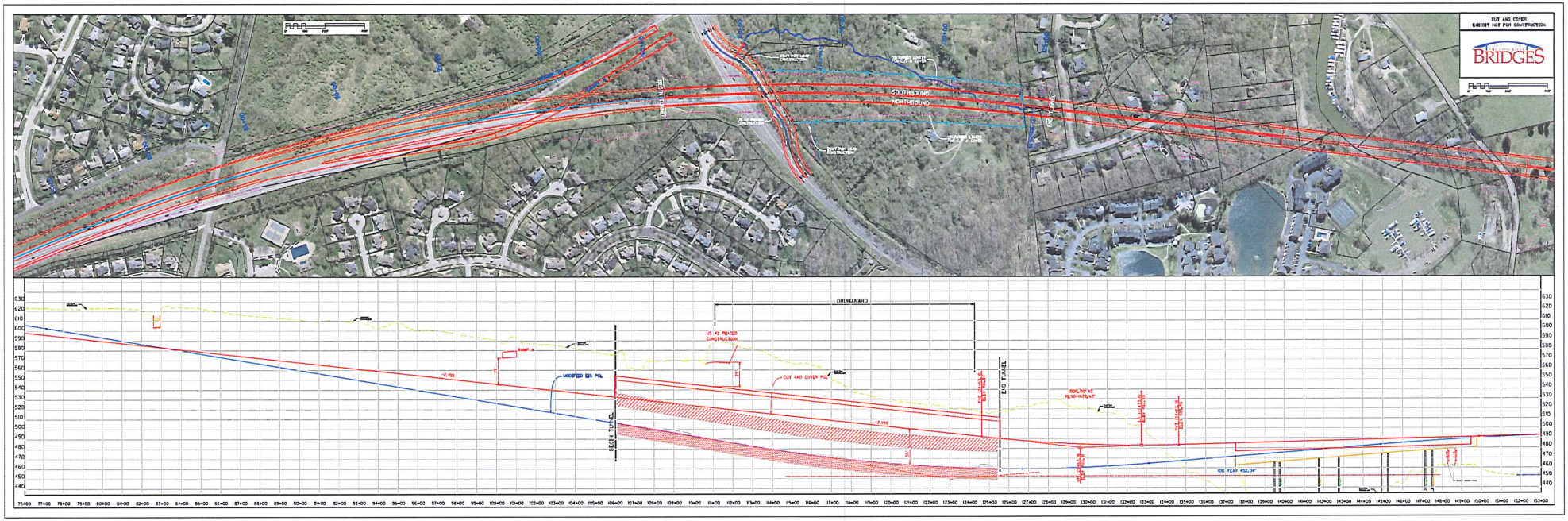
The elimination of the tunnel and the construction of an open cut for Alternative A-15 through the Drumanard Estate Historic District are contrary to the ROD commitments and stakeholder expectations. The savings would amount to only 5.6% of the total project costs over a 70-year life cycle. In addition, the breadth and severity of impacts from an open cut through the US42 corridor and Drumanard Estate Historic District property are much greater, particularly with respect to the Section 4(f) resource and the community at large (discussed in Section 3).

The open cut would result in a significant direct use of the Section 4(f) resource and significantly greater community and environmental impacts than the bored-tunnel option. The potential cost savings associated with this option would likely be diminished, or even eliminated altogether, by the delays associated with seeking Section 4(f) approval for the use of the Drumanard Estate Historic District and the Section 106 consultation process for amending the effects findings and mitigation included in the 2003 Section 106 MOA. Therefore, while cost-reduction is an important objective for this project, the open cut option is not considered to be a reasonable alternative and will not be considered further in the SEIS/Section 4(f) Evaluation.

Attachment A

Alignment A15 Plan Profiles

Alignment A15 Through Drumanard Estate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BRIDGES
SOUTHBOUND
NORTHBOUND
DRUMANARD
BEGIN TUNNEL
END TUNNEL
US 42 PROPOSED CONSTRUCTION
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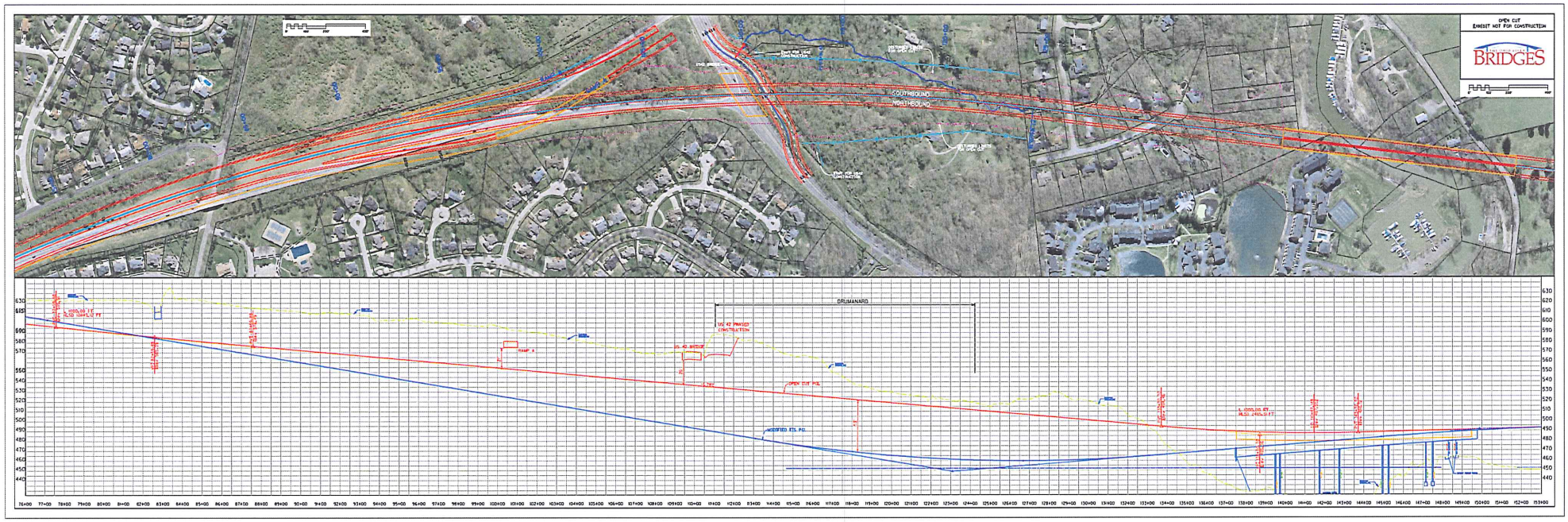
100 YEAR HGL/DP

CUT & COVER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BRIDGES
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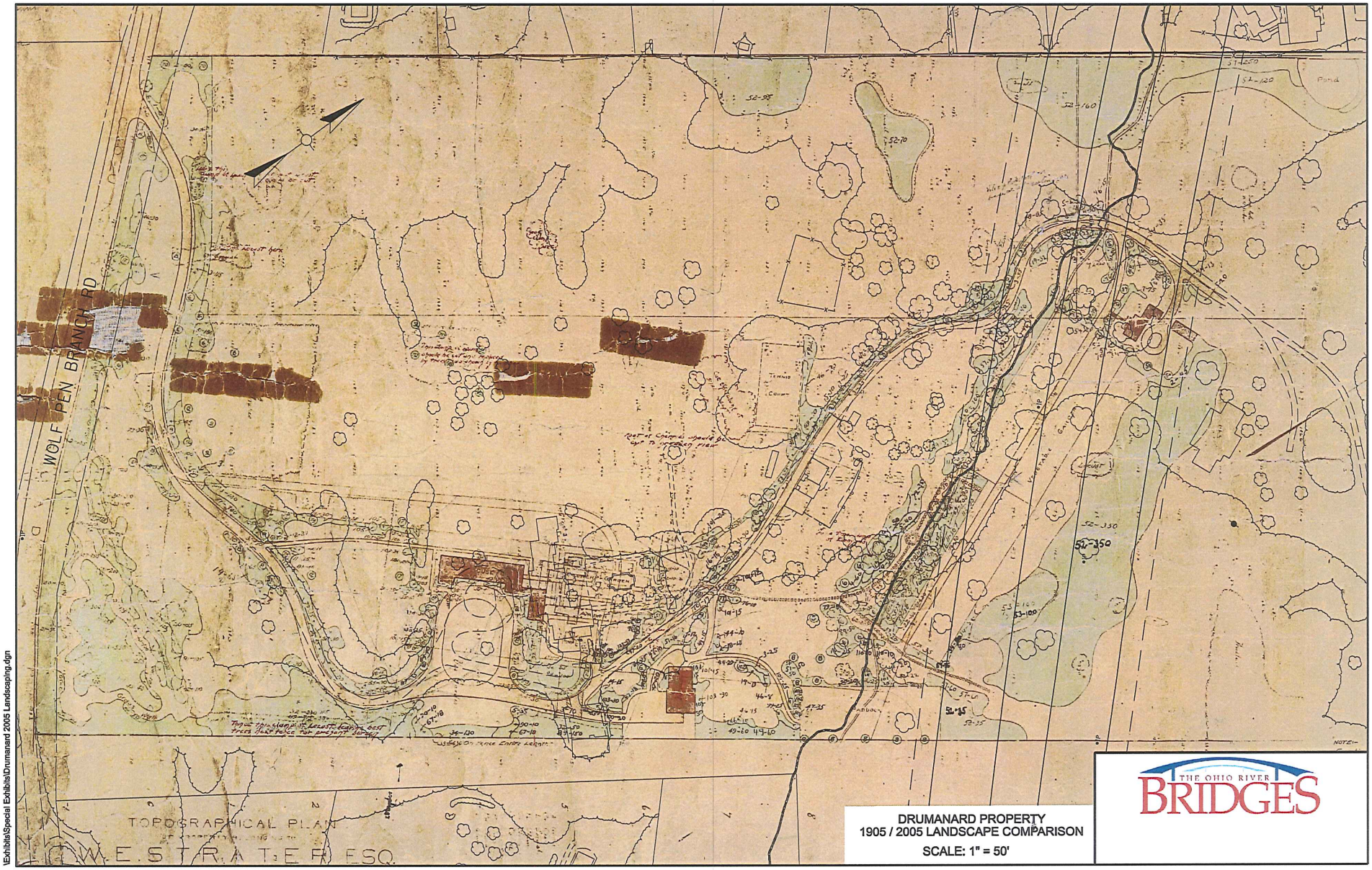
MODIFIED EXL PRL

