

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF THE FERC STAFF'S ENVIRONMENTAL ANALYSIS

We have determined that construction and operation of the E2W Project would result in limited adverse environmental impacts. These limited impacts would mostly occur during the period of construction. This determination is based on a review of the information provided by Algonquin and further developed from data requests; field investigations; scoping; literature research; alternatives analysis; and contacts with federal, state, and local agencies, Native American tribes, and individual members of the public. We have concluded that if the Project is constructed and operated in accordance with applicable laws and regulations, Algonquin's proposed mitigation, and our additional mitigation measures, it would be an environmentally acceptable action. The environmental effects of constructing and operating the proposed Project and Algonquin's proposed and our additional mitigation measures are summarized below. We are recommending that these mitigation measures be attached as conditions to any authorization issued by the Commission. These mitigation measures are presented in section 5.2.

5.1.1 Geology

Construction and operation of the proposed pipeline and aboveground facilities would not materially alter the geologic conditions of the Project area. However, over most of the Project area, natural topographic slopes and contours would be temporarily altered by the small-scale grading of the construction right-of-way that is necessary to provide a level and safe work surface for equipment and by trenching activities. After completion of construction, Algonquin would restore topographic contours and drainage conditions as closely as feasible to their preconstruction condition. Because the majority of the pipeline routes would be located within or adjacent to existing rights-of-way, construction and operation of the pipelines would not result in a significant, additional restriction to current or future mining operations in the area. In addition, due to the abundance of sand and gravel deposits in the area, construction and operation of the pipelines would not have a significant effect on the availability of sand and gravel in the region. Seismic hazards, landslides, flash flooding, and subsidence are unlikely to impact the Project facilities.

Blasting would be necessary in areas of shallow bedrock that could not be excavated by conventional methods. Based on field surveys and soils data, blasting may be needed along approximately 7.1 miles of the pipeline routes. All blasting activities would be conducted in strict compliance with Algonquin's Blasting Plan and in accordance with federal, state, and local regulations governing the safe storage, handling, firing, and disposal of explosive materials. Algonquin would conduct preblasting inspections to assess and document the condition of all structures, wells, springs, and utilities within 150 feet of the construction work area. Following the completion of blasting operations, an independent contractor would examine the condition of all structures within 150 feet. If any blasting-related damages are identified, Algonquin would either provide compensation to the affected landowner or arrange for the necessary repairs. We reviewed Algonquin's Blasting Plan and find it acceptable.

NSTAR expressed concerns that blasting in conjunction with the proposed Project could compromise the foundations of its existing electric transmission line towers in those areas where the proposed I-10 Extension would be collocated with NSTAR's existing right-of-way. Any blasting that may be necessary in NSTAR's right-of-way would be coordinated with NSTAR representatives and conducted in accordance with Algonquin's Blasting Plan that requires, among other things, that blasting be conducted by a certified blast engineer. Algonquin has also committed to developing site-specific blasting plans for those locations where blasting would occur near existing electric transmission towers and would provide these plans to NSTAR for review (see section 5.1.12).

5.1.2 Soils

Construction of the pipelines and aboveground facilities could expose soils to erosional forces, compact soils, affect soil fertility, bring rock to the surface, and facilitate the dispersal and establishment of weeds. Algonquin proposes to mitigate these potential impacts by implementing measures included in its Project-specific E&SCP Plan. Algonquin's E&SCP includes measures to control erosion and sedimentation during construction and to ensure proper revegetation. Some of the relevant mitigation measures specified in the E&SCP include topsoil segregation, temporary and permanent erosion control, removal of excess rock, and post-construction restoration and revegetation of construction work areas. Algonquin's proposed measures to minimize impacts on soils are appropriate and consistent with our Plan and Procedures with the exception that Algonquin does not propose to conduct compaction testing and mitigation in residential areas. Because compaction of subsoil layers could create drainage problems in the soils and restrict the root growth of various types of plants, including grasses under certain conditions, we are recommending that Algonquin revise its E&SCP to include soil compaction testing and mitigation measures consistent with sections V.C.1 and V.C.3 of the FERC Plan. Algonquin's Invasive Species Control Plan is discussed in sections 5.1.4 and 5.1.5.

We would monitor the right-of-way during both the construction and restoration phases. In addition, Algonquin would conduct post-construction monitoring of mitigation practices to ensure their successful implementation. Revegetated areas would be monitored following construction for the first and second (as necessary) growing season in upland areas; wetlands would be monitored for at least 3 years to ensure successful restoration. Algonquin would prepare activity reports during this period documenting any problems identified and describing corrective actions taken to remedy these problems. These reports would be submitted to the FERC on a quarterly basis. If, after 2 years, it is determined that the areas crossed by the pipelines have not been restored successfully, Algonquin would implement additional restoration measures.

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of contamination are typically minor because of the low frequency and volumes of spills and leaks. Algonquin's SPCC Plan identifies preventive measures to reduce the likelihood of a spill and specifies measures to contain and clean up a spill should one occur. Implementation of Algonquin's SPCC Plan would effectively reduce the potential impact on soils from spills of the hazardous materials used during construction. Additional discussion of the SPCC Plan is included in section 5.1.3.

Previously existing contaminated soils could be encountered at historic landfills and other hazardous waste sites during Project construction. Additional discussion of hazardous waste sites that would be crossed by the pipeline routes and the measures Algonquin would implement to minimize potential impacts in the event contaminated soils are encountered is included in section 5.1.8.

