

and Fairmont Switching Station. The 1602 and 1603 lines will share a common double-circuit monopole structure in this section.

- Re-build the 115-kV Piper – Agawam 1230 circuit on single-circuit monopole structures.
- Re-build the 115-kV Chicopee – Agawam 1314 circuit for approximately 7.1 miles. The circuit will share double-circuit monopole structures with the new 345-kV Ludlow – Agawam circuit.
- Re-build the 115-kV Agawam – Silver – South Agawam 1782 circuit on single-circuit monopole structures.
- Re-build the 115-kV Agawam – Silver – South Agawam 1781 circuit for approximately 3.0 miles. The circuit will share double-circuit monopole structures with the new 345-kV Agawam – North Bloomfield circuit.
- Relocation of existing distribution poles in six locations in Agawam, and removal of distribution poles in two locations in Chicopee. These modifications to existing distribution structures will be conducted within the limits of existing ROW, and will facilitate construction of the proposed 345-kV and 115-kV system improvements.
- Re-configure the existing 115-kV transmission system between the South Agawam Switching Station and the Southwick Substation in western Massachusetts, forming a single South Agawam to Southwick 115-kV circuit 1768 with no connections to North Bloomfield Substation.
- Re-build the Agawam portion of the new 115-kV Southwick – South Agawam 1768 circuit for approximately 2.5 miles. This portion of the circuit will share double-circuit monopole structures with the new 345-kV Agawam to North Bloomfield circuit.
- Utilize the existing 115-kV line sections for approximately 0.6 miles between the new Cadwell Switching Station and the East Springfield Substation for two new Cadwell to East Springfield circuits.
- Leave normally open a 115-kV bus-tie circuit breaker at the Breckwood Substation to split the substation and install a circuit switcher to normally bypass the existing series reactor on the 1322 circuit. The open bus-tie breaker will automatically close upon and during the outage of either 115-kV circuit.
- Replace limiting circuit breakers and terminal equipment at the Agawam and Ludlow Substations and at the Shawinigan Switching Station.

2.1.4 Switching Stations and Substations

WMECO will need to modify several existing switching station and substations to support the operation of the new 345-kV transmission line and re-built 115-kV transmission lines. The Project includes two

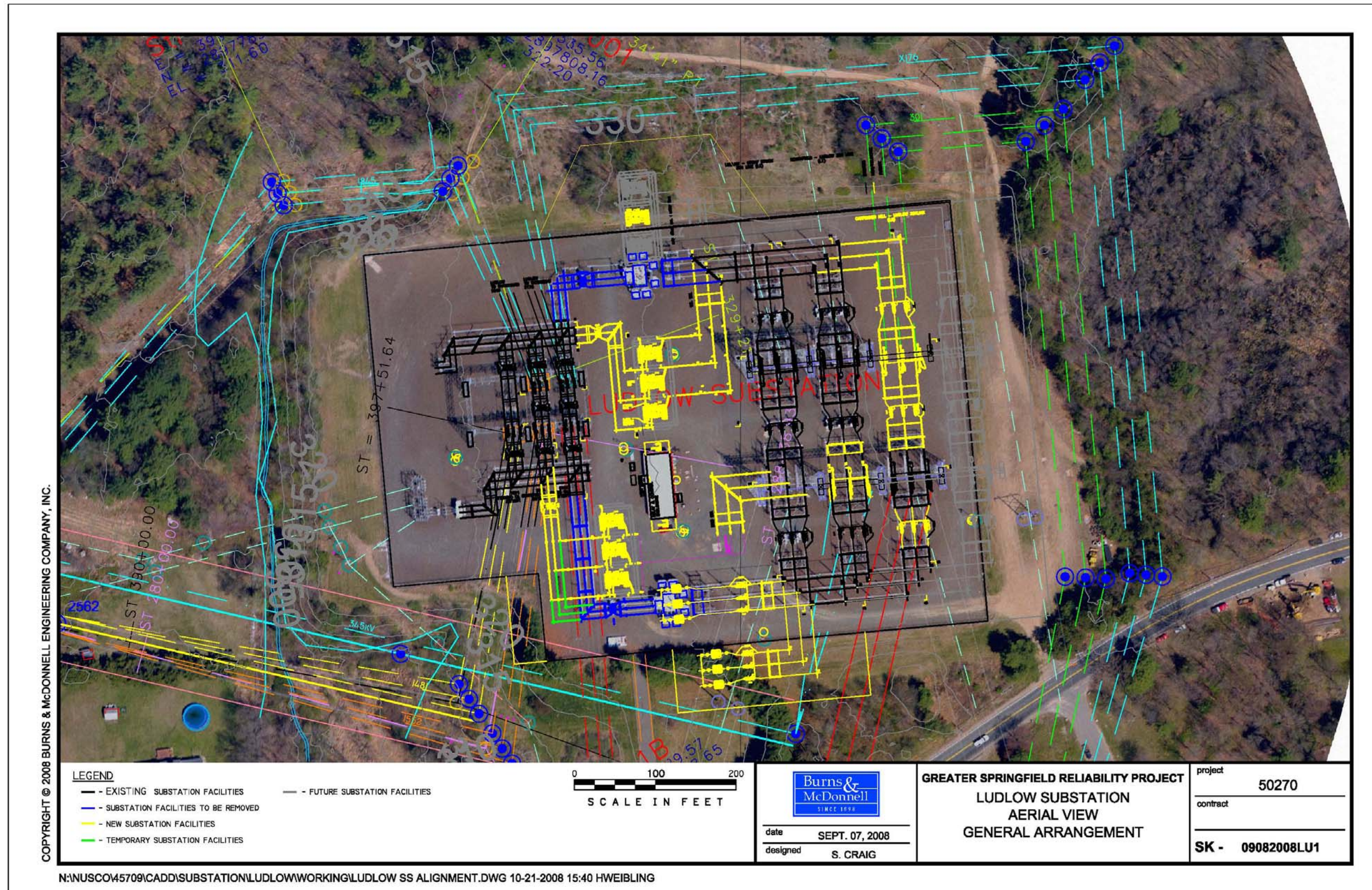
new switching stations and modifications to existing substations and switching stations as described in the following subsections.