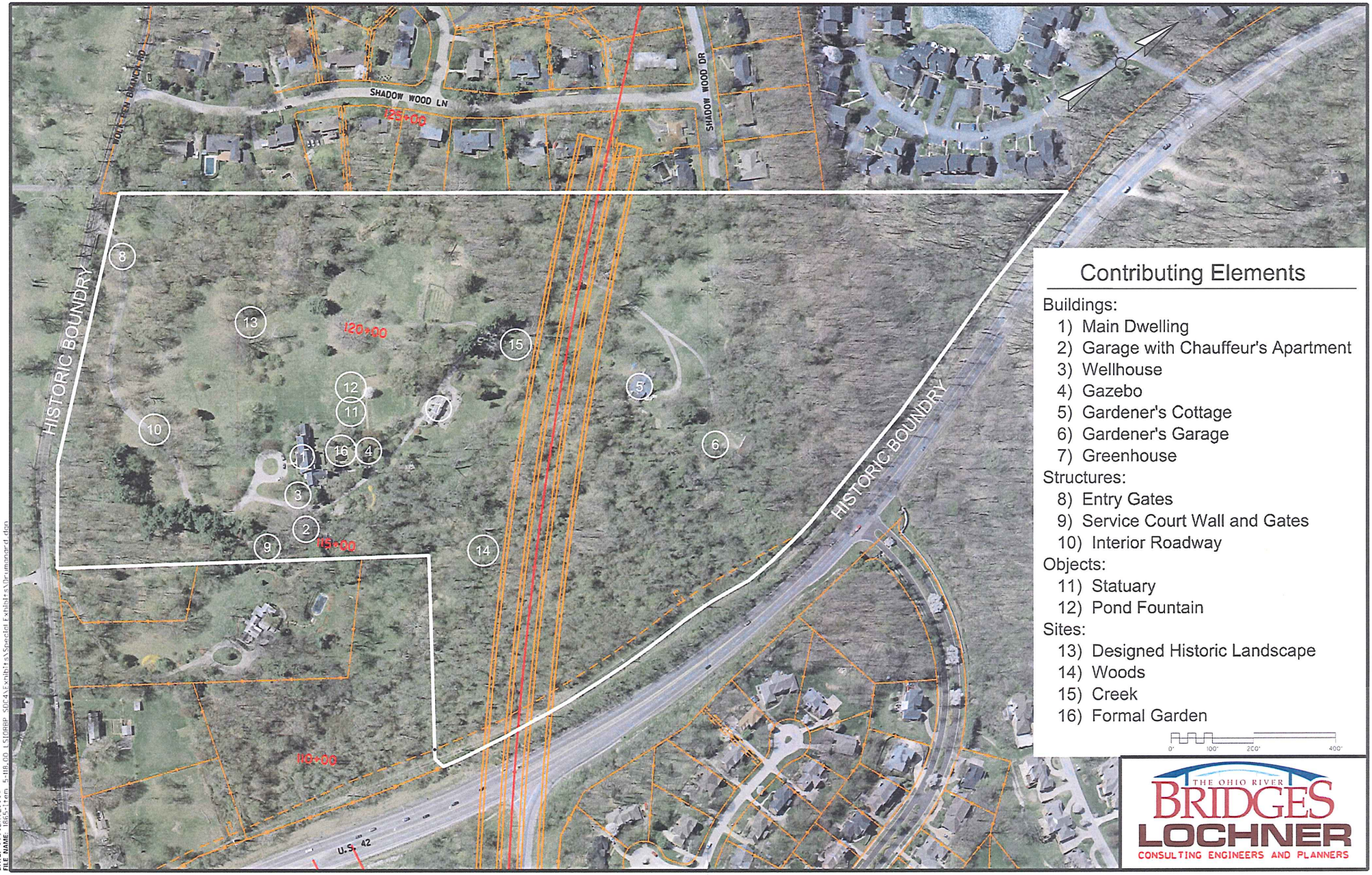
OPEN CUT



DRUMANARD PROPERTY
1905 / 2005 LANDSCAPE COMPARISON
SCALE: 1" = 50'

THE OHIO RIVER BRIDGES

\Exhibits\Special Exhibits\Drumanard 2005 Landscaping.dgn



Contributing Elements

Buildings:

1) Main Dwelling
2) Garage with Chauffeur's Apartment
3) Wellhouse
4) Gazebo
5) Gardener's Cottage
6) Gardener's Garage
7) Greenhouse

Structures:

8) Entry Gates
9) Service Court Wall and Gates
10) Interior Roadway

Objects:

11) Statuary
12) Pond Fountain

Sites:

13) Designed Historic Landscape
14) Woods
15) Creek
16) Formal Garden

0' 100' 200' 400'

THE OHIO RIVER BRIDGES
LOCHNER
CONSULTING ENGINEERS AND PLANNERS

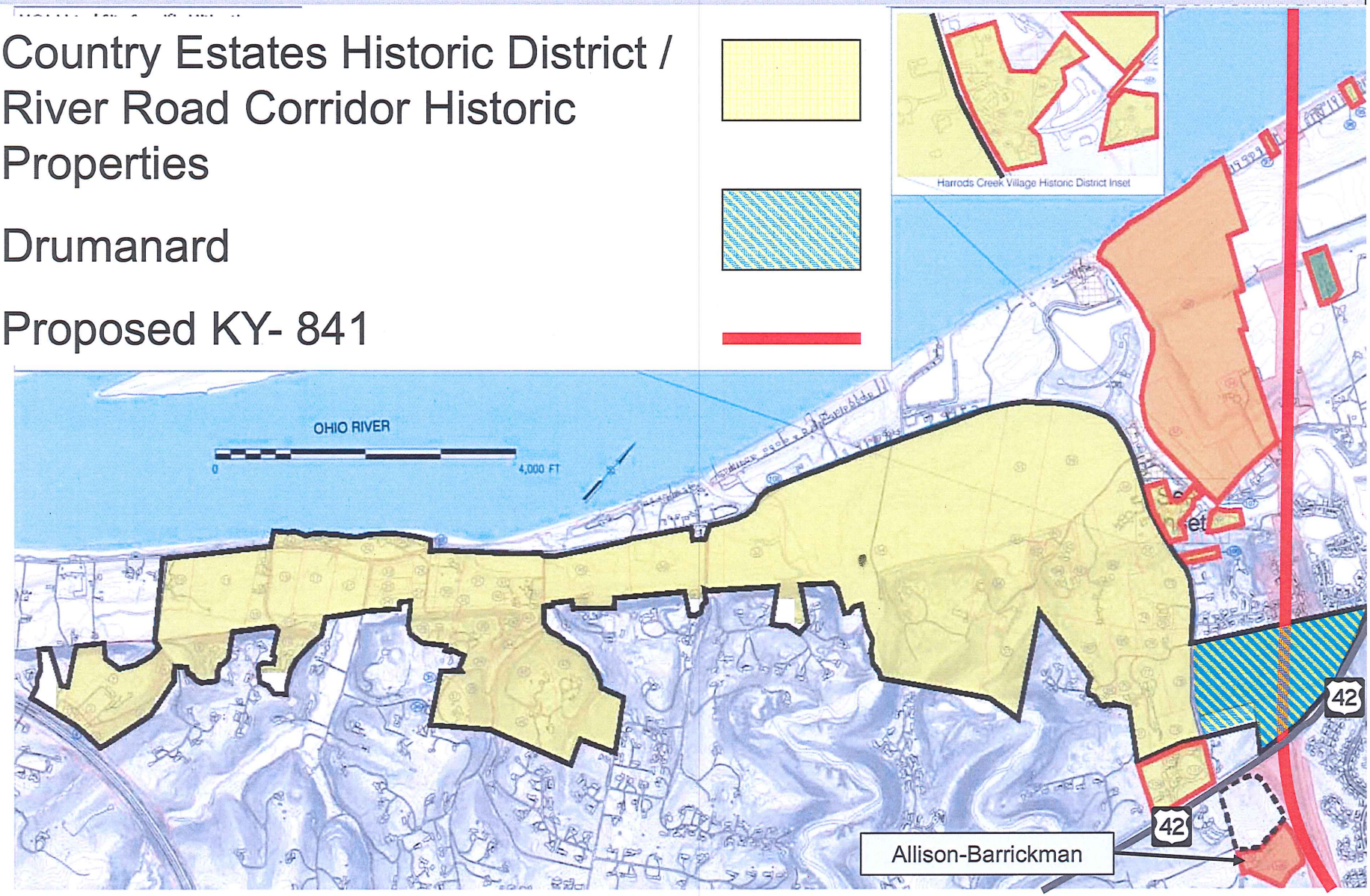
DATE: $$$$DATE$$$$
FILE NAME: 1865-Item 5-118.00 LSTORBP SOC4\Exhibits\Special Exhibits\Drumcard.dgn