5.1.3 Water Resources

Groundwater

For the majority of the Project, groundwater levels are generally well below the land surface that would be affected by construction activities. The Project would cross one sole source aquifer and two WPAs in Massachusetts; no sole source aquifers or APAs would be crossed in Connecticut. MassDEP-designated PPAs would be crossed 11 times, all within the Boston Harbor major surface water basin. Two CTDEP-designated GGA areas would be crossed by the E-3 System Replacement. Fourteen private water supply wells have been identified within 150 feet of the construction work area. Of these, six are along the I-10 Extension and eight are along the E-3 System Replacement. No private water supply wells

have been identified within 150 feet of the construction work area for the Q-1 System Replacement or the Rehoboth Compressor Station, and no public water supply wells or springs have been identified within the construction work area for any of the Project facilities. Algonquin is continuing to conduct field surveys to verify the location of water supply wells and springs and would file information on the locations when surveys are complete.

Algonquin would conduct pre- and post-construction testing of all existing private water supply wells within 150 feet of the construction work area. If blasting is required near water supply wells, blasting loads would be reduced as much as possible. If blasting or construction activities temporarily impair the quality or yield of a water supply well, Algonquin would either provide a temporary source of water (e.g., bottled) to residents until the damaged water well is restored to its former capacity and quality or compensate the landowner for the damages. If the water is used for farming or livestock operations, temporary water would be trucked from a municipal water source until the water supply well is repaired or replaced. In the unlikely event that water quality or yield is permanently impaired as a result of blasting or other construction activities, Algonquin would arrange for the water supply well to be repaired or replaced. As discussed above, Algonquin is continuing to conduct field surveys to verify the location of water supply wells and springs and would file information on the locations when surveys are complete. To ensure final well and spring locations are identified prior to construction and that proposed mitigation measures are appropriate, we are recommending that Algonquin file the field verified locations, by milepost, of all water supply wells and springs within 150 feet of construction work areas. We are also recommending that Algonquin file a report discussing whether any complaints were received concerning well yield or water quality and how each was resolved within 30 days of placing the facilities in service.

Accidental spills and leaks of hazardous materials associated with equipment; the refueling or maintenance of vehicles; and the storage of fuel, oil, and other fluids pose the greatest risk to groundwater resources. If not cleaned up, contaminated soils could continue to leach and add pollutants to groundwater long after a spill has occurred. Implementation of the measures in Algonquin's SPCC Plan would minimize the potential for groundwater impacts associated with an inadvertent spill of hazardous materials or petroleum. The SPCC Plan identifies preventive measures to reduce the likelihood of a spill such as secondary containment for petroleum products, daily equipment inspection for leaks, and restrictions on the transport of potentially hazardous materials to the construction work area. The SPCC Plan also specifies measures to contain and clean up a spill should one occur. The SPCC Plan does not, however, specify restrictions on refueling near private or public water supply wells. Therefore, we are recommending that Algonquin revise its SPCC Plan to prohibit refueling within 200 feet of any private water supply well and 400 feet of any public water supply well.

Contaminated groundwater could be encountered at historic landfills and other hazardous waste sites during Project construction. Additional discussion of hazardous waste sites that would be crossed by the pipeline routes and the measures Algonquin would implement to minimize potential impacts in the event contaminated groundwater is encountered is included in section 5.1.8.

Surface Waters

A total of 39 waterbodies, including 22 perennial waterbodies and 17 intermittent streams or ditches would be crossed by the pipelines associated with the E2W Project. Of these waterbodies, 14 perennial and 2 intermittent waterbodies are designated coldwater or warmwater fishery resources. Two of these waterbodies, the Weymouth Fore and Shetucket Rivers, are major waterbodies (greater than 100 feet wide). The Weymouth Fore River is considered sensitive because it is listed as impaired for pathogens and supports EFH for winter flounder. The Shetucket River is considered sensitive because it is part of a protected National Heritage Corridor and supports EFH for Atlantic salmon. EFH is discussed in section 5.1.6.

The waterbody crossings would be constructed in accordance with federal, state, and local permits and in accordance with Algonquin's E&SCP, which is based on the FERC's Plan and Procedures. Algonquin has identified specific construction methods it would use at each waterbody, including the dry and wet open-cut, flume, dam and pump, HDD, and bore construction methods.

Algonquin is proposing to cross the Weymouth Fore and Shetucket Rivers using the HDD method. The second crossing of Hunter Brook would be included as part of the HDD of the Shetucket River. Impacts on these waterbodies would be minimized through the successful use of the HDD crossing method. The primary impact that could occur as a result of an HDD crossing is an inadvertent release of drilling mud (also referred to as a frac-out) directly or indirectly into the waterbody. Algonquin has developed an HDD Contingency Plan that describes how the HDD operations would be conducted and monitored to minimize the potential for frac-outs as well as general procedures for cleanup of drilling mud releases and the procedures that would be followed if it is necessary to abandon the drill hole.

Algonquin has submitted preliminary site-specific HDD crossing plans for the Weymouth Fore and Shetucket Rivers. We have reviewed these plans and generally find them adequate. However, we have determined that the HDD entry and exit point staging areas and other temporary extra workspaces depicted on the site-specific crossing plans differ from those depicted on the filed alignment sheets. To clarify the HDD workspace requirements, we are recommending that Algonquin prepare and file final site-specific HDD crossing plans and alignment sheets that depict consistent construction work areas for the HDDs of the Weymouth Fore and Shetucket Rivers.

Although Algonquin's HDD Contingency Plan specifies how drilling mud would be disposed, it does not specify the sources of water that would be used for mixing the drilling mud. To ensure all Project-related surface water withdrawals are identified in consideration of potential impacts on aquatic resources and water quality, we are recommending that Algonquin revise its HDD Contingency Plan to specify the sources of water that would be used for the drilling mud at each proposed HDD crossing.