2.1.4.1 Modifications to Ludlow Substation

Ludlow is an existing substation with 115- and 345-kV switchyards, as well as 23-kV facilities. The proposed modifications, shown on Figure 2-3 below, to this substation include the removal and replacement of each of two existing three-phase autotransformers using single-phase units, the addition of a new bay of 345-kV circuit breakers to interconnect the Agawam-Ludlow transmission circuit, and the replacement of several 115-kV circuit breakers. There will also be two 120-MVAR capacitor banks installed.

Existing access to the Ludlow Substation is via Center Street. Facing Rock Wildlife Management Area is located to the north of and adjacent to the parcel of land owned by WMECO. The construction of the modifications will take place within WMECO property but outside the existing fence line and away from the wildlife management area. There are no wetlands, watercourses, vernal pools, or Rare Species habitat in the immediate vicinity of the proposed work.

Figure 2-3: Ludlow Substation



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2.1.4.2 Modifications to Agawam Substation

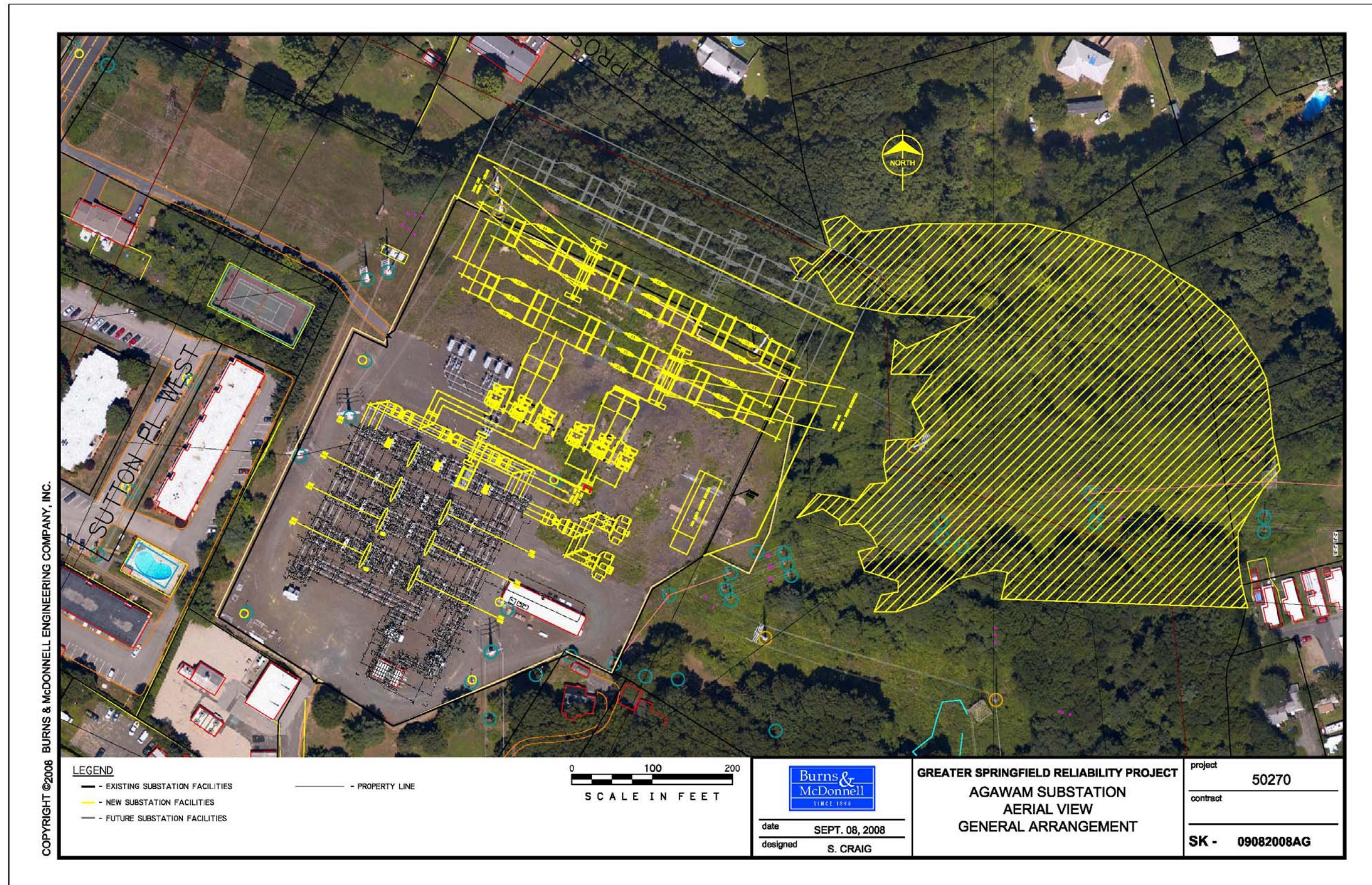
Agawam is an existing substation with a 115-kV switchyard. The proposed modifications at this substation, shown on Figure 2-4 below, include constructing a new 345-kV switchyard to interconnect two 345-kV lines, two 345/115-kV autotransformers, a new 115-kV circuit-breaker bay, and a new control house. 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 fence line) will occur in an area that currently consists of undeveloped areas. There are no watercourses, vernal pools, or Rare Species habitats in the vicinity of the proposed modifications.

Noise studies show little, if any, increase in ambient noise levels due to the modifications at the Agawam Substation.

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Figure 2-4: Agawam Substation



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2.1.4.3 New Fairmont Switching Station