Historic Resources

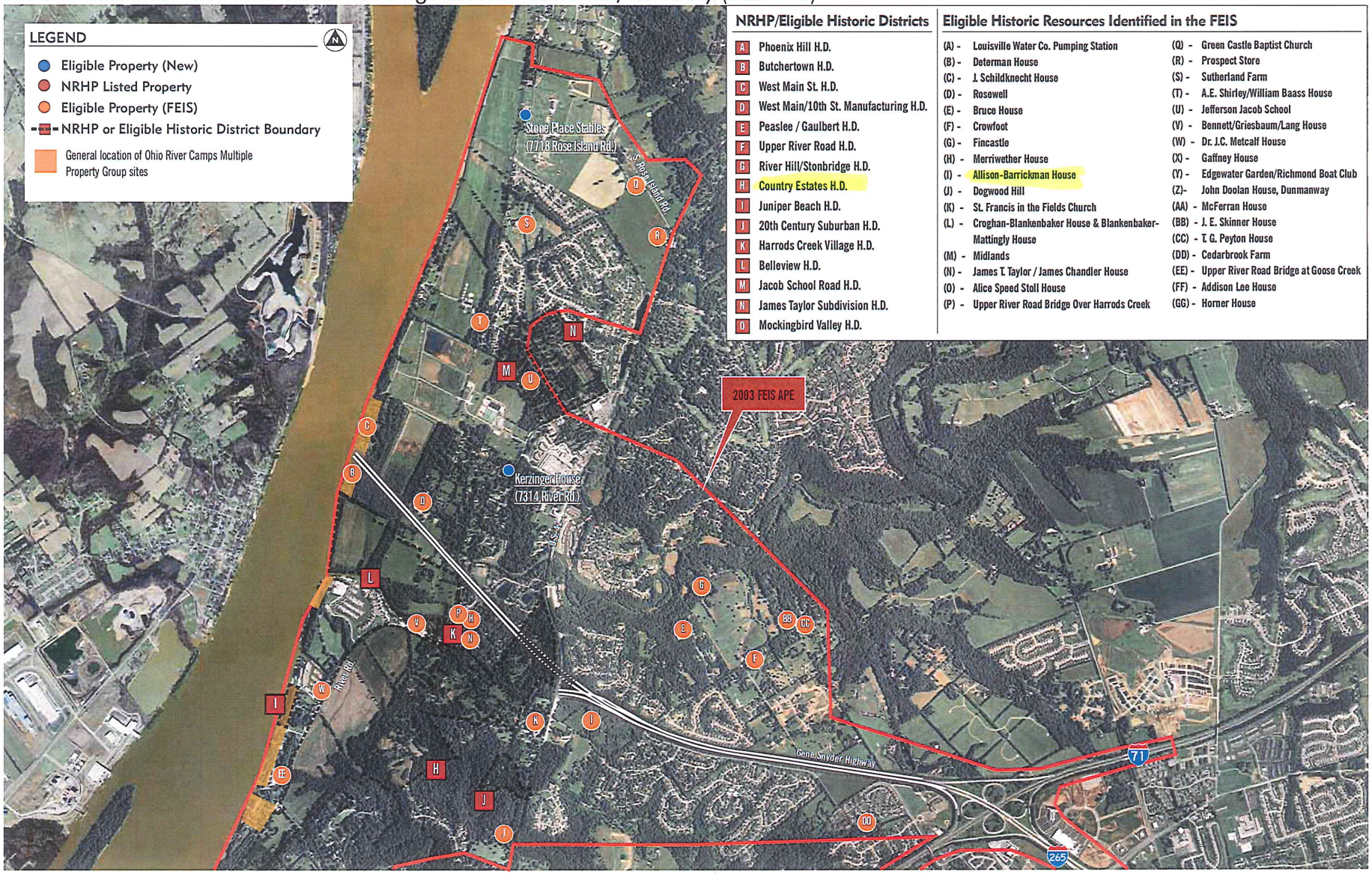
Country Estates Historic District / River Road Corridor Historic Properties

Drumanard

Proposed KY- 841



Historic Resources Identified within the Original APE - Louisville, Kentucky (East End)



NRHP/Eligible Historic Districts

- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main/10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.
- F Upper River Road H.D.
- G River Hill/Stonbridge H.D.
- H Country Estates H.D.
- I Juniper Beach H.D.
- J 20th Century Suburban H.D.
- K Harrods Creek Village H.D.
- L Belleview H.D.
- M Jacob School Road H.D.
- N James Taylor Subdivision H.D.
- O Mockingbird Valley H.D.

Eligible Historic Resources Identified in the FEIS

- (A) - Louisville Water Co. Pumping Station
- (B) - Determan House
- (C) - J. Schildknecht House
- (D) - Rosewell
- (E) - Bruce House
- (F) - Crowfoot
- (G) - Fincastle
- (H) - Merriwether House
- (I) - Allison-Barrickman House
- (J) - Dogwood Hill
- (K) - St. Francis in the Fields Church
- (L) - Croghan-Blankenbaker House & Blankenbaker-Mattingly House
- (M) - Midlands
- (N) - James T. Taylor / James Chandler House
- (O) - Alice Speed Stoll House
- (P) - Upper River Road Bridge Over Harrods Creek
- (Q) - Green Castle Baptist Church
- (R) - Prospect Store
- (S) - Sutherland Farm
- (T) - A.E. Shirley/William Baass House
- (U) - Jefferson Jacob School
- (V) - Bennett/Griesbaum/Lang House
- (W) - Dr. J.C. Metcalf House
- (X) - Gaffney House
- (Y) - Edgewater Garden/Richmond Boat Club
- (Z)- John Doolan House, Dunmanway
- (AA) - McFerran House
- (BB) - J. E. Skinner House
- (CC) - T. G. Peyton House
- (DD) - Cedarbrook Farm
- (EE) - Upper River Road Bridge at Goose Creek
- (FF) - Addison Lee House
- (GG) - Horner House

Attachment B

Tree Assessment for Drumanard Property – Robert Rollins

GREENHAVEN
TREE CARE

November 6, 2006

Jerry Leslie, P.E.
H.W. Lochner, Inc.
1040 Monarch St. Suite 300
Lexington, KY 40513

Re: Tree Assessment for the Drumanard Property/ East End Bridge Connector Project

Dear Mr. Leslie,

Enclosed is the inventory of trees located within the "Cone of Influence" of the East End Bridge Connector on the Drumanard property. These trees were located, identified, measured, and their condition assessed. My findings are as follows:

1. After reviewing the original Olmsted Brothers landscape plan and related documents, current ariel photographs, and conducting an extensive field inspection, none of the trees within the "Cone of Influence" you identified appear to be from the original plan. Of the approximately seventy-three (73) trees in this area all are either not old enough, not of the species listed, or not in the locations shown on the original documents.

KENTUCKY CHAPTER
ISA
CERTIFIED ARBORIST

1901 Williamson Court • Louisville, Kentucky 40223 • (502) 244-8770

2. As indicated, the trees in the "Cone of Influence" are of varying species, size, and condition. If the tunnel is built approximately 35 feet below grade as the current plan shows, then these trees should not be adversely affected to any significant degree by the project. All have the same root depth potential of no more than 5'--- well above any impact by the tunnel itself.
3. From my visual inspection it appears that most of the trees in this area are dependent on surface water. The tunnel project should not adversely affect the amount of water they are receiving. However the monitoring wells already on the property should be able to provide you with more data on water availability than my visual inspection can.

Thank you again for the opportunity to provide professional certified arborist services to your company on this project. I hope that I can work with you on other projects in the future.

