Barton & Loguidice, D.P.C.

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Dutchess County Dept. of Public Works
Engineering Division

DATE: July 23, 2014

FROM: Robert J. Sipzner, P.E., Vice President
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SUBJ: Final Design Approval Document
Bridge C-31 (BIN 3342880) Replacement
Hibernia Road over the East Branch of Wappinger Creek

A. Executive Summary

In accordance with our Scope of Services, Barton & Loguidice, D.P.C. (B&L) is pleased to provide herein the Final Design Approval Document for the replacement of Bridge C-31 (BIN 3342880), Hibernia Road over the East Branch of Wappinger Creek, in the Town of Clinton, Dutchess County. Based on field reconnaissance and review of record information, the proposed structure was evaluated for feasible alternatives that meet the project objectives and current design standards. This memorandum will assess the existing conditions and needs of the project site, identify the project objectives, establish the design criteria, analyze potential alternatives for structure replacement and evaluate the environmental effects resulting from implementation of the recommended alternative.

B. Conditions and Needs

This project is being developed to replace the bridge that carries Hibernia Road over Wappinger Creek (BIN 3342880). The structure is in need of complete replacement due to significant deterioration of the steel superstructure and concrete substructures. The bridge currently carries a NYSDOT Computed Condition Rating of '4.422' and a General Recommendation of '4' based on the Biennial Bridge Inspection completed on April 26, 2013. The existing steel floorbeams are exhibiting localized section loss up to 45%, resulting in the issuance of a Yellow Flag (No. 8I130009) by NYSDOT. The bridge abutments and wingwalls also exhibit moderate to heavy concrete spalling up to six inches deep with exposed steel reinforcement.

1. **Structure:** New York State Department of Transportation (NYSDOT) Bridge Inventory records indicate that the bridge was originally constructed in 1949. The existing bridge consists of a single span, non-redundant thru-girder superstructure with a steel grate deck. According to record plans, the superstructure is supported on concrete gravity abutments, founded on rock. Available record information of the structure and field survey indicate the following controlling dimensions for this structure:

    - Span Length – 63 feet
    - Total Bridge Length – 68 feet
    - Curb-to-Curb Width – 22.67 feet
    - Out-to-Out Width – 25.8 feet

2. **Highway Approaches:** Hibernia Road, in the vicinity of the structure, is a Local Rural Road with uncontrolled access. The roadway approaches to the west and east of the bridge carry two nine foot wide travel lanes with undefined shoulders that vary in width from zero to 1.5 feet.

Immediately adjacent to each end of the bridge, the existing roadway pavement width is approximately 21 feet (9 foot lanes, 1.5 foot shoulders), however, approximately 100 feet east and west of the bridge, the roadway width reduces to 18 feet (9 foot lanes, no shoulders). The roadway width of the proposed bridge (9 foot lanes, 2 foot shoulders) would meet current design standards (see section D for additional information) and would be consistent with the adjacent roadway segments of Hibernia Road.

The horizontal alignment of Hibernia Road, on the west approach to the bridge, lies on a series of horizontal curves with a minimum radius of 100 feet. The bridge is located on a tangent segment of highway that extends across the bridge to a horizontal curve on the east approach with a radius of 250 feet. The vertical roadway alignment to the west of the bridge consists of steep tangent grade of 10.10%. The bridge lies on a tangent vertical grade of 4.25 %, however there are sag vertical curves on both approaches which result in a minimum stopping sight distance of 92 feet. The roadway geometrics (horizontal curve radii, vertical grade, stopping sight distance) do not meet current standards (see Section D); however, improving the roadway geometrics to meet current standards is outside the scope of this bride replacement project. The highway reconstruction limit under this project will be limited to the area disturbed during construction of the bridge and will begin approximately 75feet west and extend to 75 feet east of the bridge.

Surface runoff of the roadway approaches currently drain transversely off the pavement, down the embankments and into the Wappinger Creek. The roadway drainage patterns will remain unchanged by this project; however drainage improvements will be implemented during construction. Also, the replacement bridge will utilize curb-less details allowing runoff from the bridge to pass directly into the Wappinger Creek.

There is existing w-beam guide railing on west bridge approach and box beam guide railing on the east bridge approach. The existing steel thru-girders extend above the bridge deck surface and serve as bridge railing/barrier on both side of the structure. The project proposes to replace the existing approach railing and provide three-rail steel bridge railing in order to provide railing that meets current NYSDOT standard for length, transition and termini.