The Weymouth Fore and Shetucket Rivers are navigable waters regulated by the COE under section 10 of the Rivers and Harbors Act and section 404 of the CWA. Section 10 of the Rivers and Harbors Act prohibits the creation of any obstruction to the navigable capacity of any waters of the United States without specific approval of the COE. If the HDD crossings are successful, the Project would not create an obstruction to the navigable capacity of these waterbodies.

Based on the subsurface conditions identified during Algonquin's geotechnical investigations, it appears that the HDDs are feasible; however, should one or both of the HDDs fail, Algonquin would meet with the appropriate permitting agencies to discuss the potential need to initiate the permitting process for an alternative crossing method of the river(s). In the event of an unsuccessful HDD requiring an alternative crossing method, we are recommending that Algonquin file a site-specific crossing plan with the Secretary concurrent with the submission of its application to the COE for a permit to construct using this plan.

In addition to the Weymouth Fore and Shetucket Rivers, 14 other waterbodies that would be crossed by the E2W Project are considered sensitive for various reasons, including being listed on the Massachusetts 303(d) list as impaired, designated as an ORW, or containing a fishery of special concern. These waterbodies would be crossed using a dry crossing technique or crossed by the wet open-cut crossing method in accordance with the mitigation measures in Algonquin's E&SCP.

Groundwater and Surface Water Uses During Construction

Algonquin is proposing to primarily use surface water sources to hydrostatically test the pipeline facilities. If a sufficient amount of water cannot be withdrawn from one of the potential surface water sources identified, Algonquin proposes to use a clean municipal water source(s) obtained from municipal supplies, local vendors, or other approved sources/locations. Algonquin also proposes to use clean municipal water to hydrostatically test the proposed Rehoboth Compressor Station. Because groundwater supply wells contribute to the public water supply (i.e., municipal water) in some municipalities along and adjacent to the proposed Project facilities, groundwater could be indirectly used during hydrostatic testing of the pipeline facilities. The withdrawal of large volumes of water from surface water sources could temporarily affect the recreational and biological uses of the resource if the diversions constitute a large percentage of the source's total flow or volume.

Algonquin would minimize the potential for these effects by adhering to the hydrostatic testing measures included in its E&SCP. The rate of water withdrawal from private or municipal sources would be limited so as not to exceed the delivery capacity of the system or well. Algonquin would be testing only new pipe and no chemicals would be added to the test water.

The potential impacts resulting from the discharge of hydrostatic test water include soil erosion and stream scour and subsequent degradation of water quality. Algonquin would minimize the potential for these impacts by discharging the test water in accordance with the requirements of the applicable Massachusetts and Connecticut NPDES permits. The discharge rate would be regulated, and water would be discharged through an energy dissipation device and sediment barriers, as necessary, to prevent erosion or excessive flow. Samples of the hydrostatic test water would be collected and tested in accordance with federal and state permit requirements.

Water would also be needed to control fugitive dust during construction. Algonquin has not prepared a Dust Control Plan or specified the sources of water that would be used for dust control. The impacts on water resources due to water withdrawals for dust control would be the same as those for hydrostatic test water withdrawals. We are recommending that Algonquin prepare and file a Dust Control Plan that specifies the sources of water that would be used for dust control, the anticipated quantities of water that would be required, and measures to minimize fish and fish egg entrainment during dust control water withdrawals.

5.1.4 Wetlands

Based on Algonquin's wetland delineations, 137 wetlands would be crossed by the Project for a total crossing length of 43,277 feet. These include 63 wetlands along the I-10 Extension, 31 wetlands along the Q-1 System Replacement, and 43 wetlands along the E-3 System Replacement. A total of 9.2 acres of permanent wetland impacts would occur within the maintained portion of the permanent right-of-way, which includes 4.4 acres of forested wetland impacts and 4.8 acres of non-forested wetland impacts. An additional 0.1 acre of forested wetland impact would occur from the construction of a permanent access road at the beginning of the Q-1 System Replacement. To reduce the impacts of construction on wetland resources, Algonquin would implement its E&SCP that incorporates the mitigation measures outlined in the FERC Plan and Procedures, with one exception. Algonquin has proposed to use an 85-foot-wide construction right-of-way in all wetlands crossed in Massachusetts, in order to maintain minimum safety requirements and accommodate the large amount of unconsolidated soils that would be excavated for a 36-inch-diameter pipeline. Our Procedures require reducing the width of the construction right-of-way to 75 feet through wetland areas. While we recognize that additional right-of-way width may be appropriate and required at certain locations, we do not believe Algonquin has adequately justified widening the right-of-way in all wetlands in Massachusetts. Consequently, we are

recommending that Algonquin revise its alignment sheets and E&SCP to restrict the right-of-way width through wetlands to 75 feet, or file site-specific justification for each wetland that would require a greater than 75-foot-wide right-of-way.

Algonquin would also implement measures outlined in its Project-specific Wetland Restoration Procedures for Temporary Wetland Impacts, which documents specific practices that would be implemented to minimize potential adverse effects on wetlands during construction. Relevant measures specified in these procedures include, but are not limited to, clearly marking all wetland areas until construction-related ground-disturbing activities are complete; installing sediment barriers to prevent the flow of sediment into wetlands; segregating and stockpiling the top 1 foot of topsoil to expedite restoration of wetland resources; limiting construction equipment operating in wetlands to only that needed to install and restore the wetland; and using low-ground-weight construction equipment or operating equipment from timber riprap, prefabricated equipment mats, or terra mats to minimize disturbance and compaction in wetlands.