Regards,

Robert Rollins
Certified Arborist
KY-0-100-A

TREE SURVEY REPORT
09/18/06
EAST END TUNNEL PROJECT
JEFFERSON COUNTY KENTUCKY

ITEM#	GPS #	DESCRIPTION	SIZE	CONDITION
1.	.41	Norway Spruce	30"	Fair
1A.	.41	Norway spruce	18"	Fair
2.	.42	Catalpa	36"	Fair
3.	.43	Saucer Magnolia	20"	Good
4.	.44	Red Oak	35"	Good
5.	.45	Longleaf Pine	26"	Fair
6.	.46	American Elm	36"	Fair
7.	.47	Sycamore	48"	Good
8.	.48	Tulip Tree	40"	Good
9.	.49	Tulip Tree	40"	Good
10.	.50	Sweet Gum	34"	Good
11.	.51	Japanese Pagoda	34"	Fair
12.	.52	Walnut	30"	Good
13.	.53	Redbud	20"	Poor
14.	.54	Duezia Shrub	10'	Good
15.	.55	Sycamore	16"	Good
16.	.56	Bald Cypress	34"	Good
17.	.57	multi-stemmed shrub	18"	Fair
18.	.58	Redbud	30"	Poor
19.	.59	Osage Orange	42"	Good
20.	.60	American Elm	24"	Good
21.	.61	Amur Maple	8"	Good
22.	.62	Tulip Tree	48"	Good
23.	.63	Tulip Tree	18"	Good
24.	.64	Sugar Maple	16"	Fair
25.	.65	Pin Oak	32"	Poor
26.	.66,.67, or.68	Triple Sycamore	90"	Fair/Poor

ITEM#.	GPS#	DESCRIPTION	SIZE	CONDITION
27.	.69	Dogwood	6″	Good
28.	.70	Holly -left	10″	Fair
29.	.71	Holly-center	6″	Fair
30.	.72	Holly-right	8″	Fair
31.	.73	Redbud	20″	Poor
32.	.74	Black Walnut	14″	Fair
33.	.75	Pin Oak	24″	Fair
34.	.76	Cherry	26″	Fair
35.	.77	Maple	26″	Good
36.	.78	White Pine	28″	Fair
37.	.79	White Pine	35″	Fair
38.	.80	White Pine	34″	Good
39.	.81	American Beech	42″	Fair
40.	.82	Norway Spruce	24″	Fair
41.	.83	White Pine	34″	Fair
42.	.84	White Pine	30″	Fair
43.	.85	White Pine	36″	Good
44.	.86	Twin Silver Poplar	30″	Poor
45.	.87	Persimmon	14″	Good
46.	.88	Dead Sycamore	36″	Poor
47.	.89	Triple Trunk Ash	72″	Fair
48.	.90	Walnut (ivy)	30″	Poor
49.	.91	Walnut	45″	Fair
50.	.92	Bald Cypress	18″	Fair
51.	.93	Bald Cypress	22″	Good
52.	.94	Persimmon	18″	Good
53.	.95	Bald Cypress	23″	Good
54.	.96	American Holly	12″	Fair
55.	.97	American Holly	8″	Good
56.	.98	Twin Am. Holly	10″	Fair
57.	.99	Eastern Red Cedar	24″	Fair
58.	.100	Dawn Redwood	40″	Good
59.	.101	Basswood	30″	Good
60.	.102	Walnut	22″	Fair

ITEM#.	GPS#	DESCRIPTION	SIZE	CONDITION
61.	.103	Ash	33″	Fair
62.	.104	Catalpa	22″	Fair
63.	.105	Walnut	22″	Fair
64.	.106	Hackberry	32″	Fair
65.	.107	Basswood	16″	Good
66.	.108	Hackberry	14″	Good
67.	.109	Hackberry	28″	Poor
68.	.110	Hackberry	34″	Poor
69.	.111	Walnut	42″	Poor
70.	.112	Walnut	16″	Good
71.	.113	Persimmon	7″	Good
72.	.114	Black Locust	18″	Fair
73.	.115	Black Locust	20″	Fair

Attachment C

EASEMENT BASELINE DOCUMENTATION, Drumanard / Drumanard Historic District / Strater-Watson House – Christine Amos

EASEMENT BASELINE DOCUMENTATION

Drumanard / Drumanard Historic District / Strater-Watson House
JF-565
Jefferson County, KY

6401 Wolf Pen Branch Road, Louisville KY 40059

This documentation was prepared in accordance with NPS/NRHP requirements. All items are archival quality including:

- Digital printing with Eastman Kodak archival ink on approved archival Kodak photographic paper (200 year permanence tested by Wilhelm Research. Verified at www.cr.nps.gov/nr/policyexpansion.htm).
- Digital prints saved in TIFF and JPG formats; 1200 x 1600 pixels @ 300 ppi
- Printing on acid free, archival quality paper (Boise-Cascade)
- Lettering with acid free, permanent ink
- Archival, acid free photo and document sleeves
- Archival CD of report and images (TIFF) format.
- Archival CD of images (JPG) format

Prepared by:

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Woodland Park, CO 80863
719-963-8896
amosconsulting@msn.com

April 26, 2010

EASEMENT BASELINE DOCUMENTATION

Drumanard / Drumanard Historic District / Strater-Watson House
JF-565
Jefferson County, KY
April 26, 2010

BY: Christine Amos
Amos Consulting Group llc

FOR: Kentucky Transportation Cabinet
Louisville-Southern Indiana Ohio River Bridges Project
Section 4

INTRODUCTION

This document is prepared on behalf of the Kentucky Transportation Cabinet to provide Architectural, Photographic and Documentary information for a Conservation and Preservation Easement for Drumanard, a National Register listed property.

ORGANIZATION

The information contained herein is organized as follows according to indexed tabs.

EASEMENT BASELINE DOCUMENTATION

Architectural Data

The architectural data, presented in the format provided by the Kentucky Heritage Council, is included for each of seven buildings and two structures on the property. The National Register nomination considers the landscape as two contributing sites; a formal garden and an Olmsted designed landscape for the larger expanse of the estate. These landscapes are considered in the APPENDIX General Comments section following the photographs.

Photographs

Eighty-nine photographs provide a comprehensive view of Drumanard; its buildings, structures, sites and landscapes. Photo logs are inserted within the photographs which are numbered consecutively in order of the resources described on the Architectural Data sheets.

APPENDIX

General Comments

The General Comments address the sequential documentations of Drumanard from individual National Register listing, inclusion in the Country Estates of River Road Rural Historic District, information obtained at the Frederick Olmsted Archive at Brookline, MS, concerning the designed landscapes, and on-site documentation of existing conditions. Jim Klein, Landscape Architect for LSIORBP Section 4 conducted the research at the Olmsted archive and prepared a letter concerning the evolution of the landscape as well as recommendations for areas considered for easement. Also in this section are conceptual plans, planting plans and some examples of plant lists from the Olmsted records.

Aerials

Scans of historic (1937) aerial maps and recent aerial maps of Drumanard are provided to consider changes in the landscape over the past 70+ years.

National Register Nominations

Copies of the NR Nomination for Drumanard (Keys 1988) and the Country Estates of River Road NR nomination (Brooks 1998) are included.

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Gardener's cottage** **Building #6**
Date(s) of Construction	1920s
Style	Vernacular frame
Material	Wood
Features of Note	Prior to 2005, extensive renovations were begun on the gardener's cottage. Photographs show the original building ca 1985 and currently. The location and setting are the only qualities of integrity that remain for the building.
Alterations(s)	Extensive. Building in midst of renovation (work ceased) and is not habitable.
Present Use	Not occupied; unfinished
Photograph #	62-65

EXTERIOR CONDITION

Foundation	Material	Concrete block and formed concrete
	Condition	Good
	Photograph #s	
Wall Type	Material	Wood frame
	Condition	Good
	Moisture Problems	The building is open to the elements. There is no siding on much of the exterior. A moisture barrier originally placed over the new plywood sheathing is mostly blown/torn off.
	Spalling	Na
	Efflorescence	Na
	Masonry Joints	Na
	Rising Damp	Na
	Cracks	Na

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

	Bulges	Na
	Settlement	Na
	Condition of Wood	Fair to poor
	Other	
	Photograph #s	62-65
Windows	Material	None
	Condition	
	Storm Windows	
	Shutters	
	Photograph #s	
Doors	Material	None
	Condition	
	Storm Doors	
	Photograph #s	
Cornice/Soffit	Material	None
	Condition	
	Photograph #s	
Gutters	Material	None
	Condition	
	Photograph #s	
Downspouts	Material	None
	Condition	
	Photograph #s	
Roof	Material	Asphalt shingles
	Condition	Good
	Photograph #s	62, 64
Chimney(s)	Material	One original brick central chimney
	Condition	Good
	Photograph #s	62, 66
Porches	Material	New, front porch gabled entry and front porch facing south at front elevation. Completely new materials and design
	Condition	Fair
	Photograph #s	62
Trees and Shrubs	Type	Landscape surrounding gardener's cottage is not part of the Olmstead plan. There is no formal planting at the cottage.
	Condition	Na
	Photograph #s	62, 64

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

General Comments:

The gardener's cottage, originally built in the 1920s and perhaps prior to that time has been lost through the remodeling/renovation undertaken by the present owners. The owners stopped the project sometime prior to 2006 and the house has stood in its present, open and abandoned condition since that time.

*This baseline is only intended as a review of visual exterior and interior architectural and landscape components only and is not intended as an opinion regarding the structural integrity or environmental soundness of the premises.

INTERIOR CONDITION

Photographs show there are no interior walls, window, doors, floors, wiring, etc. and the building is not habitable.