3. **Traffic Volumes:** Existing traffic count data was obtained for Hibernia Road from the Poughkeepsie-Dutchess County Transportation Council via the Dutchess County website. The most recent traffic data (dated June 19, 2012) for the segment of Hibernia Road from County Route 13 (Clinton Corners Road) to Hibernia Spur was utilized to establish traffic volumes at the bridge. Forecasted traffic volumes were derived for the estimated time of completion (ETC) of the project (2015) and the ETC+30 design year (2045). The design year of ETC+30 was selected per Appendix 5 of the NYSDOT Project Design Manual (PDM) for bridge reconstruction projects. Between 2005 and 2012, traffic counts along this segment of Hibernia Road decreased from 239 to 231 vehicles/day, however for purposes of this project, the forecasted traffic volumes are based on a conservative growth factor of 0.5%/year. Using the 2012 traffic count data (231 vehicles/day), the assumed growth factor was applied each year to order to determine the estimated traffic volumes at ETC (234 vehicles/day) and ETC+30 (272 vehicles/day).

4. **Accident History:** An accident analysis was performed for the project area, in accordance with the HDM Chapter 5, for a 5-year period from January 2008 to November 2013. The study area included the segment of Hibernia Road between County Route 13 (Clinton Corners Road) and State Route 82. During this period, four (4) accidents were reported within the study limits, with two (2) occurring on Hibernia Road. Of the accidents reported, it was determined that none

were the result of the existing road or bridge geometry or any other factors that could be improved as a result of this project.

5. **Hydraulics:** The hydraulic conditions for this bridge replacement project were evaluated based on the Flood Insurance Study (FIS) conducted by the Federal Emergency Management Agency (FEMA). The FEMA countywide study for Dutchess County, including the Town of Clinton (Community # 361334), dated May 2, 2012, used the US Army Corp of Engineers (USACE) HEC-2 step-backwater computer program for the hydraulic analysis. A review of the FIS Flood Profile of the East Branch of Wappinger Creek in the vicinity of the bridge shows that the bridge has more than two feet of freeboard during the 50 and 100-year storms events, which meets the NYSDOT recommends a minimum of two (2) feet of freeboard during the 50-year storm. Furthermore, the water level of the East Branch of the Wappinger Creek in the vicinity of the project site is controlled by a dam located approximately 150 feet upstream of the bridge, therefore, any hydraulic improvements at the bridge site would result in only marginal reductions to the backwater elevations during flood events. The replacement structure proposes to improve the hydraulic capacity of the bridge by increasing the open area underneath the bridge. This would be facilitated by increasing the span length and/or the low chord elevation, resulting in the reduction of water surface elevations upstream of the bridge during high flow storm events.

6. **Geotechnical/Foundations:** Two (2) soil borings were progressed at the project site and were advanced to depths of 22 feet (Boring B-1) and 27 feet (Boring B-2) below the roadway surface. Both borings indicate a fill material from the roadway surface to a depth of approximately 10 feet. Boring B-1 encountered a red weathered rock from a depth of approximately 12 feet to 17 feet. At a depth of 17 feet, Boring B-1 encountered a hard Argillite bedrock with an RQD of 70%. Boring B-2 encountered a similar weather rock from a depth of 10 feet to 24 feet and a hard Argillite bedrock was encountered at a depth of 24 feet.

   Record information and site investigations indicated that the existing concrete substructures are founded on spread-on-rock footings. Current NYSDOT policy requires that structures over waterways either A) be founded on sound rock b) be supported by deep foundations (piles) or c) provide positive protection to prevent scour of the substructure. The bridge replacement alternatives considered propose a spread-on-rock (Alternative 1) or a pile supported foundation (Alternative 2). See sections E and F for a detailed description of the recommended foundation type for each bridge alternative.

7. **Utilities**: There are existing overhead utilities that extend along the north side of Hibernia Road and cross the creek adjacent to the north fascia of the existing bridge. Utility relocations would be required to complete the bridge replacement. The existing utility pole located on the northeast bridge approach (Central Hudson Gas & Electric, No. 4047 P), would need to be relocated to facilitate the reconstruction of the bridge abutments and wingwalls. Overhead electric lines, which run parallel to the downstream bridge fascia, may also need to be de-energized or relocated during construction.

