

impacts will be short-term (lasting only for the duration of the construction period) and will generally stem from the operation of construction equipment, truck traffic, earth-moving vehicles and equipment, jackhammers and structure erection equipment (cranes) etc. The type of equipment used and operations performed to install the Project facilities is expected to be typical of a large-scale construction effort. In general, the highest noise level from this type of equipment is approximately 92 dB(A) at the immediate source. The operation of the Project along this route will not result in any permanent adverse noise impacts, or create new sources of long-term noise generation.

5.3.3.2.3 Comparison of Noise Impacts

The Preferred Northern Route traverses more developed and industrial/commercial areas, as well as two of the most industrialized cities in western Massachusetts. The ambient sound levels along this route would be greater than the less-developed, more rural areas traversed by the Noticed-Alternative Southern Route. Although the operation of the Project along either route will not result in any permanent adverse noise impacts, or create new sources of long-term noise generation, the potential noise impacts of overhead transmission line construction activities, though temporary in nature, will be greater on the Noticed-Alternative Southern Route.

5.3.3.2.4 Mitigation Measures

Elevated noise levels generated during construction will be temporary. Where feasible, construction work adjacent to commercial or industrial areas will be scheduled at night time, whereas work near residential areas would typically be performed during the daytime (when human sensitivity to noise is lower). Taking into consideration the factors that could result in an increase in sound levels and could cause annoyance at noise-sensitive sites, procedures will be applied during construction to minimize noise effects at sensitive sites. Engine-powered construction equipment will be properly muffled and maintained to minimize excessive noise. Such equipment will not be permitted to operate or idle unnecessarily near noise-sensitive sites. In areas where blasting or rock hammering is required (e.g., to install foundations for overhead line structures), efforts will be made to schedule or muffle blasts to minimize noise and vibration disturbances.

5.3.4 Visual and Aesthetics

The existing environment and impacts and mitigation measures for the Preferred Northern Route and the Noticed-Alternative Southern Route are in the following subsections.

5.3.4.1 Existing Environment

The existing visual and aesthetics for the Preferred Northern Route and the Noticed-Alternative Southern Route are summarized below.

5.3.4.1.1 Preferred Northern Route

The Preferred Northern Route follows WMECO's existing transmission line ROWs through a variety of predominantly suburban and urban land uses that are typical of the Greater Springfield Area. The existing visual environment in the vicinity of the route is influenced by the presence of the existing 115-kV overhead transmission lines that were installed approximately 30 to 80 years ago, as well as by the type of land use development in the surrounding areas. The existing overhead 115-kV transmission lines along the route are configured on a variety of structure types. These existing structures include 65- to 95-foot-high wood-pole H-frames, steel monopoles that range between 85 and 95 feet in height, and lattice steel towers that range between 70 and 100 feet in height. Portions of the existing corridors also contain distribution lines constructed on wood poles of about 40 feet in height or on lattice steel towers that were used in the past for 69-kV lines.

There are no designated scenic areas in the vicinity of the Preferred Northern Route. The visual environment in areas along the route that may otherwise be considered as potentially scenic, such as the Connecticut River, is already influenced by the presence of the existing 115-kV overhead lines.

Sensitive receptors for the Preferred Northern Route are the same receptors as would be considered sensitive receptors for noise and are set forth above in Table 5-10, above. Visual simulations for the Preferred Northern and Noticed-Alternative Southern Routes are located in Exhibit 5.1. For the Preferred Northern Route, the photo simulations are associated with Cross Sections XS-3 through XS-17.

5.3.4.1.2 Noticed-Alternative Southern Route

The existing ROWs along which the proposed 345-kV overhead lines would be located are currently occupied by existing 115-kV and/or 345-kV transmission lines, configured on a variety of structure types. These existing structures include 80- to 95-foot-high wood-pole H-frames, steel monopoles that range between 90 and 100 feet in height, and lattice steel towers that range between 80 and 95 feet in height. Portions of the existing corridors also contain distribution lines constructed on wood poles of about 40 feet in height or on lattice steel towers that were used in the past for 69-kV lines.