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Service courtyard, brick walls and piers** **Structure #1**
Date(s) of Construction	1929
Style	Tudor Revival
Material	Brick masonry, limestone
Features of Note	The service courtyard is enclosed by a brick wall with limestone cap and entry piers. The walls form the south, west and north sides of the courtyard with the garage to the east and vary from 4' to 5' in height at the interior. Piers are taller with limestone caps topped by globes.
Alterations(s)	Recently added gates of unpainted, treated lumber with wire mesh inserts.
Present Use	Wall enclosing service area courtyard
Photograph #	40 –41, 43, 47-54

EXTERIOR CONDITION

Foundation	Material	Poured concrete
	Condition	Good
	Photograph #s	
Wall Type	Material	Brick masonry, six course common bond. Stepped to follow contour of exterior grade Large slab limestone coping. Slightly projected pilasters with quoin effect, spaced along exterior walls to break up expanse. Large square piers with quoins, and limestone globes on square bases at entry.
	Condition	The walls around the courtyard are cracked in several places with missing mortar and some evidence of spalling. General condition is good to fair

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

	Moisture Problems	Some damp/mold remains from invasive ivy that has been pruned away. Especially apparent at north outside wall.
	Spalling	Some
	Efflorescence	Some at interior where ivy has been removed. Also at north exterior wall.
	Masonry Joints	Missing mortar at various locations. Generally fair to good overall except at north exterior wall near arched opening for drainage and at foundation of some piers. Water and damp have eroded mortar. Need cleaning and repointing.
	Rising Damp	North exterior wall.
	Cracks	Some at north wall
	Bulges	None apparent
	Settlement	None apparent
	Condition of Wood	NA
	Other	Limestone coping generally good, with similar cleaning recommended as to brick.
	Photograph #s	40 –41, 43, 47-54
Trees and Shrubs	Type	Naturalized trees and shrubs provide a dense shade around the east/back and north/side of the garage and contribute to dampness.
	Condition	Need maintenance, removal, and selective pruning.
	Photograph #s	47, 50, 51, 53

General Comments:

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EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Entrance gates** **Structure # 2**
Date(s) of Construction	1929
Style	Tudor revival
Material	Brick, limestone
Features of Note	Curving wall ending in piers with quoins and limestone globes on pediments, marking the entrance to the estate at Wolf Pen Branch Road.
Alterations(s)	None
Present Use	Entry
Photograph #	69-73

EXTERIOR CONDITION

Foundation	Material	Formed concrete
	Condition	Good
	Photograph #s	73
Wall Type	Material	Brick masonry, 6 course common bond
	Condition	Good to fair
	Moisture Problems	Some mildew/mold on north side of wall
	Spalling	Spalling in various areas along the walls.
	Efflorescence	Some on north side of wall
	Masonry Joints	Some missing mortar at various locations.
	Rising Damp	Not evident
	Cracks	None
	Bulges	None
	Settlement	None
	Condition of Wood	NA

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

	Other	NA
	Photograph #s	69 - 73
Windows	Material	na
	Condition	
	Storm Windows	
	Shutters	
	Photograph #s	
Doors	Material	na
	Condition	
	Storm Doors	
	Photograph #s	
Cornice/Soffit	Material	na
	Condition	
	Photograph #s	
Gutters	Material	na
	Condition	
	Photograph #s	
Downspouts	Material	na
	Condition	
	Photograph #s	
Roof	Material	na
	Condition	
	Photograph #s	
Chimney(s)	Material	na
	Condition	
	Photograph #s	na
Porches	Material	
	Condition	
	Photograph #s	
Trees and Shrubs	Type	na
	Condition	
	Photograph #s	

General Comments:

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EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Gardener's garage** **Building #7**
Date(s) of Construction	After 1970
Style	Utilitarian
Material	Wood
Features of Note	
Alterations(s)	The garage is not the original built on this site in the early 20th century.
Present Use	Storage
Photograph #	66-68

EXTERIOR CONDITION

Foundation	Material	Poured concrete footers
	Condition	Good
	Photograph #s	
Wall Type	Material	Wood, Pole supports with dimensional lumber box frame
	Condition	Good to fair
	Moisture Problems	At back (north) moisture from vegetation has decayed the lower areas of siding
	Spalling	Na
	Efflorescence	Na
	Masonry Joints	Na
	Rising Damp	Damp/mold damage to board siding at north wall
	Cracks	Na
	Bulges	Na
	Settlement	None
	Condition of	Good to fair, in need of paint and some

	Wood	replacement at lower wall, north side
	Other	
	Photograph #s	66-68
Windows	Material	None
	Condition	
	Storm Windows	
	Shutters	
	Photograph #s	
Doors	Material	Sliding bay doors hung on metal tracks, vertical board
	Condition	Good
	Storm Doors	Na
	Photograph #s	66
Cornice/Soffit	Material	Wood, plain
	Condition	Good to fair
	Photograph #s	67
Gutters	Material	Metal
	Condition	Poor
	Photograph #s	67
Downspouts	Material	Metal
	Condition	Fair
	Photograph #s	67
Roof	Material	Metal, corrugated, Sheds to north (back)
	Condition	Fair
	Photograph #s	66-68
Chimney(s)	Material	None
	Condition	
	Photograph #s	
Porches	Material	None
	Condition	
	Photograph #s	
Trees and Shrubs	Type	NA
	Condition	
	Photograph #s	

General Comments:

The gardener's garage is not the original building that was documented when the property was first listed on the National Register in the 1980s. While it is in a very similar location and of the same general configuration, this building appears to have been built from reused materials. The interior photograph shows a variety of dimensional lumber, with paint from previous uses, used for the box framing. The vertical boards that sheath the exterior are also of more recent date.

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

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EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Greenhouse** **Building #5**
Date(s) of Construction	1972
Style	Utilitarian
Material	Formed concrete, glass, wood, metal
Features of Note	The greenhouse is located on the north side of the drive between the main residential area and the gardener's cottage north of the creek. It is presently used for storage of furniture and miscellaneous items.
Alterations(s)	None
Present Use	Storage
Photograph #	60, 61

EXTERIOR CONDITION

Foundation	Material	Formed concrete at greenhouse, concrete block at cold frames to south elevation (front)
	Condition	Good
	Photograph #s	61
Wall Type	Material	Concrete, wood frame with horizontal lap siding, single pane glazing in metal frame at greenhouse wings. Metal truss floor visible from interior of garage supports center bay and two side greenhouse wings.
	Condition	Good
	Moisture Problems	None
	Spalling	None
	Efflorescence	None
	Masonry Joints	NA
	Rising Damp	None

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

	Cracks	Minor surface cracks visible at north wall
	Bulges	None
	Settlement	None
	Condition of Wood	Good to fair
	Other	
	Photograph #s	60, 61
Windows	Material	Glass, single pane glazing set into metal frame. Glass at cold frames on south side of greenhouse wings either missing or covered with plywood. 6/6 sash at north side of center frame bay between greenhouse wings.
	Condition	Good to fair. some
	Storm Windows	None
	Shutters	None
	Photograph #s	60, 61
Doors	Material	Wood, upper 9 light over panel to center block. Lower north wall has three garage bay openings with overhead garage doors, each with a row of lights and panels above and below.
	Condition	Good to fair.
	Storm Doors	None
	Photograph #s	60, 61
Cornice/Soffit	Material	Wood
	Condition	Good to fair
	Photograph #s	60, 61
Gutters	Material	Metal
	Condition	Good
	Photograph #s	61
Downspouts	Material	Metal
	Condition	Good
	Photograph #s	61
Roof	Material	Asphalt shingle
	Condition	Fair to good
	Photograph #s	60, 61
Chimney(s)	Material	Metal flue
	Condition	Good
	Photograph #s	61
Porches	Material	Central frame block has centered, hip roof porch supported by square wood posts.
	Condition	Good
	Photograph #s	60
Trees and Shrubs	Type	Overgrown evergreen bushes to either side of front entry. Vines have grown over wall of west

		greenhouse wing in need of pruning. See landscape plan
	Condition	Fair to poor
	Photograph #s	60, 61

General Comments:

The greenhouse was either built new or moved to Drumanard in 1972 from a previous location. The three-part building consists of a central frame block containing mechanical systems and open space, flanked by greenhouse bays to the east and west. The building is not used for its intended function. Condition of the mechanical equipment is unknown.

The greenhouse is considered a non-contributing building in both the National Register nominations because of its date of construction. It does, however, fit into Drumanard's overall plan, as a service building located to the north and out of sight of the residential area. A greenhouse would have been considered an integral component of the Country Estate building cluster.

*This baseline is only intended as a review of visual exterior and interior architectural and landscape components only and is not intended as an opinion regarding the structural integrity or environmental soundness of the premises.

INTERIOR CONDITION

The interior of the greenhouse is used for storage. Through the glass, the interior appears to be poorly maintained.

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Shed / Well house** **Building #3**
Date(s) of Construction	1929
Style	Tudor Revival
Material	Brick, stone, wood, slate, copper, metal
Features of Note	The wellhouse/shed is a one room, circular, one-story building with conical roof and cupola with bell tower. It is located in the southwest corner of the brick wall-enclosed courtyard of the service area. Access to the well, located in the center of the floor is covered.
Alterations(s)	none
Present Use	Storage for garden equipment, etc.
Photograph #	40, 53-55

EXTERIOR CONDITION

Foundation	Material	Formed concrete
	Condition	Good
	Photograph #s	53,54
Wall Type	Material	Brick masonry, six course common bond
	Condition	Good
	Moisture Problems	General damp conditions at front, north wall near entry.
	Spalling	One area of well house with spalling.
	Efflorescence	None
	Masonry Joints	good
	Rising Damp	Yes, see photographs
	Cracks	None
	Bulges	None
	Settlement	None
	Condition of	Fair, needs paint and maintenance at windows and

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

	Wood	doors
	Other	
	Photograph #s	2-1, 2-12
Windows	Material	Wood, two-light windows with stone sills in south, west and east sides of curved walls
	Condition	fair
	Storm Windows	none
	Shutters	None
	Photograph #s	53
Doors	Material	Wood, painted, 9-light over single panel. Brass knob.
	Condition	Fair, needs paint, minor repair
	Storm Doors	None
	Photograph #s	54
Cornice/Soffit	Material	Wood. Simple molding at eave beneath conical roof
	Condition	fair
	Photograph #s	53, 54
Gutters	Material	none
	Condition	
	Photograph #s	
Downspouts	Material	none
	Condition	
	Photograph #s	
Roof	Material	Slate shingle. Conical roof, 2/3 total height of building with decorative bell-shaped cupola with iron bell inside. Cupola supported by wood braces, copper flashing
	Condition	good
	Photograph #s	40,53-55
Chimney(s)	Material	none
	Condition	
	Photograph #s	
Porches	Material	none
	Condition	
	Photograph #s	
Trees and Shrubs	Type	The area surrounding the well house does not display evidence of formal planting.
	Condition	
	Photograph #s	

General Comments: This baseline is only intended as a review of visual exterior and interior architectural and landscape components only and is not intended as an opinion regarding the structural integrity or environmental soundness of the premises.