   Underground utilities are not known to exist within the project limits. Additionally, field survey indicates the presence of a raised concrete well structure located at 433 Hibernia Road in the north-west quadrant of the bridge. It is not known if this is an active water supply well, however, if active, the well will need to be relocated as part of this project.

8. **Work Zone Traffic Control:** During construction, the existing bridge would be closed and a temporary off-site detour route would be established. The anticipated detour route length is approximately 2.5 miles and includes Hibernia Road, County Route 13 (Clinton Corners Road) and New York State Route 82.

C. Project Objectives

The following project objectives have been established based on the Conditions and Needs described above:

- Eliminate all structural deficiencies by providing a new structure designed to current structural and safety standards that provides a 75-year service life in a manner that is cost effective and environmentally sensitive.

- Maintain or increase the hydraulic capacity of the existing structure.

D. Design Criteria

The design criteria for this project has been developed in accordance with the NYSDOT Highway Design Manual (Chapter 2) and the NYSDOT Bridge Manual (4th Edition, Section 2). As a Local Rural Road, the following design criteria apply to Hibernia Road in the vicinity of the bridge.

Critical Design Elements			
PIN:	N/A	NHS (Y/N):	N
Route No. & Name:	Hibernia Road	Functional Class:	Local Rural
Project Type:	Bridge Reconstruction	Design Classification (AASHTO Class)	Local
% Trucks:	32%	Terrain:	Rolling
AADT: (ETC + 30)	272 vpd	Truck Access Rte.:	N

	Element	Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions
1	Design Speed (85th Percentile)	40 mph	2.7.4.1. A	30 mph	
2	Lane Width	9 ft.	2.7.4.1.B	9 ft.	9 ft.
3	Shoulder Width	2 ft.	2.7.4.1.C	varies 0 – 1.5 ft.	2 ft.
4	Bridge Roadway Width Total = Travel Lane = Shoulder =	 22.0 ft. 9.0 ft. 2.0 ft.	BM Section 2, Appendix A, Table R	 22.67 ft. 9.0 ft. 2.33 ft.	 22.0 ft. 9.0 ft. 2.0 ft.
5	Maximum Grade	10.0%	2.7.4.1.E	10.10%*	10.10%*
6	Horizontal Curvature	485 ft. (@ e = 6.0%)	2.7.4.1.F	100 ft.*	100 ft.*
7	Superelevation Rate	8% (Max.)	2.7.4.1.G	Varies	2.0%
8	Stopping Sight Distance	360 ft. (min.)	2.7.4.1.H	92 ft.*	96 ft.*
9	Horizontal Clearance Without barrier = With Barrier =	 6.0 ft. > of Shoulder Width or 4.0 ft.	2.7.4.1.I	 4.5 ft.* 2.0 ft.*	 4.5 ft.* 2.0 ft.*
10	Vertical Clearance	2 ft. (freeboard)	BM Section 2.4	2.50 ft.	2.50 ft.
11	Pavement Cross Slope Travel Lanes =	 1.5% (Min.) 2.0% (Max.)	2.7.4.1.K	Varies	1.5% (Min.) 2.0% (Max.)
12	Rollover Between travel lanes = At edge of traveled way =	 4.0% (Max.) 8.0% (Max.)	2.7.4.1.L	Varies	4.0% (Max.) 8.0% (Max.)
13	Structural Capacity	HL-93	BM Section 2.6	15 Tons (Posted)	HL-93
14	Pedestrian Accommodations	Highway Shoulders	HDM Ch. 18 & ADAAG	Highway Shoulders	Highway Shoulders

*Denotes Non-Standard Features

E. Alternatives Considered

Two (2) feasible alternatives have been investigated for this bridge replacement project. Under both alternatives, the proposed replacement superstructure consists of prestressed concrete box beams (33 inch depth) with a composite concrete deck (6 inch depth). The new structure would accommodate a 22 foot roadway width and an out-to-out width of 25.33 feet (9 ft. travel lanes, 2 ft. shoulders and provisions for railings). The proposed structure under either alternative would be constructed without curbs, allowing surface water to drain transversely from the bridge.