Sensitive receptors for the Noticed-Alternative Southern Route are the same receptors as would be considered sensitive receptors for noise and are set forth above in Table 5-11, above. Visual simulations for the Noticed-Alternative Southern Route are located in Exhibit 5.1, and are associated with Cross-Sections XS-S01 through XS-S09 (not including XS-S05 and XS-S07, which relate to the portion of the route in Connecticut.)

5.3.4.2 Impacts and Mitigation

The impacts and mitigation for visual and aesthetics of the Preferred Northern Route and the Noticed-Alternative Southern Route are summarized below.

5.3.4.2.1 Preferred Northern Route and Related Facilities

In order to accommodate 345-kV overhead lines within the ROW, taller transmission structures will be constructed. This will be the primary visual impact along this route. The ROW will continue to be utilized for overhead transmission facilities, but the visual character of the area will experience modest changes. The visual changes along each segment of the Preferred Northern Route are summarized in Table 5-12. For each segment, the summaries describe the modifications to the structures, the change in the height of the structures along the segment, the effects on the wooded buffer, the number of residences within 100 feet of the ROW and the proximity of schools and other notable, visually sensitive facilities.

Table 5-12: Summary of ROW and Structure Visual Changes: Overhead Portion of Preferred Northern Route⁵

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
CT/MA Border to Existing Deadend Structure 2249	0.2	65 feet to 75 feet	H-frame 85 feet to 100 feet	<p>The existing line on lattice-steel structures would remain and a new 345-kV line would be added on a single line of H-frame structures. The taller H-frames would be more visible at some locations. Existing ROW would require some vegetation removal on the eastern side to accommodate the new line.</p> <p>See: XS-3. Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights, ranging from a 10' – 35' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and agricultural area would be decreased. Residences within 100 feet of the edge of the ROW from MA/CT border to Structure 2249: 0
Existing Deadend Structure 2249 to Existing Angle Structure 2252	0.3	65 feet to 75 feet	Monopole 125 feet to 130 feet	<p>The existing line on lattice-steel structures would be removed and replaced with a 345/115-kV line using steel monopoles. The taller steel monopoles would be more visible at some locations. Existing ROW would require some vegetation removal on the south side to accommodate the new line.</p> <p>See: XS-4. Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 50' – 65' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and agricultural area would be decreased. Residences within 100 feet of the edge of the ROW from Structure 2249 to South Agawam: 2

⁵ Note: ROW vegetation removal widths identified are conservative and are indicated as if all vegetation is forestland. Little or no removal would be required in areas where the ROW traverses land uses (e.g., cropland, orchard, lawns, pasture, landfill and other non-woodland land areas) that are compatible with transmission line construction and operation or where terrain permits spans of certain vegetation. This table addresses potential long-term visual changes along the overhead portion of the Project.

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
Existing Angle Structure 2252 to Existing Angle Structure 2267	1.7	65' - 75'	Monopole 125 - 130'	<p>The existing line on lattice-steel structures would be removed and replaced with a 345/115-kV line using steel monopoles. The taller steel monopoles would be more visible at some locations. Existing ROW would be expanded by 10 feet on the southeast side with associated vegetation removal.</p> <p>See: XS-5, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to change in structure heights ranging from a 50 feet to 65 feet increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. • Wooded buffer between ROW and residential areas would be decreased. • View of ROW from golf course would be increased. • Residences within 100 feet of the edge of the ROW from Structure 2252 to Structure 2267: 11
Existing Angle Structure 2267 to South Agawam S/S	0.6	65' - 75'	Monopole 120 - 145'	<p>The existing line on lattice-steel structures would be removed and replaced with a 345/115-kV line using steel monopoles. The taller steel monopole would be more visible at some locations. Existing ROW would be expanded by 10 feet on the west side with associated vegetation removal.</p> <p>See: XS-6, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to change in structure heights ranging from a 45' – 80' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from Structure 2267 to South Agawam: 1
South Agawam S/S to Silver S/S	0.9	60' – 70'	Two monopoles 80' - 115' and 115' - 145'	<p>The existing line on lattice-steel structures would be removed and replaced with a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The taller steel monopoles would be more visible at some locations. Existing ROW would require some vegetation removal to accommodate the new lines.</p> <p>See: XS-7, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to change in structure heights ranging from a 10' – 85' increase. The tallest structures would be required only at road crossings, hilly topography, and to span