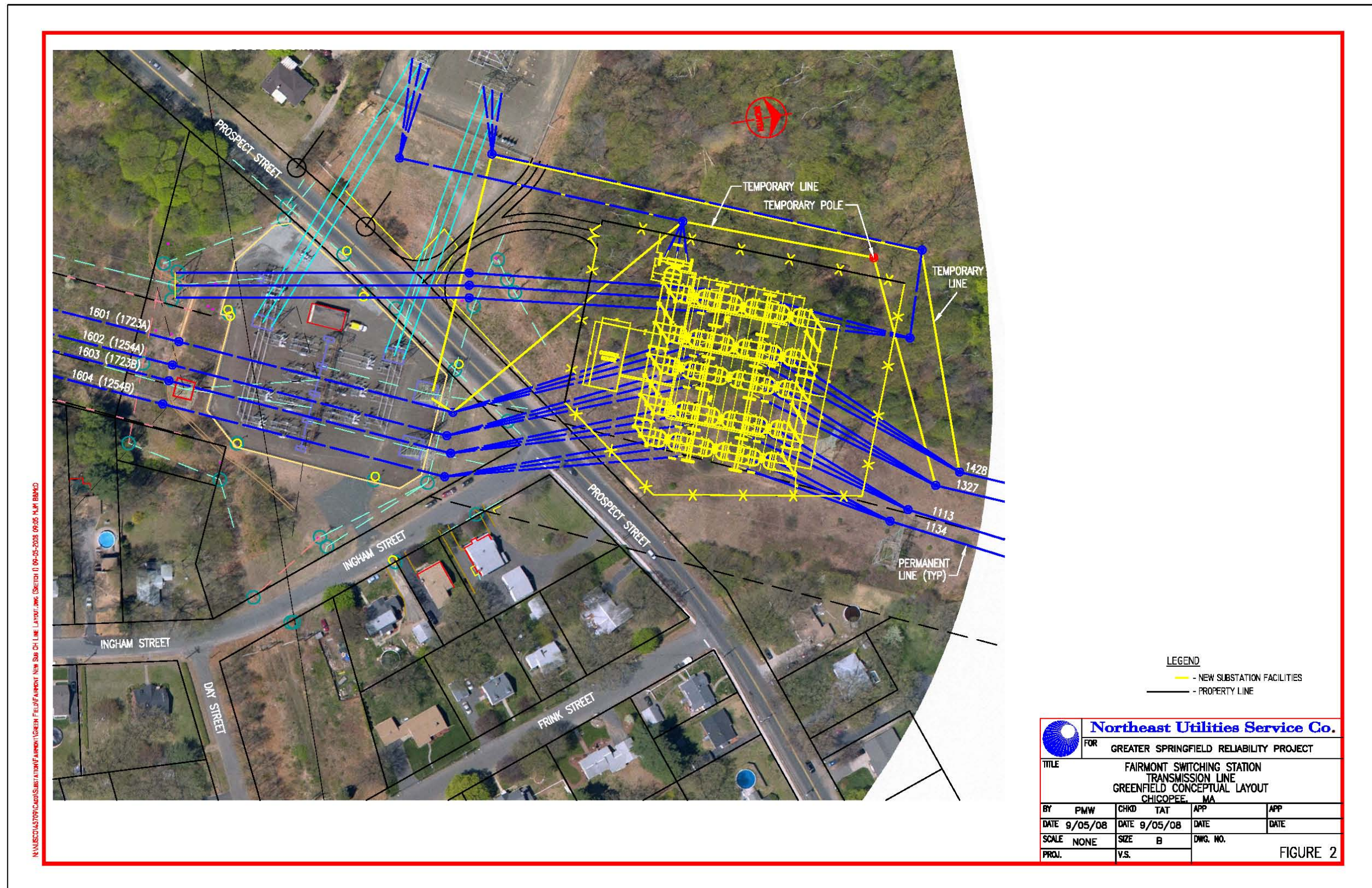
WMECO's existing 115-kV Fairmont Switching Station is located in the northwestern portion of the Town of Chicopee, approximately 0.2 mile southeast of the Connecticut River. The switching station occupies a 3.5-acre site on the corner of Prospect and Ingham streets. The Fairmont Switching Station was built in 1958. As presently configured, the Fairmont Switching Station is not adequate to accommodate the planned electrical system modifications in the Greater Springfield area. Therefore, a new Fairmont Switching Station will need to be constructed, illustrated on Figure 2-5 below. The new switching station will encompass approximately 125,000 square feet, and be comprised of a control house, breaker, bus supports, surge arrestor, and similar equipment.

The 6.6-acre site includes upland, old field/successional habitat. Vegetation is currently maintained to accommodate existing overhead electric transmission lines. The footprint of the site possesses no wetlands, streams, or vernal pools, and is not mapped as Priority or Estimated Habitat for new Rare Species. While it is within proximity of the Connecticut River, it is well beyond the 200-foot Riverfront Area. Based on the University of Massachusetts' (UMASS) initial cultural resources evaluation, the site has only moderate potential sensitivity for Native American artifacts.

Approximately 15,000 square feet of upland forest (primarily oaks) will be cleared along the western edge of the proposed switching station site. Soil disturbance will occur through much of the 6.6-acre site in order to accommodate the new infrastructure, and there will be a net increase of impervious area of roughly 9,400 square feet.