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Garage, chauffeur's apartment** **Building #2**
Date(s) of Construction	1929
Style	Tudor Revival
Material	Brick, limestone, wood, slate, formed concrete, copper, wrought iron
Features of Note	This service area includes the original garage with chauffeur's apartment and well house / shed. The buildings are connected by a brick masonry wall with limestone coping and quoined piers. The wall forms a courtyard with vehicle entry facing west to the house and gated pedestrian entry in the northeast corner. The area is located east of the main house kitchen area, on the opposite side of the entry drive.
Alterations(s)	Renovations ca 2006, include removal of the two north garage bays and replacement of the opening with three pairs of French doors, and a raised brick stoop. The French doors and stoop are not original. The interior was extensively renovated with the garage bays now containing a large room used as an office. The upper apartment was also extensively altered during this renovation.
Present Use	Office, apartment quarters
Photograph #	40-49

EXTERIOR CONDITION

Foundation	Material	Formed concrete
	Condition	Good
	Photograph #s	42,44,48,49
Wall Type	Material	Brick masonry, six course common bond
	Condition	Good
	Moisture Problems	Moisture due to damp and shade are evident on all walls, especially near grade. Mold / mildew covers lower walls especially on north gable end below

		grade.
	Spalling	None evident
	Efflorescence	On north wall
	Masonry Joints	Generally good
	Rising Damp	Possible below grade on north wall
	Cracks	None evident
	Bulges	None
	Settlement	None
	Condition of Wood	NA
	Other	
	Photograph #s	40-49
Windows	Material	All original with wood architrave and sash, single pane glass. Stone sills in masonry walls. At gable ends, soldier basket arches over first floor window with arched wood architrave. Splayed flat, gauged brick arches on second level gable ends. Dormer windows inset with wood architrave. Multi light 6/6 sash, fan light at entry, 6-lite casement at shed dormer.
	Condition	fair
	Storm Windows	None
	Shutters	None
	Photograph #s	40-47
Doors	Material	Wood, 9 lite upper above "X" paneled door with iron strap hinges.
	Condition	Good
	Storm Doors	None
	Photograph #s	41 –43, 48
Cornice/Soffit	Material	Wood, painted. The cornice is less important than at the main house; much less in detail and scale.
	Condition	Fair. Need general repair and maintenance including scrape, caulk, some replacement and paint.
	Photograph #s	45, 46
Gutters	Material	Copper, painted
	Condition	Fair to poor
	Photograph #s	45, 46
Downspouts	Material	Copper, painted
	Condition	Fair to poor
	Photograph #s	45, 46, 41
Roof	Material	Slate shingle
	Condition	Good to fair. In need of cleaning for removal of mold growth.

	Photograph #s	40 – 43, 45 - 46
Chimney(s)	Material	One, brick chimney at back of south side gable end. Corbelled cap
	Condition	good
	Photograph #s	41, 46
Porches	Material	NA
	Condition	
	Photograph #s	
Trees and Shrubs	Type	The area surrounding the garage does not display any evidence of formal planting. To the east (back) and north sides, vegetation has naturalized and resulting in damp and shade that fosters mold and moisture at the masonry walls.
	Condition	Poor, needs pruning and selective removal
	Photograph #s	40, 44 – 47, 49

General Comments:

The interior is not considered under this historic easement. Recent renovations to the garage at the exterior vehicle bays and the entire interior have diminished the building's physical integrity. However, integrity of location, most materials, workmanship, setting, feeling and association have been maintained and the garage remains a contributing building of Drumanard.

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INTERIOR CONDITION

The recent extensive renovation of the garage altered all interior areas with the exception of the south garage bay. The three pairs of French doors and brick stoop now at the three north garage bay areas are not original. The interior is in good to excellent condition, however the majority of historic interior materials have been removed. The interior is not included in this historic easement.

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Gazebo** **Building #4**
Date(s) of Construction	1929
Style	Tudor Revival
Material	Brick, stone, copper, slate, concrete, wood, iron
Features of Note	Picturesque, hexagonal, two level, gazebo with pointed, six-sided hip roof, chimney and interior fireplace, four large openings with iron railings and lower grade level for storage.
Alterations(s)	None
Present Use	Gazebo
Photograph #	56-59

EXTERIOR CONDITION

Foundation	Material	Formed concrete
	Condition	Good
	Photograph #s	
Wall Type	Material	Brick masonry, 6 course common bond
	Condition	Good
	Moisture Problems	Some minor moisture on north elevations at base
	Spalling	None
	Efflorescence	None
	Masonry Joints	Good
	Rising Damp	Some minor at grade
	Cracks	None
	Bulges	None
	Settlement	None
	Condition of Wood	good

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

	Other	
	Photograph #s	56-58
Windows	Material	Large openings in upper level enclosed with screens. Lower level has small, roung, multi-light hopper window. Wrought iron railing is set into the large openings, keeping an open view to the landscape beyond.
	Condition	Good
	Storm Windows	None
	Shutters	None
	Photograph #s	56-58
Doors	Material	Wood, 15 light single door with 5 light side lights at south facing entry of main level. One vertical wood with arch top to lower level
	Condition	fair
	Storm Doors	None
	Photograph #s	57
Cornice/Soffit	Material	Wood, plain frieze and molded crown
	Condition	Good
	Photograph #s	56, 58
Gutters	Material	None
	Condition	
	Photograph #s	
Downspouts	Material	None
	Condition	
	Photograph #s	
Roof	Material	Hexagonal pointed roof with little overhang, clad with slate shingles. Exposed, chamfered timber framing at interior. Large, decorative lamp hanging from apex.
	Condition	Generally good condition, but several roof slates have slipped from position.
	Photograph #s	56-58
Chimney(s)	Material	Brick masonry in north wall, corbelled cap
	Condition	Generally good, but the north face has some missing mortar.
	Photograph #s	56
Porches	Material	none
	Condition	
	Photograph #s	
Trees and Shrubs	Type	See formal garden
	Condition	
	Photograph #s	

EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

General Comments:

The gazebo is in generally good condition with the exception of some roof slates and a metal stair (see specific notes above and following) and appears to have been maintained at the soffit/eave. It is situated at the northeast corner of the formal garden, to the north of the house and directly west of the drive. The upper level is reached at grade of the garden while the lower level stands at grade of the drive.

(The exceptions to the generally good condition at the gazebo is a metal stair that is rusted and broken on the east side of the limestone wall to the southeast of the gazebo. This feature is shown in photo # 79, under the description of the formal garden.)

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EASEMENT BASELINE DOCUMENTATION
ARCHITECTURAL DATA – *Drumanard*

Date	April 1, 2010
Site #	JF 565
State	Kentucky
County	Jefferson
Town or Vicinity	Louisville
Historic Name	Drumanard / Drumanard Historic District / Strater-Watson Estate
Complete Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Owner	Soterion Corporation
Owner's Address	6401 Wolf Pen Branch Road Louisville, KY 40059
Building/ Structure # and Name	**Main house, building #1** NOTE: The house was not built on a cardinal direction axis. However, the orientation of the building for this baseline is as follows: front/south, left side/west, back/north, right side/east.
Date(s) of Construction	1929
Style	Tudor Revival
Material	Brick, limestone, wood, slate, formed concrete, copper, wrought iron
Features of Note	Picturesque, asymmetrical, Tudor revival residence sited at crest of hill and reached via winding driveway. Not visible from Wolf Pen Branch Road. 1929 stone date block in east wall of kitchen wing. Designed by Nevin & Morgan Architects, Louisville, KY. Single axis plan with front and rear facades enlivened by multiple bays, set backs irregular fenestration and roof lines.
Alterations(s)	Enclosed back porch (ca 2003)
Present Use	Residence
Photograph #	1-35