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
				<p>waterbodies.</p> <ul style="list-style-type: none"> • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from South Agawam S/S to Silver S/S: 1
<p>Silver S/S to Existing Structure 2286</p>	<p>0.5</p>	<p>65' – 80'</p>	<p>Two monopoles 100' – 110' and 125' – 145'</p>	<p>The existing distribution line would be relocated within the ROW as required. The existing line on lattice steel structures would be removed and replaced by a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW would be expanded by 35 feet on the west side with associated vegetation removal.</p> <p>See: XS-8, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to change in structure heights ranging from a 20' – 80' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from Silver S/S to Structure 2286: 4
<p>Existing Structure 2286 to Agawam S/S</p>	<p>1.9</p>	<p>65' – 80'</p>	<p>Two monopoles 100' – 110' and 125' – 145'</p>	<p>The existing distribution line would be relocated within the ROW as required. The existing line on lattice steel structures would be removed and replaced by a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW would require some vegetation removal to accommodate the new lines.</p> <p>See: XS-9, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to change in structure heights ranging from a 20' – 65' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. • Wooded buffer between ROW and residential areas would be decreased. • Views of ROW from Agawam High School (approximately 500 feet west of the lines) would be increased.

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
				<ul style="list-style-type: none"> Residences within 100 feet of the edge of the ROW from Structure 2286 to Agawam S/S: 16
<p>Agawam S/S to Piper S/S</p>	<p>3.6</p>	<p>65' – 100'</p>	<p>Two monopoles 85' – 145' and 120' – 160'</p>	<p>The existing distribution lines would be relocated within the ROW as required. The existing lines on lattice steel structures would be removed and replaced by a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The existing lattice structures would be removed and replaced by a 115-kV single circuit monopole and a 345/115-kV composite monopole. The taller structures would be more visible at some locations. Existing ROW would require some vegetation removal to accommodate the new lines.</p> <p>See: XS-10, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 0' – 95' increase. The tallest structures would be required at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Views of ROW from West Springfield High School (approximately 800 feet east of the lines) and West Springfield Middle School (approximately 500 feet west of the lines) would be increased. Residences within 100 feet of the edge of the ROW from Agawam S/S to Piper S/S: 95
<p>Piper S/S to Chicopee S/S</p>	<p>3.5</p>	<p>65' – 100'</p>	<p>Two monopoles 75' – 150' and 80' – 145'</p>	<p>The existing distribution lines would be relocated within the ROW as required. The existing lines on lattice steel structures would be removed and replaced by a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW is already cleared for its full width; little or no removal of vegetation would be needed.</p> <p>See: XS-11, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 0' – 80' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Views of ROW from Massachusetts Turnpike would increase.

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
				<ul style="list-style-type: none"> Residences within 100 feet of the edge of the ROW from Piper S/S to Chicopee S/S: 87
<p>Chicopee S/S to East Springfield Junction.</p>	<p>0.7</p>	<p>80' – 90'</p>	<p>Two monopoles 95' – 130' and 120' – 145'</p>	<p>The existing line on lattice-steel structures would be removed and replaced by a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW is already cleared for its full width; little or no removal of vegetation would be needed.</p> <p>See: XS-12, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 5' – 50' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from Chicopee S/S to East Springfield Junction: 10
<p>East Springfield Junction to Existing Structure 49091</p>	<p>1.5</p>	<p>85' – 90'</p>	<p>Two monopoles 100' – 120' and 125' – 145'</p>	<p>The existing line on lattice-steel structures would be removed and replaced by a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW would be expanded by 25 feet on the south side with associated vegetation removal.</p> <p>See: XS-13, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 10' – 60' increase. The tallest structures would be required at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Wooded buffer between ROW and Massachusetts Turnpike would be decreased. Residences within 100 feet of the edge of the ROW from East Springfield Junction to Structure 49091: 4