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Figure 2-5: Fairmont Switching Station Potential Site



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2.1.4.4 New Cadwell Switching Station

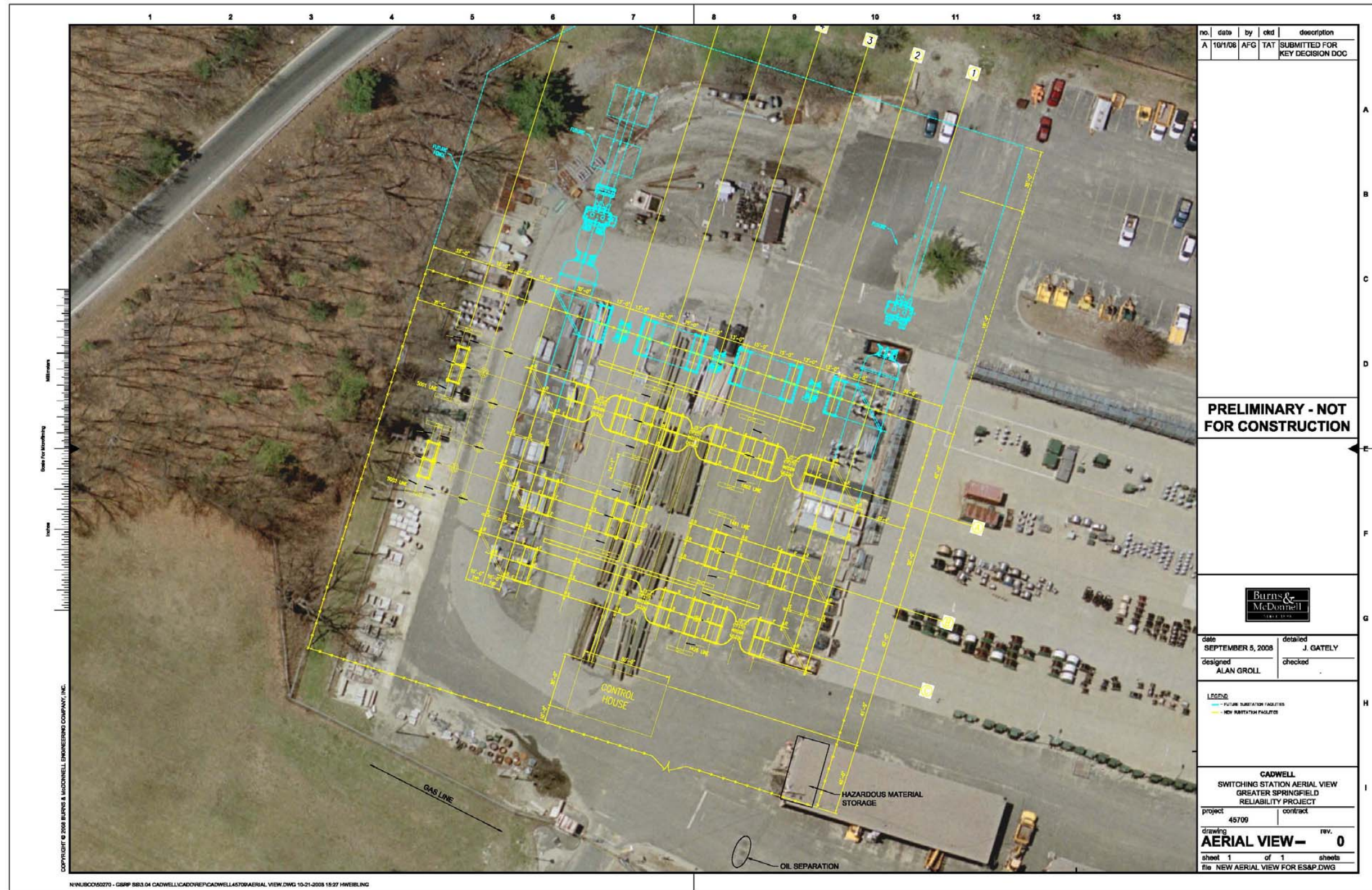
The 4-acre site proposed for the Cadwell switching station is located at the south end of the WMECO property, and presently consists of paved parking and a concrete slab partially covered by an overhead steel roof (used to store vehicles, equipment and materials). To accommodate the switching station, these existing uses will be relocated on the Work Center property. The land uses adjacent to the proposed switching station site consist of commercial and light industrial land uses, including WMECO's transmission ROW from East Springfield Substation.