Algonquin would conduct post-construction monitoring of all wetlands affected by construction annually for 3 years to assess the condition of revegetation and the success of restoration. Algonquin would consult with the COE and other applicable federal and state agencies to develop appropriate remedial actions if a wetland area does not show signs of re-establishment of native wetland vegetation or if there is a need for invasive plant species control measures. Algonquin would prepare monitoring reports to document any problems identified and would describe corrective actions taken to remedy these problems. These reports would be submitted to the FERC on a quarterly basis.

Algonquin has consulted with the New England District of the COE to discuss compensatory mitigation for the permanent loss of forested wetland. Algonquin anticipates that the preferred mitigation would include “preservation” at a 1:15 compensation ratio, which would equate to preservation of approximately a 67.5-acre site. Algonquin has identified several potential sites within Massachusetts that may be suitable for the entire Project pending concurrence from Connecticut resource agencies, the EPA, and the FWS. Algonquin’s preferred site at this time is a 96-acre property (referred to as the Gibson Property or Glen Echo Property) that would be crossed by the I-10 Extension between MPs 11.3 and 11.9. Under the terms of an agreement Algonquin has entered into with the Town of Stoughton, and assuming Algonquin’s proposed route is approved by the FERC, Algonquin has agreed to acquire and transfer the entire 96 acres of the site to the town. Algonquin’s intent and primary interest in the property is for wetland mitigation; therefore, a large portion of the property (46.2 acres) would be restricted by a conservation easement pursuant to Algonquin’s COE permit and wetland mitigation requirements. Of this, 19.2 acres would compensate for wetland impacts and an additional 23.7 acres of upland forest would be protected by the conservation easement. The remaining portion of the property would be conveyed to Stoughton and would be encumbered only by the town’s enforceable conservation and/or open space and passive recreational limitations. The portion of the Property that would be conveyed to Stoughton includes 6.0 acres of wetlands.

Because the Gibson Property would not provide for the preservation of the required 67.5 acres of wetlands, Algonquin is considering at least two other potential compensation sites and has initiated contacts with the respective landowners. To ensure that Algonquin develops a mitigation plan that appropriately compensates for Project-related wetland impacts, we are recommending that Algonquin file a description of any additional sites under consideration to fulfill the 1:15 wetland preservation ratio required by the COE, the acreage of wetlands that would be preserved on each site, the details of any conservation restrictions that would be placed on each site, and the comments of the COE on the compensatory wetland mitigation plan.

The COE has indicated that any conservation restrictions associated with Algonquin's compensatory wetland mitigation plan would need to be approved and in effect before the COE would issue its section 404 permit.

Algonquin has prepared an Invasive Species Control Plan to control the spread of two foreign and invasive wetland plant species, purple loosestrife and common reed. Algonquin would conduct post-construction monitoring for invasive plant species that includes monitoring for the first 3 to 5 years following restoration of the right-of-way. If invasive species have spread into new areas, Algonquin would implement removal and eradication measures as specified in its Invasive Species Control Plan.

In addition to implementing the plans described above, Algonquin would comply with the COE's section 404 and the MassDEP's and CTDEP's section 401 permit conditions.

5.1.5 Vegetation

Construction would result in temporary and permanent impacts on vegetative cover types. The primary impact of the Project on vegetation would be the cutting, clearing, and/or removal of existing vegetation within the construction work area. Secondary effects associated with disturbances to vegetation could include increased soil erosion, increased potential for the introduction and establishment of invasive weedy species, and a local reduction in available wildlife habitat. Other potential effects on vegetation could include the contamination of soils from spills or leaks of fuels, lubricants, and coolants from construction equipment that would restrict the ability of vegetation to become re-established.

In general, to reduce impacts on vegetation communities, Algonquin would use existing rights-of-way to reduce the amount of disturbance during construction. Approximately 60 percent of the I-10 Extension would be within or adjacent to NSTAR's powerline right-of-way. The large percentage of the pipeline segments along the Q-1 and E-3 System Replacements that would be installed using the lift and replace method would involve removing the existing pipeline and installing the replacement pipe in approximately the same location as the old pipe. Overall, about 51 percent of the vegetation disturbed by the pipeline facilities would be within Algonquin's and/or NSTAR's existing, previously disturbed rights-of-way. By locating the pipelines in these areas, Algonquin would reduce the area of new disturbance and, therefore, reduce impacts on vegetation. The remaining 49 percent of vegetation disturbance would be outside the Algonquin or NSTAR existing rights-of-way. Algonquin would implement measures in its E&SCP to minimize impacts on vegetative resources and to allow for restoration of vegetative communities.

The greatest impact would be on forested areas because of the time required to restore the woody vegetation to its preconstruction condition. Construction in forest lands would remove the large, mature tree canopy over the width of the construction right-of-way, which would change the structure and environment of the forest area. Permanent impacts would be greatest on the maintained portion of the permanent right-of-way where ongoing vegetation maintenance during operations would preclude the re-establishment of trees. Construction of the pipelines would affect approximately 109.1 acres of upland forest.

This loss of upland forest would be partially mitigated by Algonquin's acquisition of its preferred site for compensatory wetland mitigation. As discussed in section 5.1.4, Algonquin's preferred site for compensatory wetland mitigation is a 96-acre property of which a large portion would be protected by a conservation easement. Although Algonquin's primary intent in acquiring the site is for compensatory wetland mitigation, 23.7 acres of upland forest would be protected by the conservation easement. In addition to the compensatory wetland mitigation site, Algonquin proposes to acquire a 97-acre parcel of land for the Rehoboth Compressor Station. Most of this 97-acre area is covered by forest. Construction

of the Rehoboth Compressor Station and associated facilities would disturb about 18.1 acres of upland forest within the center of the site. The remainder of the forest land would be preserved as screening and buffering for the compressor station or potentially used as conservation or mitigation areas.