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
Existing Structure 49091 to Exit 6 Junction.	1.0	90'	Two monopoles 75' – 120' and 115' – 145'	<p>The existing line on steel monopoles would be removed and replaced by a 115-kV single-circuit line and a 345/115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW would require some vegetation removal on the southern side to accommodate the new lines.</p> <p>See: XS-14, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 0' – 55' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and Massachusetts Turnpike would be decreased. Residences within 100 feet of the edge of the ROW from Structure 49091 to Exit 6 Junction: 0
Exit 6 Junction to Shawinigan S/S	0.3	90'	Two monopoles 50' – 105' and 115' – 135'	<p>The existing line on steel monopoles would be removed and replaced by a 345-kV single-circuit line and a 115-kV single-circuit line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW would require some vegetation removal on the southern side to accommodate the new lines.</p> <p>See: XS-15, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 0' – 45' increase. The tallest structures would be required at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from Exit 6 Junction to Shawinigan S/S: 2
Shawinigan S/S to Orchard Junction.	1.4	50' – 90'	Two monopoles 90' – 150' and 110' – 155'	<p>The existing lines on wood-pole structures and steel monopoles would be removed and replaced by a 345/115-kV line and a double-circuit 115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW would require some vegetation removal on the southern side to accommodate the new lines.</p> <p>See: XS-16, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 0' – 105' increase. The tallest structures would be required only at road

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
				<p>crossings, hilly topography, and to span waterbodies.</p> <ul style="list-style-type: none"> Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from Shawinigan S/S to Orchard Junction: 31
Orchard Junction. to Ludlow S/S	4.8	50' – 90'	Two monopoles 70' – 130' and 105' – 155'	<p>The existing distribution lines would be relocated within and outside the ROW as required. The existing lines on wood-pole structures and steel monopoles would be removed and replaced by a 345/115-kV line and a double-circuit 115-kV line, each using steel monopoles. The taller structures would be more visible at some locations. Existing ROW is already cleared for its full width; little or no removal of vegetation would be needed.</p> <p>See: XS-17, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 0' – 105' increase. The tallest structures would be required at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from Orchard Junction to Ludlow Substation: 28

5.3.4.2.2 Noticed-Alternative Southern Route

Similarly, visual impacts along the Noticed-Alternative Southern Route will be the long-term change due to taller transmission structures. Likewise, the ROW will continue to be utilized for overhead electricity transmission, but the visual character of the area would experience an incremental change due to the taller structures.

The visual changes along each segment of the Noticed-Alternative Southern Route are summarized in Table 5-13. For each segment, the summaries describe the modifications to the structures, the change in the height of the structures along the segment, the effects on the wooded buffer, the number of residences within 100 feet of the ROW and the proximity of schools and other notable facilities. The portion of the Preferred Northern Alternative that would be in common with Noticed-Alternative Southern Route (CT/MA Border to South Agawam Switching Station) is represented in the first four rows of Table 5-13.