The following alternatives have been considered for this project;

Alternative 1 – Prestressed Concrete Box Beam Units with Conventional Abutments

Alternative 1 consists of replacing the bridge at the existing span length of 63 feet and a total bridge length of 66 feet. The proposed adjacent box beam superstructure would be supported on conventional cast-in-place abutments and wingwalls with spread footings founded on rock. Structural approach slabs would be constructed at both ends of the bridge utilizing jointless bridge details. Three-rail bridge railing would be installed along the fascias of the new bridge. The approach work would consist of full depth pavement reconstruction, installation of bridge transition railing and end sections, highway drainage improvements, driveway reconstruction and site restoration. The estimated construction cost for Alternative 1 is $850,000, see preliminary cost estimate in Appendix A.

The replacement structure under this alternative is within the existing bridge foot print, which limits the disturbance to adjacent private properties, however minor Right-of-Way (ROW) acquisitions, in the form of permanent and temporary easements, will still be necessary to complete the work. This alternative would require full removal of the existing substructures and excavation to the depth of sound rock. Due to the varying rock elevations encountered during the soil borings, the excavation depths to sound rock could exceed 20 feet and, in order to maintain access and limit disturbance to adjacent properties, temporary soldier pile and lagging walls would need to be constructed in the north-west and south-east quadrants of the bridge. Additionally, the sound rock elevations may be located more than 5 feet below the stream bed elevation, therefore construction of cofferdams for water diversion would be required.

Alternative 2 – Prestressed Concrete Box Beam Units with Integral Abutments

Alternative 2 consists of replacing the existing bridge with an increased span length of 80 feet and total bridge length of 83 feet. The proposed precast concrete superstructure would be supported on cast-in-place concrete, integral abutments founded on micropiles. The micropiles would be pre-drilled to and socketed into sound rock. Structural approach slabs would be constructed at both ends of the bridge utilizing jointless bridge details. Three-rail bridge railing would be installed along the fascias of the new bridge. The approach work would consist of full depth pavement reconstruction, installation bridge transition railing and end sections, highway drainage improvements, driveway reconstruction and site restoration. The estimated construction cost for Alternative 2 is $790,000, see Appendix A for the preliminary cost estimate.

Based on the results of the subsurface investigation, it is recommended that pre-drilled micropiles be utilized for this bridge alternative. The soil borings encountered a five to ten foot thick layer of hard, weathered rock above the elevation of sound bedrock. Due to the very dense nature of the weathered rock, driven piles (steel or concrete) would be very difficult and costly to install to the desired minimum depth without incurring significant damage to the pile. The proposed micropiles would be pre-drilled in order to ensure that the piles are socketed an adequate distance into sound bedrock.

The replacement structure under this alternative would include short wingwalls that are in-line with the abutments, however the proposed wingwalls would still be located within the existing bridge foot print, which limits the disturbance to adjacent private properties. Minor Right-of-Way (ROW) acquisitions, in the form of permanent and temporary easements, will be necessary to complete the work. This alternative would place the new abutments approximately ten feet behind the existing abutments and would retain the lower portion of the existing abutments, therefore limiting the excavation depth to approximately 10 feet. The lower portion of the existing abutments would remain in place to serve as cofferdams during construction and to retain the stone fill and provide additional scour protection for the replacement structure.

F. Recommended Alternative

Alternative 2, Prestressed Concrete Box Beam Units founded on Integral Abutments is the recommended alternative based on hydraulic performance, ease of construction and cost. Under both alternatives, the existing low chord elevation would be increased, resulting in hydraulic improvements at the bridge site. Construction of integral abutments behind the existing abutment locations under Alternative 2, results in a more significant increase in hydraulic capacity of the structure due to the increased clear span length. Furthermore, the portions of the existing abutments to remain provide additional scour protection for the new bridge.

The use of integral abutments simplifies the construction process and reduces construction duration. By design, integral abutments can be constructed more cost effectively and in a shorter duration compared to conventional abutments. Also, due to the varying elevations of sounds rock, construction of spread-on-rock footings (Alternative 1) would require deep excavation along with construction of cofferdams and temporary excavation protection systems (soldier pile and lagging wall). Additionally, construction of a stepped footing to follow the varying rock profile would be costly and time consuming. The use of an integral abutment (Alternative 2) would require a much shallower excavation depth, thus eliminating the need for a temporary excavation protection system and allowing he lower portion of the existing abutments to remain in place and serve as cofferdams during construction. Also, the use of pre-drilled micropiles would easily accommodate the varying rock profile while ensuring that the piles are installed an adequate distance into sounds bedrock.

Life cycle costs of the structure are reduced for an integral abutment structure due to the jointless construction and the elimination of associated maintenance costs. For this particular project, additional construction cost savings are recognized by leaving portions of the existing abutments in place, resulting in reduced costs associated with substructure removals, structure excavation and temporary construction measures, including cofferdams and solider pile and lagging walls.