Construction activities within the Cranberry Brook Watershed ACEC would affect about 8.0 acres of wetland and upland forest communities and about 8.5 acres of early successional-upland scrub-shrub vegetation. Algonquin would implement measures in its E&SCP to reduce impacts on vegetation within the construction and permanent rights-of-way to improve revegetation potential. Algonquin is currently conducting research to identify an appropriate and available seed mix that could be used in this ACEC to promote revegetation of the right-of-way with native herbaceous species while also quickly stabilizing the soil and providing erosion and sedimentation control. To ensure selection of a seed mix that is consistent with agency recommendations, we are recommending that Algonquin file a description of the native seed mix that would be used in the Cranberry Brook Watershed ACEC along with the comments of the MassNHESP and the MassDCR on the selected seed mix.

Following construction, Algonquin would seed all previously vegetated portions of the construction work area following the measures outlined in the E&SCP. Additionally, in accordance with its E&SCP, Algonquin would monitor all disturbed areas to determine the post-construction revegetative success for two growing seasons following construction. Revegetation monitoring would also assess the establishment of undesirable invasive plant species as discussed in section 5.1.4. Measures that would be implemented to minimize the impact of invasive species on revegetation of disturbed areas and to remove or eradicate invasive species that have spread into new areas are included in Algonquin's Invasive Species Control Plan.

Following restoration, Algonquin would retain a 50-foot-wide permanent right-of-way along the I-10 Extension and Q-1 System Replacement and a 30-foot-wide permanent right-of-way for the E-3 System Replacement. Routine maintenance of the right-of-way would be required to allow access for routine pipeline patrols and visibility during aerial patrols as well as to maintain access in the event emergency repairs are needed. In accordance with its E&SCP, Algonquin would not conduct vegetation maintenance across the full width of the permanent right-of-way, but instead would limit maintenance to optional mowing of a 10-foot-wide strip centered over the pipeline and cutting trees and shrubs greater than 15 feet in height that are within 15 feet of the pipeline centerline. Vegetation maintenance on the construction right-of-way adjacent to waterbodies would consist of maintaining a riparian strip within 25 feet of a waterbody. However, a corridor centered over the pipeline up to 10 feet wide would be permanently maintained in an herbaceous state, and trees and shrubs greater than 15 feet in height may be selectively cut within 15 feet on either side of the pipeline. Algonquin would not apply herbicides for general right-of-way maintenance.

5.1.6 Wildlife and Aquatic Resources

The impact of the Project on wildlife species and their habitats would vary depending on the requirements of each particular species and the existing habitat present in the areas affected by the Project. In total, the pipeline facilities would affect about 109.1 acres of upland forest, 168.3 acres of early successional upland scrub-shrub wildlife habitat, 25.7 acres of forested wetland habitat, and about 34.1 acres of non-forested wetland habitat. Direct impacts of construction on wildlife would include the displacement of wildlife on the right-of-way and the potential mortality of some individuals. During construction, Algonquin would reduce the loss of wildlife habitat through implementation of its E&SCP. To minimize impacts on wetland habitats, we are recommending that Algonquin reduce the width of the right-of-way to 75 feet through wetlands or provide site-specific justification for each wetland that would require a greater than 75-foot-wide right-of-way (see section 5.1.4). As also discussed in section 5.1.4, Algonquin would compensate for the permanent loss of forested wetlands as required by the COE and we

are recommending that Algonquin file additional information regarding its compensatory wetland mitigation plan along with the COE's comments on the plan. Disturbance to open water wildlife habitats would not have lasting effects following construction of a waterbody crossing, which in most cases would be completed within 24 to 48 hours. Algonquin would follow the measures outlined in its E&SCP to reduce impacts on open water habitats. Secondary effects of construction could include lower reproductive success by disrupting courting, nesting, or breeding of some species, which could also result in a decrease in the food stock available for predators of these species. These effects, however, would cease after construction, and wildlife would return to the newly disturbed areas and adjacent, undisturbed habitats after right-of-way restoration is complete. Indirect wildlife impacts associated with construction noise and increased activity would be temporary and may include abandoned reproductive efforts, displacement, and avoidance of work areas.

The cutting, clearing, and/or removal of existing vegetation within the construction work area would also affect wildlife by reducing the amount of available habitat for nesting, cover, and foraging. The degree of impact would depend on the type of habitat affected and the rate at which vegetation regenerates after construction. Algonquin's proposed conservation measures to minimize or avoid impacts on special status species, as well as any additional measures that the MassNHESP would require, would serve to avoid, minimize, or compensate for impacts on wildlife and wildlife habitat (see section 5.1.7).

The clearing of vegetation during the nesting season could have direct impacts on individual migratory birds that would be similar to the impacts described for other wildlife species. Algonquin plans to commence construction in June 2009. Although this schedule would avoid a portion of the migratory bird nesting season (April to June), it would correspond with the remaining portion of the nesting season. The majority of the nesting migratory bird species, however, would have had an opportunity to complete their first nesting attempt before the commencement of construction. Additionally, because the majority of the proposed pipelines would be located within or adjacent to Algonquin's and/or NSTAR's existing rights-of-way, impacts on forest-dwelling migratory birds would not be significant. The Project would result in a temporary loss of habitat available to migratory birds, but this effect would be mitigated by Algonquin's proposal to restore disturbed areas following construction to make them available for use by migratory birds during the next nesting season following construction.

Upon completion of construction, Algonquin would revegetate the right-of-way and would monitor revegetation in all areas to determine post-construction revegetative success for 3 years as specified in its E&SCP. Algonquin would also implement measures outlined in its Invasive Species Control Plan to prevent the introduction and proliferation of invasive plant species in wetland habitats. Algonquin's vegetation maintenance practices are discussed in section 5.1.5. All maintenance clearing activities would be conducted outside of the April 15 to August 1 time window for migratory bird species to avoid impacts on ground nesting migratory birds.