Table 5-13: Summary of ROW and Structure Visual Changes: Overhead Portion⁶ of Noticed-Alternative Southern Route⁷

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
CT/MA Border to Existing Deadend Structure 2249	0.2	65 feet to 75 feet	H-frame 85 feet to 100 feet	<p>The existing 115-kV line on lattice-steel structures would remain and a new 345-kV line would be added on H-frame structures. The taller H-frames would be more visible at some locations. Existing ROW would require some vegetation removal on the eastern side to accommodate the new line.</p> <p>See: XS-3. Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights, ranging from a 10' – 35' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and agricultural area would be decreased. Residences within 100 feet of the edge of the ROW from MA/CT border to Structure 2249: 0
Existing Deadend Structure 2249 to Existing Angle Structure 2252	0.3	65 feet to 75 feet	Monopole 125 feet to 130 feet	<p>The existing line on lattice-steel structures would be removed and replaced with a 345/115-kV line on steel monopoles. The taller steel monopole would be more visible at some locations. Existing ROW would require some vegetation removal on the south side to accommodate the new line</p> <p>See: XS-4. Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 50' – 65' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and agricultural area would be decreased. Residences within 100 feet of the edge of the ROW from Structure 2249 to South Agawam: 2

⁶ This table does not include the Connecticut portion of the Project.

⁷ **Note:** ROW vegetation removal widths identified are conservative and are indicated as if all vegetation is forestland. Little or no removal would be required in areas where the ROW traverses land uses (e.g., cropland, orchard, lawns, pasture, landfill and other non-woodland land areas) that are compatible with transmission line construction and operation or where terrain permits spans of certain vegetation.

This table addresses potential long-term visual changes along the overhead portion of the Project.

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
Existing Angle Structure 2252 to Existing Angle Structure 2267	1.7	65' - 75'	Monopole 125 - 130'	<p>The existing line on lattice-steel structures would be removed and replaced with a 345-kV line on steel monopoles. The taller steel monopoles would be more visible at some locations. Existing ROW would be expanded by 10 feet on the southeast side with associated vegetation removal.</p> <p>See: XS-5. Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to change in structure heights ranging from a 50 feet to 65 feet increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. • Wooded buffer between ROW and residential areas would be decreased. • View of ROW from golf course would be increased. • Residences within 100 feet of the edge of the ROW from Structure 2252 to Structure 2267: 11
Existing Angle Structure 2267 to South Agawam S/S	0.6	65' - 75'	Monopole 120 - 145'	<p>The existing line on lattice-steel structures would be removed and replaced with a 345/115-kV line on steel monopoles. The taller steel monopoles would be more visible at some locations. Existing ROW would be expanded by 10 feet on the west side with associated vegetation removal.</p> <p>See: XS-6, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to change in structure heights ranging from a 45' – 80' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from Structure 2267 to South Agawam: 1
<p>Note: The Noticed-Alternative Southern Route description below begins at Agawam Substation and extends south to South Agawam Junction then southeast through Agawam to the MA/CT border</p>				
Existing Structure 2286 to Agawam Substation	1.9	65' - 80'	Two monopoles 125' – 145'	<p>The existing distribution line would be relocated within the ROW as required. The existing line on lattice-steel structures would be removed and replaced by two sets of 345/115-kV lines on steel monopoles. The taller structures would be more visible at some locations. Existing ROW would be expanded by 15 feet on the west side with associated vegetation removal.</p>

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
				<p>See: XS-S01, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 45' – 80' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from Structure 2286 to Agawam S/S: 16
<p>Silver S/S to Existing Structure 2286</p>	<p>0.5</p>	<p>65' – 80'</p>	<p>Two monopoles 125' – 145'</p>	<p>The existing distribution line would be relocated within the ROW as required. The existing line on lattice-steel structures would be removed and replaced by two sets of 345/115-kV lines on steel monopoles. The taller structures would be more visible at some locations. Existing ROW would be expanded by 65 feet on the west side with associated vegetation removal.</p> <p>See: XS-S02, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 45' – 80' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from Silver S/S to Structure 2286: 4
<p>South Agawam S/S to Silver S/S</p>	<p>0.7</p>	<p>65' – 80'</p>	<p>Two monopoles 125' - 145'</p>	<p>The existing line on lattice-steel structures would be removed and replaced by two sets of 345/115-kV lines on steel monopoles. The taller steel monopoles would be more visible at some locations. Existing ROW would require some vegetation removal to accommodate the new lines.</p> <p>See: XS-S03, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to change in structure heights ranging from a 50' – 65' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from South Agawam S/S to Silver S/S: 1