EXTERIOR CONDITION

Foundation	Material	Poured concrete. Cast metal vents at crawl space. Masonry goes to slightly below existing grade so foundation is not readily visible.
	Condition	Good
	Photograph #s	NA
Wall Type	Material	Brick masonry, American common bond 7-course on majority of house. Wall depth 18". Wood frame at back enclosed porch and front dining room bay. A variety of brick details at window and door heads include splayed flat, soldier brick lintels, some with stone keys; basket arches, and elliptical soldier arches. Cut stone sills

		canted out at all windows in good repair.
	Condition	Brick is in good condition. Residual white paint.
	Moisture Problems	None evident
	Spalling	None
	Efflorescence	None
	Masonry Joints	Original joints in good condition. Repairs at some windows have been made with concrete containing less aggregate than original mortar. Quality of repairs is inferior to original.
	Rising Damp	None
	Cracks	None
	Bulges	None
	Settlement	None
	Condition of Wood	All wood surfaces, including window architraves, soffit, eave moldings, porch trim, etc. are poorly maintained and in need of repair; scrape, caulk, paint.
	Other	
	Photograph #s	6, 7,10-12, 15, 17-19, 23-27
Windows	Material	Wood architrave and sash. All single pane glass (Stone sills, variety of brick lintels and arch heads.) Window types include: single and paired 6/6 and 4/4 sash with upper fixed sash; 6/6 sash with arched wood architrave; 4 light casements at attic; 9 light casements at gable ends; side-hinged, 4 light casements; three light, quarter round fan at attic. Modern transom windows over atrium doors at altered enclosed back porch.
	Condition	Fair
	Storm Windows	None
	Shutters	Original wood louvered shutters, dogs and latches generally poorly maintained. Several of the shutters are completely missing or are beyond repair and will need to be replaced. Many need to be re-attached. Most in need of repair, scraping, paint.
	Photograph #s	1-19, 23-24
Doors	Material	Wood. Front door is custom with four transom lights, rectangular and x-shaped panels, painted. Oversized, elaborate metal architrave with massive fluted pilasters, quoins, and broken pediment with volutes. Casement doors at west wing living room placed in front (south) and back (north) walls are set back into masonry wall with wood paneled

		recesses and stone sills. Doors are eight-light over single panel. Second level casement door above on the east side are four light over single panel set flush with brick. (On the west side, casement windows resemble the doors and are set over a fixed panel.) Kitchen ell doors are 1/2 muli-light over panels.
	Condition	Fair
	Storm Doors	None
	Photograph #s	2-4,
Cornice/Soffit	Material	Wood, painted. The cornice is an important detail that unifies the houses' asymmetrical bays. Extended cornice with molded edge and minimal frieze above molded architrave.
	Condition	Fair. Needs general repair including caulk, scrape, and paint.
	Photograph #s	18-26
Gutters	Material	Copper, custom half-round gutters affixed to eave with custom metal strapping.
	Condition	Fair to poor. Heavy paint build-up over copper. Photographs show some splitting and failure at joints. Some gutters are not functioning at all. Several have been bent or shifted so that water will spill out the front before reaching downspouts. Several damaged/crushed by falling libms. Generally poor maintenance with repairs needed.
	Photograph #s	18, 19, 25-27
Downspouts	Material	Copper
	Condition	Fair to poor. Heavy paint build-up over rectangular, custom copper downspouts. System originally piped to cistern. Downspouts set within masonry wall in front/south elevation of west block. Otherwise mounted to masonry with custom strapping. Photographs show splitting downspouts. Generally poor maintenance with repairs needed.
	Photograph #s	6, 26-27
Roof	Material	Slate shake
	Condition	Good to fair, no shakes appear to be missing. Some water damage in interior upper level of home (reported by owner but not viewed) may be due to failure of flashing at roof valleys or at gutter/cornice area.
	Photograph #s	3-13, 17, 23, 28
Chimney(s)	Material	Brick masonry. Three massive chimneys with corbelled caps on main axis. One chimney in north

		gable end of kitchen ell.
	Condition	good
	Photograph #s	2-5, 8-10, 13, 28
Porches	Material	Front entry: broken pediment architrave. Back porch off kitchen ell facing west to garden has painted metal, hipped canopy (possibly copper) with scalloped edge mounted on curvilinear iron brackets. Back/north kitchen: Original screened porch now enclosed on north and east sides by modern French doors with transom windows. Flat roof with decorative wood railing above. West side screened porch with large screen/glass paneled openings to south, west and north.
	Condition	Good to fair
	Photograph #s	5-9,12, 14-16, 23
Trees and Shrubs	Type	See baseline form "landscape" for details. Mature, formal plantings surrounding house. Ivy has become invasive at foundation.
	Condition	Ivy encroaches on brick and needs aggressive pruning.
	Photograph #s	1-34. See also landscape photos

General Comments:

In general, brick elements of the house are in good condition. The brick was probably painted white originally, a popular design detail of early-20th century Revival architecture. The intention was that the surface paint would eventually wear off, giving the house an aged and picturesque appearance.
While the brick is in good repair, the majority of wood details, including soffit, eave and window sash, are in need of general maintenance and selective repairs.
Similarly, the gutters and downspouts have been long under-maintained; several do not function.
There is evidence of groundhog activity adjacent to the house at the front/right quadrant (kitchen wing).
The condition of the original slate roof is unknown.

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INTERIOR CONDITION

Ceiling	Material	Plaster.
	Condition	good
	Photograph #s	30 -35
Ceiling Trim(s)	Material	Eliptical cove ceiling in front parlor. Heavy built up crown and dentil molding on first floor entry hall, parlor, side hall and dining room.
	Condition	Good
	Photograph #s	30-35
Walls	Material	Plaster in majority of rooms. Wood panel wainscoting, painted, at front entry hall. Original, finely detailed pine paneling in living room (west wing).
	Condition	Good
	Photograph #s	30-35
Wall Trim(s)	Material	Paneled wainscoting, painted
	Condition	Good
	Photograph #s	33-35
Floors	Material	Wood, ash, wide plank
	Condition	Good
	Photograph #s	33
Baseboards	Material	Tall, painted, pieced baseboard
	Condition	good
	Photograph #s	33
Interior Doors including Frames	Material	Wood paneled doors with built-up, shouldered architrave.
	Condition	Good
	Photograph #s	33, 35
Interior Windows including Frames	Material	Wood with built-up, shouldered architrave. Many set above raised panels. Several sash appear to be painted shut
	Condition	Good at interior, fair at exterior
	Photograph #s	32, 34
Staircases	Material	Wood. Located at back of center hall with full landing at back Palladian window (facing formal garden) and abbreviated reverse flight to second floor. Paneled wainscotting on outside wall. Wood treads and rail; painted risers and spindles.
	Condition	Good
	Photograph #s	29, 30

Fireplaces and Mantels	Material	Federal revival motifs. Dining room and study mantles painted. Unpainted pine in living room.
	Condition	good
	Photograph #s	31, 34
Hardware	Material	Brass door knobs and lock sets
	Condition	good
	Photograph #s	32
Mechanical systems	Material	unknown
	Condition	unknown
	Photograph #s	NA
Other	Material	
	Condition	
	Photograph #s	
Other	Material	
	Condition	
	Photograph #s	

General Comments:

The interior is not considered under this historic easement. However, general integrity of materials, design and workmanship are excellent in the public, first level areas of the house including the front hall, parlor, dining room, hallways and living room. The den walls, paneled similarly to the living room, are painted a dark brown. Recently, the kitchen area, back ell containing family room and back stair, and east side porch have been renovated.

The owners stated there was some minor water damage upstairs but this was not viewed.

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Drumanard / Drumanard Historic District / Strater-Watson Estate
JF 565
April 1, 2010

APPENDIX

General Comments

I. Original Documentation and National Register Nomination

In 1988, Drumanard (aka Mrs. A.M. Watson House, Strater House, Fitzhugh House) was listed on the National Register of Historic Places (Keys 1988). The nomination (included in this APPENDIX) identified the property containing 55 acres with three group of resources: a designed historic landscape, and English garden and a collection of Tudor-Revival-style residential buildings designed by the Louisville architectural firm, Nevin and Morgan. Drumanard included seven contributing buildings, three contributing structures, two contributing objects, four contributing sites and one non-contributing structure as follows:

Buildings
- Main dwelling, #1
- Garage with chauffeur's apartment, #2
- Well house (garden storage shed), #3
- Gazebo, #4
- Gardener's Cottage, #5
- Gardener's Garage, #6
- Greenhouse, #7

Structures
- Entry gates
- Service court wall and gates
- Interior roadway

Objects
- Statuary
- Pond fountain

Sites
- Designed historic landscape
- Woods
- Formal Garden

II. 1998 Country Estates of River Road (CERR) Historic District documentation

In 1998, Drumanard was included in the Country Estates of River Road Historic District (Brooks 1998). Portions of that nomination pertaining to Drumanard are included in this APPENDIX. The CERR nomination reiterated much of the original information

by Keys with the following modifications:

The greenhouse is identified as a non-contributing building (construction date, 1972).

III. Additional Research and Existing Conditions at Drumanard

Since the first and second nominations involving Drumanard, alterations to and removal of buildings, sites and objects, inspection of historical aerial photographs and research at the Frederick Law Olmsted National Historic Site Archives (Brookline, MA) suggest considering the following revisions prior to placing a conservation and historic preservation easement on the property.

Garage and chauffeur's apartment

In 2005, the present owners undertook an extensive renovation of the 1929, three-bay garage/apartment. Alterations to the exterior, front elevation include removal of the two north (left) garage bays and doors; incorporation of the separate bays into one large opening filled with three sets of residential French doors with transom lights. A continuous brick stoop fronts the doors. Interior changes include alteration of the garage bays into a large office/gathering room and renovation of the upstairs apartment into a guest quarter.

Despite these alterations to the main facade, the exterior of the garage maintains integrity of setting, feeling, workmanship, association and location, and a majority of material and design qualities. An historic preservation easement should consider the garage a contributing building of the property and limit additional alterations to the exterior.

Gardener's cottage

Since listed on the National Register in 1988 as a contributing building of Drumanard, the gardener's cottage has undergone extensive interior and exterior renovations that have completely compromised the historical integrity of the building. The renovation, begun some time prior to 2003 by the present owners was never completed. Since at least 2004, the building has stood open, in midst of renovation. It is not habitable.