Vernal pools are ephemeral wetlands that fill annually from precipitation, runoff, and rising of the water table. These pools are sensitive wildlife habitats. Algonquin's surveys identified a total of 18 (17 potential and 1 certified) vernal pools within 150 feet of the construction work area in Massachusetts. Although Algonquin has adopted several route variations to avoid or minimize impacts on vernal pools, at least a portion of four of the vernal pools, including one high quality vernal pool, would be crossed and directly impacted. In Connecticut, nine vernal pools were identified within 150 feet of the construction work area. Of the nine vernal pools in Connecticut, at least a portion of six vernal pools, including three high or very high quality vernal pools, would be crossed and directly impacted. Based on our review of Algonquin's filed alignment sheets, we believe that Algonquin could further modify its route to avoid or reduce impacts on vernal pools and are recommending that it provide an assessment of the potential to reduce the construction right-of-way width at several locations along the pipeline routes. Although three

potential vernal pools were identified during the wetland delineation of the Rehoboth Compressor Station site, none are located within the proposed construction work area.

Algonquin would minimize potential impacts on vernal pools by implementing measures outlined in its E&SCP. Algonquin would also implement similar construction, revegetation, and restoration efforts for vernal pools as with other wetlands within the Project area. Algonquin has been consulting with the MassNHESP regarding construction through and near vernal pools and would include final conservation measures in its MESA application that would be submitted to the MassNHESP in late October 2008. Algonquin submitted its section 401 Water Quality Certification applications to the MassDEP and the CTDEP and submitted its application for a section 404/10 Individual Permit to the COE, but has not conducted any further consultation with these agencies regarding vernal pool impacts and mitigation. To ensure that issues related to vernal pools are appropriately addressed by Algonquin during the federal and state review processes, we are recommending that Algonquin continue to consult with the COE, the MassNHESP, the MassDEP, and the CTDEP to determine additional recommended mitigation measures, and file a description of these measures and specifically identify which of these measures it would implement.

Other significant sensitive wildlife habitats that would be affected by the E2W Project include the Cranberry Brook Watershed ACEC that would be crossed by the I-10 Extension, and the Moose Hill Wildlife Sanctuary and Moose Hill Farm that would be crossed by the Q-1 System Replacement. Algonquin would implement its E&SCP and Invasive Species Control Plan to minimize impacts on these sensitive wildlife habitats. Algonquin is continuing its consultations with the MassDCR, ACEC Program; the Massachusetts Audubon Society; and the Trustees of Reservations and would file any additional agency-recommended site-specific measures to minimize impacts on these sensitive wildlife habitats.

Fishery resources in the 39 waterbodies that would be crossed by the proposed Project include freshwater, marine, coldwater, and warmwater fisheries. A total of 23 waterbodies would be crossed by the pipeline routes in Massachusetts and 16 waterbodies would be crossed by the pipeline route in Connecticut. Fishery resources in Massachusetts primarily include warmwater fisheries, but one coldwater fishery and one marine fishery would be crossed. Fishery resources in Connecticut include coldwater, warmwater, and diadromous fisheries, and all of the fisheries that would be affected in Connecticut are freshwater systems. The majority of these waterbodies support warmwater fisheries, but two waterbodies support coldwater fisheries.

In-stream construction across waterbodies could have both direct and indirect effects on aquatic resources. These potential effects include increased sedimentation and turbidity of the water, alteration or removal of aquatic habitat cover, streambank erosion, impingement or entrainment of fish and other biota associated with the use of water pumps, downstream scouring associated with the use of water pumps, and the potential for fuel and chemical spills. Construction-related impacts on aquatic resources could also result from in-stream blasting and water withdrawals for hydrostatic testing and dust control.

Algonquin would minimize the effects of the Project on aquatic resources through the use of various crossing methods, construction timing windows, extra workspace restrictions, restoration procedures, and other mitigation measures. Algonquin would also implement measures outlined in its E&SCP to minimize impacts on aquatic resources such as restoring streambeds and banks to preconstruction conditions. Adherence to the E&SCP would maximize the potential for regrowth of riparian vegetation, thereby minimizing the potential for any long-term impacts associated with lack of shade and cover.

Fisheries of special concern in the vicinity of the proposed Project include the Weymouth Fore River and Traphole Brook in Massachusetts and Norwichtown Brook, Hunter Brook, and the Shetucket

River in Connecticut. The Weymouth Fore and Shetucket Rivers also support designated EFH. NOAA Fisheries has requested that special attention be paid to potential impacts on winter flounder in the Weymouth Fore River and Atlantic salmon in the Shetucket River. Algonquin proposes to cross these five waterbodies containing fisheries of special concern using the HDD or horizontal bore method. These crossing methods would avoid direct impacts on the aquatic resources and EFH within these waterbodies. Algonquin would cross all other coldwater streams using dry crossing techniques that would effectively isolate the area of impact on the construction right-of-way, and thus, substantially avoid many of the impacts associated with open-cut crossings.

As discussed in section 5.1.3, Algonquin proposes to use the HDD method to install the pipeline under the Weymouth Fore River, Shetucket River, and one of the two Hunter Brook crossings. Algonquin has developed an HDD Contingency Plan that describes how the HDD operations would be conducted and monitored to minimize the potential for frac-outs as well as general procedures for cleanup of drilling mud releases and the procedures that would be followed if it is necessary to abandon the drill hole. Use of the HDD method for the crossings of the Weymouth Fore and Shetucket Rivers would minimize impacts on the bed, banks, and EFH associated with these waterbodies. Although there are potential impacts associated with the HDD method, none of these effects are expected to be significant due to the small area that would be affected and the relatively short duration of construction. Additionally, implementation of Algonquin's proposed conservation measures and continued coordination with applicable resource agencies would avoid or minimize impacts on managed fish species and their designated EFH.