The recommended alternative will retain four (4) non-standard features, as identified in the design criteria table in Section D. The improvement of non-standard features including, maximum grade, horizontal curvature, stopping sight distance and horizontal clearance, is outside the scope of this bridge replacement project. Improvement to these non-standard features would require roadway realignment, resulting in significant increases in construction costs, environmental impacts and Right-of-Way takings. Due to the close proximity of residences and driveways to the bridge, it may not be feasible to improve each non-standard feature to fully meet standards, even after significant roadway realignment. Retention of these non-standard features is justified based on the factors discussed above.

The proposed plan, profile and typical sections for the recommended alternative are included in Appendix B.

G. Environmental Considerations

1. State Environmental Quality Review Act (SEQRA)

The proposed project involves the replacement of an existing bridge structure on the same alignment. The project has been reviewed in accordance with the SEQRA and it has been determined that the project is a Type II Action. As such, no further review under SEQRA is required.

2. Surface Waters

The East Branch of Wappinger Creek, included in the Wappinger Creek Drainage Basin, is mapped as the 101st Tributary to the Hudson River by the NYS Department of Environmental Conservation (NYSDEC) and is recognized as Water Index Number H-101-21 (6 NCRR § 857). Within the limits of the project, the East Branch of the Wappinger Creek is designated as a Class B water with B Standards. Class B waters are included in the definition of protected streams in 6 NYCRR § 608 – Use and Protection of Waters. According to 6 NYCRR § 701.7, the best usages of Class B waters are primary and secondary contact recreation and fishing. Such waters are suitable for fish, shellfish, and wildlife propagation and survival.

The East Branch of the Wappinger Creek does not meet the definition of a federal or state navigable waterway, regulated under Section 10 of the Rivers and Harbors Act and Article 15 of the Environmental Conservation Law (ECL), respectively.

3. Wetlands

A review of NYSDEC freshwater wetland mapping and the National Wetland Inventory (NWI) indicate there no state or federally regulated wetlands mapped within or adjacent to the project site. Additionally, B&L did not identify any unmapped wetlands during the environmental site visit, therefore no wetland permits will be required as part of this project.

4. Threatened/Endangered Species

B&L has completed a detailed assessment of threatened and endangered species within the project area. Based on site observations, correspondence with the Natural Heritage Program (NHP) and review of the U.S. Fish and Wildlife Service's (USFWS) online database, B&L has concluded that the proposed project will have "No Effect" on any federal or state endangered/threatened species in the vicinity of the project site. No further reviews or assessments are required, see attached Threatened and Endangered Species Memo (Appendix C) for additional information.

As outline in the Threatened and Endangered Species Memo the removal of adjacent trees will be necessary for this project and all tree removals will occur within the USFWS identified cutting window of October 31st to March 31st. During final design, B&L will identify specific trees to be removed by County forces.

5. Historic, Cultural, Archaeological Resources and Parklands

Pursuant to the SEQRA, the State Historic Preservation Office (SHPO) has reviewed the proposed project scope to determine potential impacts to archaeological, historic, or cultural resources within or adjacent to the project site. Based upon their review, the SHPO has determined that this project

will have "No Effect" upon cultural resources in or eligible for inclusion in the National Registers of Historic Places (see Appendix D for SHPO correspondence dated May 30, 2014). No further coordination related to historic or cultural resources is required.

The project is not located within a federal, state or local parkland. No further coordination related to parklands is required.

6. Hazardous Waste and Contaminated Materials

A Hazardous Waste/Contaminated Materials Site Screening has been conducted in accordance with NYSDOT's The Environmental Manual, Chapter 5, in order to document the likely presence or absence of hazardous/contaminated environmental conditions. B&L has concluded that the presence of hazardous or contaminated materials is likely limited to lead-based paint on the steel girders. The Contract Documents for the bridge replacement will include the appropriate provisions for proper containment, handling and disposal of lead-based paint. Additional information regarding the identified material and proposed mitigation can be found in the attached Hazardous Waste and Contaminated Materials Report (Appendix E).