There are no wetlands, watercourses, vernal pools, or Rare Species habitats within the footprint of the proposed switching station, and the site has low potential sensitivity for Native American artifacts.

Approximately 5,000 square feet of upland forest will be cleared due southwest of the existing paved parking area in order to accommodate two new transmission poles and their respective anchoring systems. Soil disturbance – mostly temporary – will occur as a result of the foundations that will need to be excavated for the new poles. There will be no net increase in impervious area resulting from this element of the Project. An aerial diagram of the new Cadwell Switching Station is set forth in Figure 2-6.

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Figure 2-6: Cadwell Switching Station



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2.1.4.5 Modifications to South Agawam Switching Station

South Agawam is an existing switching station that was built to interconnect the Berkshire Power Plant and which has a 115-kV switchyard. The Project's modifications at this switching station include disconnection of one of the circuits to North Bloomfield and upgrading of the line terminal of the remaining circuit to North Bloomfield, which will become the new South Agawam Switching Station to Southwick Substation circuit. Additional work includes disconnection and removal of circuit switchers and series reactors for both 115-kV circuits. The work will take place within the switching station property with no fence relocation. As the proposed upgrades will be completed within the existing fence line, there will be no significant adverse impacts to the existing environment.

2.1.4.6 Modifications to Orchard Substation

Orchard Substation is an existing substation and the proposed work scope at the Orchard Substation is to upgrade the line terminal equipment to handle increased loads and current requirements. Modifications to existing structures might be necessary to install the new equipment. Conduits and trenching may also be necessary. The upgrades will take place within the properties with no fence relocations. Therefore, significant adverse effects to the existing environment are not anticipated.

2.1.4.7 Modifications to Piper Substation

The proposed work at the existing Piper Substation, will upgrade the line terminal equipment to handle increased line loads and current requirements. Modifications to existing structures might be necessary to install the new equipment. Conduits and trenching may also be necessary. The construction of the above upgrades will take place within the properties with no fence relocations. As such, significant adverse effects to the existing environment are not anticipated.

2.1.4.8 Modifications to Shawinigan Switching Station

Shawinigan is an existing 115-kV switching station built to interconnect three MASSPOWER generators located in Chicopee. The work at the Shawinigan Switching Station will replace existing circuit breakers and upgrade line terminal equipment to handle increased line loads and current requirements. Modifications to existing structures might be necessary to install the new equipment. Conduits and trenching may also be necessary. The construction of the above upgrades will take place within the properties with minimal or no fence relocations. Therefore, significant adverse impacts to the existing environment are not anticipated.

2.1.4.9 Modifications to Chicopee Substation

Chicopee is an existing substation with a 115-kV switchyard. The proposed work scope at the Chicopee Substation is to upgrade the line terminations to handle new additional loads and current requirements. This would be accomplished by replacing motor operated disconnect switches, Wave Traps and associated bus, surge arresters and protection & control systems. Modifications to existing structures might be necessary to install the new equipment. Conduits and trenching may also be necessary. The construction of the above work will take place within the substation property with no fence relocation. Based on the fact that the proposed upgrades will be completed within the existing fenceline, there will be no additional effects to the environment.

2.1.4.10 Modifications to Breckwood Substation

Breckwood is an existing substation with a 115-kV switchyard where underground cables from East Springfield and West Springfield terminate. The work scope at this substation includes the installation of a bypass switch (circuit switcher) to normally bypass the series reactor on circuit 1322. Circuit breaker 1T will normally be open. However, during emergency operating periods when circuit breaker 1T is closed, thus closing the path from East Springfield to Breckwood to West Springfield, the bypass switch shall be open and the reactor will be operated in series with circuit 1322. Provisions should be made to upgrade the protection and communication systems for circuit 1322 to allow the switching in and out of the series reactor. A load transfer scheme will be installed to be used when either cable circuit 1322 or 1433 experiences an outage. The construction of the above work will take place within the substation property with no fence relocation. Based on the fact that the proposed upgrades will be completed within the existing fenceline, there will be no additional effects to the environment.

2.2 CONSTRUCTION METHODOLOGY

The 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 land requirements for the development of the Project and the typical procedures that will be used to construct the Project facilities. 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.