Algonquin proposes to conduct a horizontal bore under Norwichtown Brook and use a dry crossing method to cross Traphole Brook and the second crossing of Hunter Brook. The potential impacts from these activities are similar to those discussed above. In accordance with its E&SCP and the construction timing windows prescribed for coldwater fisheries by the MassDFW and the CTIFD, in-stream work in these waterbodies would be conducted between June 1 and September 30. The implementation of Algonquin's E&SCP and the use of the horizontal bore or another dry crossing method would minimize impacts on aquatic resources.

Some in-stream blasting would likely be required. Preparation of the rock for blasting (i.e., drilling shot holes) would cause enough disturbance to displace most aquatic organisms from the immediate vicinity of the blast. The blasting contractor would use delays and measures to dampen the blast. The nature of the material that would require blasting and the short duration of blasting activities would minimize the amount of fine-grained material released to the aquatic habitat. Immediately following blasting, Algonquin would remove rock debris so as not to impede downstream flow. Algonquin has prepared a Blasting Plan to minimize the effects of blasting within waterbodies and to ensure safety during blasting operations.

In accordance with its E&SCP, Algonquin would minimize the potential for impacts associated with hydrostatic testing by fitting withdrawal intake hoses with screening devices that would minimize the entrainment of fish and fish eggs. Algonquin would also obtain approval for hydrostatic test water withdrawal and discharge locations and would comply with regulatory permit conditions regarding discharges to prevent scour and sedimentation, flooding, or the introduction of foreign or toxic substances into the aquatic system.

To minimize the potential for spills from equipment use to impact aquatic resources, Algonquin would implement measures contained in its SPCC Plan. The SPCC Plan states that refueling or other handling of hazardous materials within 100 feet of a waterbody would not be allowed and that Algonquin would conduct routine inspections of tank and storage areas to reduce the potential for spills or leaks of hazardous materials.

5.1.7 Special Status Species

To comply with section 7 of the ESA, we have informally consulted with the FWS and NOAA Fisheries regarding the presence of federally listed or proposed species in the Project area. Based on these consultations, it has been determined that no federally listed species potentially occur in the general vicinity of the proposed E2W Project and, therefore, the E2W Project would have no effect on federally listed species or their critical habitats. Required consultations under section 7 of the ESA are complete unless new species are listed or new information becomes available indicating a potential Project effect on listed species or critical habitat that was not considered in this EIS.

Consultation with the MassNHESP identified two significant wildlife habitat types including Estimated Habitats of rare wetlands wildlife and Priority Habitats of rare species and exemplary communities. Consultation with the MassNHESP and the Massachusetts Audubon Society identified one state-endangered species (dwarf rattlesnake plantain) and six Massachusetts special concern species (blue-spotted salamander, eastern box turtle, mocha emerald dragonfly, eastern pondmussel, oak hairstreak butterfly, and tall-nut sedge) as potentially occurring along the proposed Project in Massachusetts. Consultation with the CTNDDDB did not identify any state-listed species along the proposed Project in Connecticut.

Algonquin conducted botanical and wildlife surveys of the proposed Project facilities to identify the presence of listed species in the Project area during the 2007 and 2008 field seasons. On September 12, 2008, Algonquin met with the MassNHESP to review the spring and summer special status species survey results, address any outstanding survey needs, and discuss potential conservation measures and permit timeframes. As a result of this meeting, conservation measures were developed to avoid or minimize potential impacts on special status species. These conservation measures are considered draft conservation measures until Algonquin completes its preapplication consultation with the MassNHESP and submits its formal MESA application to the MassNHESP.

Based on the survey results to date and Algonquin's proposed draft conservation measures, we conclude that the Project would have no adverse impacts on any of the state-listed species in Massachusetts with the potential exception of the tall-nut sedge. Algonquin is continuing its consultations with the MassNHESP regarding the tall-nut sedge and would include the impact analysis and final proposed conservation measures in its final MESA application.

Algonquin expects to finalize and submit its MESA application to the MassNHESP in late October 2008. This application would incorporate all field survey results to date, and include an analysis of the potential impacts on state-listed species and a discussion of Algonquin's proposed conservation measures. To ensure that potential impacts on state-listed species would be avoided or mitigated, we are recommending that Algonquin file its final MESA application, the comments of the MassNHESP on the final MESA application, and any additional consultation and clearance letters.

5.1.8 Land Use, Recreation, Special Interest Areas, and Visual Resources

Approximately 80 percent of the pipeline facilities would be constructed within or adjacent to various existing rights-of-way. Of the 12.9 miles of the I-10 Extension, approximately 3.9 miles (30 percent) would be within the existing NSTAR right-of-way, 3.8 miles (29 percent) would be outside but adjacent to the existing NSTAR right-of-way, and 5.2 miles (41 percent) would be constructed on newly created right-of-way. The entire 7.5 miles (100 percent) of the Q-1 System Replacement would be constructed within or adjacent to existing rights-of-way owned by NSTAR or Algonquin. Approximately 9.8 miles (89 percent) of the E-3 System Replacement would be constructed within or adjacent to

Algonquin's existing rights-of-way, and 1.2 miles (11 percent) would be constructed on newly created right-of-way.

