Noise is generated primarily from three sources within a substation: the transformers; the transformer cooling fans; and the control house air conditioning units. An "Environmental Sound Assessment Study" ("Noise Study"), which is attached to this Section 5 as Exhibit 5.6, was conducted by WMECO for the modifications to the Agawam and Ludlow Substations, among others. The Noise Study at Table 5-5 shows little, if any, increase in ambient noise levels due to the modifications at the Ludlow Substation.

5.4.2 Agawam Substation

Agawam is an existing substation with a 115-kV switchyard. The proposed modifications at this substation will include constructing a new 345-kV switchyard to interconnect two 345-kV lines, two 345/115-kV autotransformers, space provisions for future 345-kV connections, a new 115-kV circuit-breaker bay, and a new control house. The existing fencing at the substation will be relocated approximately 65 feet to the north and 45 feet to the west for a total expansion of 45,000 square feet.

All of the proposed modifications will be located on WMECO property. The substation expansion (i.e., outside of the existing fenceline) will occur in an area that currently consists of developed and landscaped areas. There are no wetlands, watercourses, vernal pools, or Protected Species habitats in the vicinity of the proposed modifications.

The impacts and mitigation for the Agawam Substation are expected to be comparable to those described for the Ludlow Substation. Aerial diagrams of the modifications to the Agawam Substation are set forth in Exhibit 5.8. These modifications would have generally minor and highly localized environmental effects.

The modifications proposed to the Agawam Substation would have a minor, incremental effect on visual resources. The new 345-kV facilities would not appreciably alter the existing appearance of the station. The new 345-kV line terminal structures would be approximately 120 feet tall, which is taller in height than the existing structures at the station.

The Noise Study (Exhibit 5.6) at Table 5-3 shows little, if any, increase in ambient noise levels due to the modifications at the Agawam Substation.

5.5 OVERHEAD CONSTRUCTION METHODS AND SCHEDULE

The proposed Project facilities will be constructed in accordance with established electric utility practices, best management practices, final engineering plans, WMECO's specifications, and the conditions

specified in certificates and permits obtained for the Project. The following subsections describe the procedures that will be used to construct the Project facilities, identify the anticipated schedule for the Project construction, and provide an overview of the mitigation measures that have been identified to date with respect to construction procedures. Exhibit 5.9 contains illustrative photographs of construction activities.

5.5.1 Construction Methods

Prior to the commencement of construction, WMECO will complete pre-construction planning activities. In particular, WMECO will continue to consult with the municipalities, state agencies and federal agencies, and will conduct site-specific studies and surveys in order to design construction procedures for contractors that will minimize or avoid adverse effects to the environment and to the public. WMECO will construct the Project in several stages, some of which will overlap in time. During actual construction, certain work activities and sequences may vary, based on factors such as site-specific conditions, final Project designs, and the requirements of regulatory approvals.

Construction will typically consist of activities such as:

- Surveys to stake monumented line of corridor, ROW boundaries, and future structure locations
- Identification and marking wetland and watercourse boundaries
- Identification and marking areas of cultural resources areas of concern where avoidance or special procedures are required
- Identification and marking sensitive environmental resource areas to be avoided
- Establishment of field construction areas and preparation of staging and lay-down areas
- Preparation of ROWs (including the installation of erosion and sedimentation controls, removal of vegetation as needed, access road improvement/installation)
- Preparation of work areas (pads) at structure sites
- Excavation and installation of foundations and erection of new structures
- Installation of conductors and wires
- Removal of existing transmission line structures and associated conductors and wires
- Clean-up and restoration, including re-vegetation of disturbed sites

The following construction activities, materials, and equipment are generally expected to be involved in the construction of the overhead transmission lines on or adjacent to the existing or expanded transmission ROWs:

Table 5-27: Typical Construction Equipment and Procedures

Construction Phase	Typical Equipment/Materials Required
Establish erosion and sediment controls	• Pickup and other small trucks
Clear for new access roads or improve existing roads	• flatbed truck • brush hog • bulldozer • bucket trucks for canopy trimming • wood chipper • Side booms, forklifts and cranes to handle materials
Construction of new access road or improve existing roads to provide a travel way of at least 15 to 20 feet in width	• bulldozer or front loader • Pickup or stake body trucks for culverts, etc. • dump trucks for crushed stone or gravel • pickups or stake-body trucks for culverts • mat installer for wetland mats • Roads may be wood, gravel, or matted; using culverts or crushed stone for wet areas; roads may be temporary or permanent. Roads must have sufficient width and capacity for heavy construction equipment, both over-the-road and off-road vehicles, including oversize tractor trailers. The need for access for flatbed trailers and concrete truck often determines the scope of access road improvements. Road grades must be negotiable for over-the-road trucks; 10 percent maximum, and less if wet weather or surface conditions provide traction problems. Vehicles with tracks or tires are used.
Preparation of staging and lay down areas if they are to be off the ROW	• Same equipment for access road construction will be used. • Establish field office trailers, sanitary facilities, and parking areas, as well locations for material and equipment storage.
Preparation of work area at sites of existing and new structures	• Same equipment for access road construction and staging area preparation will be used. • Reel trailers to haul out old conductors • Trucks to haul out old hardware • Flatbed trucks with a crane to remove structures • Trucks with welding equipment to cut steel supports or components • Dump trucks to haul smaller components
Construction of new line structures	• Same equipment for access road construction and staging area preparation will be used with addition of caissons for foundations, flatbed trucks for structure components, auger, excavator, cranes, other trucks for reinforcing rods, concrete trucks for structures requiring concrete pads or foundations, bucket trucks and hardware, conductor reels, and conductor pulling rigs. Dump trucks are needed for the foundation work if excess excavated material has to be removed from the ROW. In wet conditions or if groundwater is encountered, the water is pumped to a temporary settling basin with erosion and sedimentation controls including geotextile fabric, silt fence, hay bales and crushed stone. As with all other activities, this would have to comply with any applicable regulation.
Removal of existing line structures	• Bucket trucks for dismantling existing lines, with reel trailers to capture and store old conductors, trucks to remove old hardware, flatbed truck with crane to remove structures, trucks with welding equipment to cut steel supports or components, stake or dump trucks to remove smaller components. To minimize wetland impacts or to access structures with

Construction Phase	Typical Equipment/Materials Required
	challenging topography, helicopter may be used for removal.
Restoration	• Pickup and other small trucks. • All debris is to be removed from the ROW for disposal; but brush may be piled, scattered, or chipped. Disturbed ground is back bladed to its preconstruction contours unless directed otherwise. If the work site is in an agricultural field, the soil can be decompacted by disking. Erosion controls are left in place until vegetation is established. Steep areas are stabilized with jute netting or pre-made erosion control fabric containing seed, mulch, and fertilizer. Access roads where culverts or crushed stone fords were installed will be left in place or removed as directed by the regulatory authorities in accordance with permit/certificate conditions.

5.5.1.1 Project Schedule

The projected construction schedule for the installation of the proposed facilities along the Preferred Northern Route is between the third calendar quarter of 2010 and the first calendar quarter of 2013. Construction of the new 345-kV line and the upgrade to the 115-kV lines along this corridor will occur at the same time.[21]

The projected construction schedule for the development of the 345-kV transmission line along the Noticed-Alternative Southern Route also would be between the third quarter of 2010 and the third quarter of 2013. In order to achieve this construction schedule, construction activities will occur simultaneously on both the southern corridor as well as the 115-kV northern corridor. Based upon preliminary evaluations, there would be minimal changes to the construction sequence or duration if the Noticed-Alternative Southern Route is selected.

5.6 NOTICED-ALTERNATIVE SOUTHERN ROUTE - SUMMARY COMPARISON OF UNDERGROUND AND OVERHEAD 345-kV VARIATION

As an option for placing one of the two proposed 345-kV overhead lines underground, an in-ROW underground line route alternative (UG-South 02E) was analyzed between South Agawam Switching Station and Agawam Substation (see Section 4.6.7.) Because this 345-kV underground line route option follows the same route later identified later in Section 6.2.2 and evaluated in Section 7.2.2 of this document, the full evaluation is not repeated here. The results of the impacts analysis in Section 7.2.2

[21] This is without regard to any undergrounding of the 115-kV lines which are described as alternatives in Section 6 herein. The underground alternatives are likely to cause delay in the completion of the Project.