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
South Agawam Junction. to CT/MA border	1.8	80'	H-frame 70' - 120'	<p>One existing 115-kV line on wood-pole H-frame structure averaging 80 feet in height would remain and a new 345-kV line would be installed using H-frame structure averaging about 90 feet in height. The new structures will be placed south of and close to the existing H-frame locations. The ROW would require some vegetation removal to accommodate the new line.</p> <p>See: XS-S04, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to addition of extra H-frame structures with a 0' - 40' increase in height compared to existing structures. • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from South Agawam Junction to CT/MA border: 27
CT/MA border to CT/MA border (CT River)	1.1	75' – 215'	H-frame 70' - 120'	<p>One existing 115-kV line on wood-pole H-frame structures averaging 80 feet in height would remain, and a new 345-kV line would be installed using H-frame structures averaging about 90 feet in height. The new structures will be placed south of and close to the existing H-frame locations. The ROW would require some vegetation removal to accommodate the new line. The ROW would require some vegetation removal to accommodate the new lines.</p> <p>One existing and one proposed new steel structure at the crossing of the Connecticut River are approximately 215 feet in height due to the long span length over the river.</p> <p>See: XS-S05, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to addition of extra H-frame structures with a 0' - 40' increase in height compared to existing structures. • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from CT/MA border to CT River/CT/MA border: 2
CT/MA border (CT River) to MA/CT border	0.5	85' - 215'	H-frame 85' - 215'	<p>One existing 115-kV line on wood-pole H-frame structures averaging 80 feet in height would remain, and a new 345-kV line would be installed using H-frame structures averaging about 90 feet in height. The new structures will be placed south of and close to the existing H-frame locations. The ROW would require some vegetation removal to accommodate</p>

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
				<p>the new line. The ROW would require some vegetation removal to accommodate the new lines.</p> <p>One existing and one proposed new steel structure at the crossing of the Connecticut River are approximately 215 feet in height due to the long span length over the river.</p> <p>See: XS-S06, Exhibit 5.1</p> <ul style="list-style-type: none"> • High visual impact due to addition of extra H-frame structures. • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from CT River/CT/MA border to MA/CT border: 0
<p>MA/CT border to CT/MA border (Franconia Junction), all in CT</p>	<p>4.3</p>	<p>75' - 85'</p>	<p>H-frame 70' - 120'</p>	<p>One existing 115-kV line on wood-pole H-frame structures averaging 80 feet in height would remain, and a new 345-kV line would be installed using H-frame structures averaging about 90 feet in height. The new structures will be placed south of and close to the existing H-frame locations. The ROW would require some vegetation removal to accommodate the new line.</p> <p>See: XS-S07, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to addition of extra H-frame structures with a 0' - 45' increase in height compared to existing structures. • Wooded buffer between ROW and residential areas would be decreased. • Residences within 100 feet of the edge of the ROW from MA/CT border to MA/CT border/Franconia Junction: 36
<p>CT/MA border (Franconia Junction) to Hampden Junction</p>	<p>4.0</p>	<p>85' - 95'</p>	<p>H-frame 70' - 120'</p>	<p>One existing 115-kV line on steel-monopole structures averaging 90 feet in height would remain, and a new 345-kV line would be installed using H-frame structures averaging about 90 feet in height. The new structures will be placed south of and close to the existing steel-monopole locations. The ROW would require some vegetation removal to accommodate the new line.</p> <p>See: XS-S08, Exhibit 5.1</p> <ul style="list-style-type: none"> • Higher visual impact due to addition of extra H-frame structures with a 0' - 35' increase in height compared to existing structures. • Wooded buffer between ROW and residential