7. Asbestos

In accordance with New York State Department of Labor (NYSDOL) Industrial Code Rule No. 56, an asbestos screening has been performed at the project site. The asbestos survey was completed by B&L, during which one (1) asbestos containing material (ACM) was identified. The pipe used to construct the bridge weep holes was found to contain asbestos and will need to be removed in accordance with NYSDOT Blanket Variance – 14. The Contract Documents for the bridge replacement will include the appropriate provisions for proper removal, handling and disposal of the ACM, in accordance with the requirements of the Blanket Variance. Additional details regarding the indentified ACM and proposed mitigation can be found in the Asbestos Report (Appendix F).

8. Permits

The completion of this bridge replacement project will require environmental permitting from both the NYSDEC and U.S. Army Corps of Engineers (USACE). As a protected water body, a NYSDEC Article 15 Stream Disturbance Permit must be required for any work that will be performed within the bed and/or banks of the creek. As part of the permit conditions, it is anticipated that in-stream work associated with this project will be subject to timing restrictions, with such work to be accomplished only from May 1st through September 30th. Any disturbance to the bed and banks of the stream will also require a USACE Section 404 Nationwide Permit #3 (Maintenance) and subsequently a NYSDEC Section 401 Water Quality Certification.

The proposed project will result in less than one (1) acre of soil disturbance, therefore a NYSDEC State Pollution Discharge Elimination (SPDES) General Permit for Construction Activities (GP-0-10-001) and a project specific Storm Water Pollution Prevention Plan (SWPPP) will not be required.

A highway work permit will be required from the NYSDOT for the placement of detour signage along State Route 82.

9. Ground Water

NYSDEC aquifer GIS data files have been reviewed and it has been determined that the proposed project is not located in an identified Primary Water Supply or Principal Aquifer Area.

A review of the EPA-designated Sole Source Aquifer Areas Federal Register Notices, Maps and Fact Sheets indicates that the project is not located in a Sole Source Aquifer Project Review Area. No federal review and/or approvals are required pursuant to Section 1424 (e) of the Safe Water Act.

10. Floodplains

The project is located in in a mapped Floodplain as shown on the FEMA Flood Insurance Rate Map (FIRM) for the Town of Clinton (Map #361334). The FIRM indicates that the project site in located in an established flood Zone AE.

An evaluation of the potential effects of the proposed action within the floodplain has been considered in order to avoid any adverse effect to the floodplain. While the proposed project does require the use of floodplain in order to complete the bridge replacement, the area of encroachment has been minimized and the proposed replacement bridge provides an improvement to the hydraulic conditions at the project site. Therefore, there will be no significant impacts or adverse effects to the floodplain resulting from this project.

11. Coastal Zone Management

The proposed project is not located in a State Coastal Zone Management (CZM) area, according to the Coastal Zone Area Map from the NYS Department of State's Coastal Zone Management Unit.

12. Noise

The project does not result in a significant change to the vertical or horizontal alignments of the roadway or an increase in the number of through-fare traffic lanes, therefore a detailed noise study is not required in accordance with FHWA guidelines. A temporary increase in noise levels may occur during construction, however no long-term noise impacts are anticipated to result from the project.

13. Air Quality

The project has been evaluated in accordance with the NYSDOT Environmental Manual, to determine if an air quality analysis is required. The initial screening determination for air quality is based on overall intersection or corridor Level of Service (LOS) for the project area. As a low volume road, Hibernia Road, in the vicinity of the project, has a LOS rating of C or better for the existing and future conditions, therefore, no further air quality analysis is required for this project.

14. Energy

Based on the scope of the bridge replacement, the project will not significantly impact energy utilization, therefore a detailed energy analysis is not required.

15. Farmlands

Based on a review of the NYS Agricultural District Maps for Dutchess County, the proposed project is not located within any mapped Agricultural Districts.

16. Visual Impacts

The proposed project is located in Dutchess County in the Town of Clinton. The project area is mainly surrounded by private residences and wooded properties. The major visual features of the

project corridor are the; 1) roadways, 2) private residences and 3) wooded properties. Additional visual features include the East Branch of the Wappinger Creek.

The proposed alterations to the existing view sheds would result in a positive effect to the visual landscape. The visual elements that will be most altered would be the existing roadway. These roadways, in themselves, are of low visual quality, and the project would cause no significant impacts to the views along these roadways. Also, the location and views of the creek and the surrounding properties would be unchanged by the project. A detailed Visual Impact assessment is not required for this project.

17. Critical Environmental Areas

According to information obtained from NYSDEC, the proposed project does not involve work in or near a Critical Environmental Area.