The gardener's cottage is a non-contributing building of Drumanard. A conservation and preservation easement should not include this building.

Gardener's garage

The present garage/shed does not appear to be the historic building documented in

the 1988 nomination. The existing shed with pole frame and vertical board siding, while similar to the original in design, materials and location, is built of re-used and new dimensional lumber and siding.

The gardener's garage is a non-contributing building of Drumanard. A conservation and preservation easement should not include this building.

Olmsted Designed Landscape and Formal Garden

Research at the Olmsted Archive cast light on the history and evolution of the historic landscapes at Drumanard. A memo prepared by Jim Klein, ASLA (Lardner/Klein Landscape Architects, P.C., landscape architect for LSIORBP Section 4) concerning Landscape Preservation Easements on Drumanard is included in this APPENDIX. Landscape plans prepared by the Olmsted office for Drumanard date to 1904/05 for the original conceptual plan, 1905 for the original planning plan, and additional projects in 1927-8, and 1963-4. Klein's research suggests five distinct landscape areas. A sketch map following shows the five areas defined in the Klein memo including:

Entry drive
West lawn
East garden terrace (north/back of residence)
East garden and glade (north of house by creek)
Woodlands

Original plantings from the 1905 Olmsted plan (scans following) "have matured and in some cases are in serious decline. However, the original design concepts are still readily visible and easily recognized especially along the entry drive and east garden/glade. The west lawn was maintained for views and is still maintained as open views, although the Ohio River can no longer be seen, as it once was in the original 1904 photograph." (Klein 2006).

Entry drive
photos 69, 70, 81

The entry drive was established ca 1905, modified in 1927 when the main residence was built, and modified again in 1963 with some realignment and widening. Despite the interior drive following the Olmsted plan in concept and not in actuality, and documented non-historic alteration, the driveway design fits with the land contours, provides framed views to foreground and background landscapes, and offers glimpses to the main residence before ending in a circle at the front entry.

West Lawn
Photos 82, 83, 89

The 1904-5 design indicates key vistas with directional arrows that identify these open, framed views from the residence. These open views have been generally adhered to in plantings and mowing. The Olmsted plan however, shows a different axis alignment for the residence with panoramic views to the west. In reality, the house was built on an east-west axis

East Garden Terrace
Photos 58, 74-78, 80

This landscape feature is identified in National Register nominations as the formal garden designed by Arthur Cowell ca 1928. Olmsted records show the original Cowell

garden was extensively altered in 1963 by Olmsted. Historic photographs included with this report show that any formal plantings from the Cowell plan were very overgrown by 1963 and essentially screened the formal garden/pool area. This vegetation was almost entirely removed in the 1960s according to the Olmsted documents and photographs. The original dry-laid limestone walls, pool, and location of the formal garden are considered all that remain of the original Cowell plan.

Sometime before the 1963 Olmsted work, mortared limestone walls, piers and wrought iron fencing were added to the formal garden. These features show in the Olmsted photographs but it is evident that they more recent than the original, dry-laid limestone walls and steps in the garden.

During the past two years, the present owners installed an in-ground swimming pool to the north and east of the main residence (photo 89). The pool is a non-contributing structure.

Despite these significant changes, the formal garden retains a majority of its integrity simply by its association, feeling, location and setting and does contribute to the significance of Drumanard's landscape. An easement should retain these qualities of the formal garden, and might allow removal of the non-historic mortared walls and fencing in favor of dry-laid limestone walls similar to the remaining original structures.

East garden and glade
photos 81, 84-88

This area, north of the residential complex, contains glade, mature trees and the creek and should be included in an easement as it continues to represent the planting design style of the Olmsted office and landscape aesthetic of the Country Estate. This area marks the northern boundary of the Olmsted plan and landscape.

Woodlands
photos 53, 69. 90

The woodlands identified by Klein are not those north of the gardener's cottage that slope toward Highway 42, but are the buffering woods to the front (south), west side (concealing Drumanard from the residential subdivision on the west), and east side (between Drumanard and the Edward Strater House to the east). These woods contain native and naturalized species and contribute to the landscape intent and plan of the Country Estate.

Garden Statuary

The statuary counted as a contributing object in the 1998 nomination no longer exists.

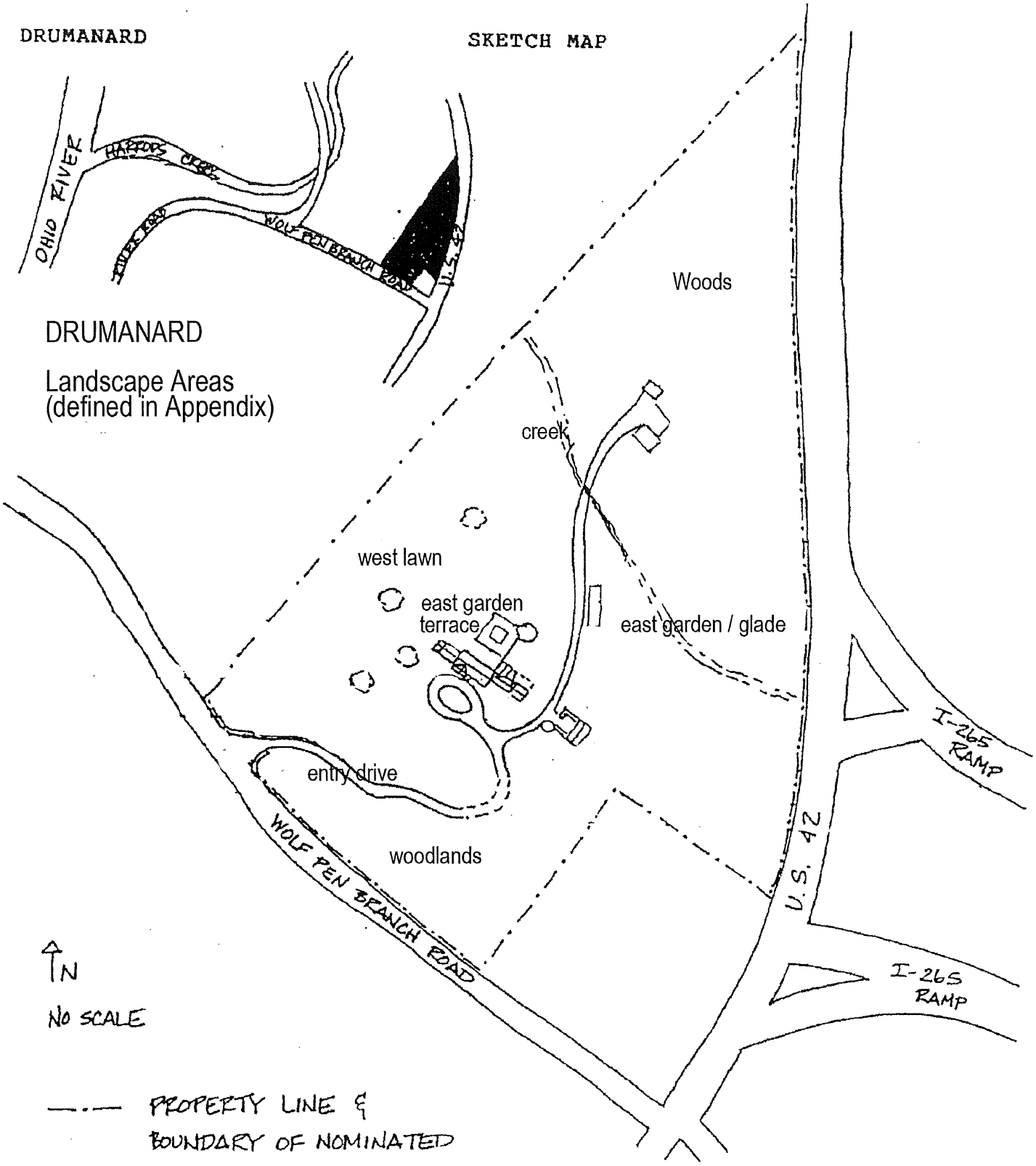
Fountain

The fountain, counted as a contributing object in the 1998 nomination and located in the pool of the formal garden no longer exists.

Woods
Photos 66, 91

The woods to the rear of the property, north of the gardener's cottage and shed, was identified in the 1988 and 1998 nominations as a contributing historic site. While this area is part of the original Drumanard parcel, the area's historic use was as crop land and pasture. The 1937 aerial shows it is alternating forest, pasture and crop fields from the north and west of the gardener's building area. Today the area is densely and indiscriminately vegetated with shrubs, vines and deciduous trees. While this area is within the National Register boundary, the (north) woods were not a part of the Olmsted's original plan for Drumanard.

Comparison of 1937 aerial with present conditions

A scan and enhancement of the 1937 aerial indicates improvements at Drumanard at that time. Evident changes over the past seventy years include abandonment of the clay tennis court, (now very overgrown with no features evident) and abandonment of crop fields and pasture areas to the northeast (now overgrown with volunteer trees and scrub vegetation). Of special note, there is no boundary between the 1929 house at Drumanard (W.E. Strater house) and the Edward Strater House (JF 564) to the east. The latter house was moved from its original location where the Drumanard house now stands, to its present location when the Nevin & Morgan house was built in 1928-9. A path linking the two houses is very evident in the 1937 aerial.

DRUMANARD SKETCH MAP