Project Segment	Miles	Height Range of Existing Structures	Height Range of Proposed Structures	Modifications/Visual Resource Change
				<p>areas would be decreased.</p> <ul style="list-style-type: none"> Residences within 100 feet of the edge of the ROW from CT/MA border/Franconia Junction to Hampden Junction: 4
Hampden Junction to Ludlow Substation	10.8	90' – 105'	Monopoles 125' - 145'	<p>One existing 345-kV line on wood-pole H-frame structures averaging 95 feet in height will remain, as will one existing 115-kV line on steel-monopole structures averaging 100 feet in height. A new 345-kV line would be built on the east side of the existing 345-kV line on steel-monopole structures averaging 130 feet in height. The new structures will support the line conductors in a vertical configuration. New structure placements will be close to existing structure locations.</p> <p>See: XS-S09, Exhibit 5.1</p> <ul style="list-style-type: none"> Higher visual impact due to addition of new monopole structures and associated change in structure heights ranging from a 20' – 55' increase. The tallest structures would be required only at road crossings, hilly topography, and to span waterbodies. Wooded buffer between ROW and residential areas would be decreased. Residences within 100 feet of the edge of the ROW from Hampden Junction to Ludlow Substation: 45

5.3.4.2.3 Comparison of Visual and Aesthetics Impacts

The Preferred Northern and Noticed-Alternative Southern Routes between Agawam Substation and Ludlow Substation are similar in terms of visual and aesthetic impact: both routes are along existing utility ROWs; both routes would involve the addition of taller poles; and both ROWs will remain exclusively in electric utility use. However, should the Noticed-Alternative Southern Route be selected, not only would taller 345-kV poles be placed on that route, but some of the taller new 115-kV line poles would also be needed as well as on the Preferred Northern Route in order to accommodate the 115-kV line re-builds.⁸ As a result, the visibility rating from Table 4-3 above shows the Preferred Northern Route with a superior rating of 40.4 compared to the Noticed-Alternative Southern Route rate of 62.6. The

⁸ Should the Noticed-Alternative Southern Route be selected for the new 345-kV transmission line, structures along the Preferred Northern Route for the 115-kV upgrade will be 15 – 30 feet taller than the existing structures.

Preferred Northern Route is superior to the Noticed-Alternative Southern Route with respect to minimizing potential visual impacts.

5.3.4.2.4 Mitigation Measures

It is unlikely that designated visually-sensitive areas will be affected long-term by the Project.⁹ Proposed activities will be located within previously established transmission corridors, near land areas occupied by commercial and industrial land uses, intermixed with residential development. While the change from 115-kV transmission lines to 345-kV transmission lines will result in the construction of taller transmission structures, the visual character of the area will be only modestly affected.

5.3.5 Wetlands and Vernal Pools

The existing environment and impacts and mitigation measures for the Preferred Northern and the Noticed-Alternative Southern Routes are in the following subsections.

5.3.5.1 Existing Environment

The existing wetland and vernal pools for the Preferred Northern Route and the Noticed-Alternative Southern Route are summarized below.

5.3.5.1.1 Preferred Northern Route

During 2007 and 2008, WMECO environmental consultants conducted field studies to map the type and extent of jurisdictional wetlands, watercourses, and waterways along the Preferred Northern Route for the GSRP facilities. Prior to the field work, desktop research was conducted to facilitate the delineation of freshwater wetlands, waterways, and vernal pools along the Project routes. The following resources were used to determine areas where wetlands and vernal pools would be particularly likely to be found along the GSRP area:

- U.S. Fish & Wildlife Service National Wetlands Inventory (NWI) Mapping
- MassDEP Wetlands Mapping
- USDA/NRCS Soil Surveys
- MassGIS and Natural Heritage and Endangered Species Program (NHESP) Certified and Potential Vernal Pools data layer

⁹ Although there are several hundred feet of woodland buffer between the historic Ludlow Center and the ROW, it is possible that the new taller structures may be visible from Ludlow Center.