Algonquin proposes to generally use a 75- or 85-foot-wide nominal construction right-of-way, consisting of 30 feet of permanent right-of-way and 45 feet of temporary construction workspace in Connecticut, and 50 feet of permanent right-of-way and 35 feet of temporary construction workspace in Massachusetts. However, we are recommending use of a 75-foot-wide construction right-of-way in wetlands, consistent with our Procedures, unless additional site-specific justifications are provided. Construction of the pipeline facilities, including the pipeline right-of-way, temporary extra workspace, access roads, and pipe storage and contractor ware yards would temporarily affect about 464.2 acres of land. Open land would be the primary land use affected by construction of the pipeline facilities totaling about 165.9 acres (36 percent). The remaining land uses that would be disturbed consist of 137.6 acres (30 percent) of forest land, 111.4 acres (24 percent) of commercial/industrial land, 39.7 acres (8 percent) of residential land, 8.3 acres (2 percent) of agricultural land, and 1.3 acres (less than 1 percent) of open water. Most of this land would be allowed to return to previous uses after construction is completed; however, about 80.6 acres of open land, 42.7 acres of forest land, 14.8 acres of commercial/industrial land, 11.6 acres of residential land, 1.1 acres of agricultural land, and 1.1 acres of open water would be retained as new permanent right-of-way. Additionally, about 2.0 acres of forest land, 1.7 acres of commercial/industrial land, 1.2 acres of residential land, and 0.2 acre of open land would be permanently affected to create new or modify existing roads for access. Construction and operation of new aboveground facilities associated with the proposed project would affect 27.9 acres of land, including 21.5 acres of forest land, 6.1 acres of open land, and 0.3 acre of commercial/industrial land. Of this, 11.8 acres of forest land, 3.2 acres of open land, 0.2 acre of commercial/industrial land would be maintained for permanent operation of the facilities.

Algonquin has identified certain areas where it believes site-specific conditions require the use of temporary extra workspace outside of the nominal 85-foot-wide construction right-of-way along the I-10 Extension and Q-1 System Replacement and the nominal 75-foot-wide construction right-of-way along the E-3 Replacement System. We requested that Algonquin file a table listing the locations of these temporary extra workspaces and their dimensions, the acreage of impact, the land use, and the reasons why Algonquin believes the additional workspace is justified. Based on our review, the majority of Algonquin's requests appear justified. However, we cannot approve Algonquin's requests at some of the locations without submittal of additional justification for, or modification of, the workspaces. We are recommending that Algonquin file additional information for these extra workspaces.

Algonquin's proposed construction work area would be located within 50 feet of 176 residential, commercial, or other structures (e.g., garages), of which 127 are residences. Of the 127 residences, 78 would be located within 25 feet of the construction work area, including 23 along the I-10 Extension, 22 along the Q-1 System Replacement, and 33 along the E-3 System Replacement.

Temporary construction impacts on residential areas could include inconvenience caused by noise and dust generated by construction equipment, personnel, and trenching of roads or driveways; ground disturbance of lawns; removal of trees, landscaped shrubs, or other vegetative screening between residences and/or adjacent rights-of-way; potential damage to existing septic systems or wells; and removal of aboveground structures, such as fences, sheds, or trailers, from within the right-of-way.

Algonquin would implement general measures to minimize construction-related impacts on all residences and other structures located within 50 feet of the construction right-of-way, including: 1) attempt to maintain a minimum distance of 25 feet between any residence/business establishment and the edge of the construction work area; 2) install safety fence at the edge of the construction right-of-way for a distance of 100 feet on either side of the residence or business establishment; 3) fence the boundary of

the construction work area to ensure that construction equipment and materials, including the spoil pile, remain within the construction work area; 4) attempt to leave mature trees and landscaping intact within the construction work area unless the trees and landscaping interfere with the installation techniques or present unsafe working conditions; 5) ensure piping is welded and installed as quickly as reasonably possible to minimize the amount of time a neighborhood is affected by construction; 6) backfill the trench as soon as possible after the pipe is laid or temporarily place steel plates over the trench; and 7) complete final cleanup, grading, and installation of permanent erosion control devices within 10 days after backfilling the trench, weather permitting.

In addition to these measures, Algonquin has provided site-specific residential construction plans to inform affected landowners of proposed measures to minimize disruption and to maintain access to the residences located within 25 feet of the construction work area (see Appendix J). These site-specific construction plans include a dimensioned drawing depicting the residence in relation to the pipeline; workspace boundaries; the proposed permanent right-of-way; and nearby residences, structures, roads, and waterbodies. The site-specific plans also include a description of the construction techniques that Algonquin would use to reduce impacts on residences and how Algonquin would ensure the trench is not excavated until the pipe is ready to be installed and that the trench would be backfilled immediately after pipe installation. We have reviewed these plans and find them acceptable. However, because 38 residences would be located within 10 feet of the proposed construction work area, and there is the increased potential for construction of the Project to disrupt these residences, we are recommending that Algonquin file evidence of landowner concurrence with the site-specific residential construction plans for all locations where construction work areas and fencing would be within 10 feet of a residence. We are specifically seeking comments on these plans.

To ensure Algonquin has a system in place to address landowner issues and concerns during and following construction, we are recommending that Algonquin develop and implement an environmental complaint resolution procedure that remains active for at least 3 years following the completion of construction of the E2W Project.

The proposed facilities would not cross any national or state-designated Wild and Scenic Rivers, waterbodies listed on the NRI, Bureau of Land Management land, USDA land, Wetland Reserve Program land, Conservation Reserve Program land, registered natural landmarks, national forests, national parks, state parks, or Indian Reservations.

The I-10 Extension would cross the boundary of the MassCZM's Boston Harbor Region at the Weymouth Fore River between MPs 0.0 and 0.7 in the Towns of Weymouth and Braintree, Massachusetts. As discussed in sections 5.1.3 and 5.1.6, Algonquin plans to cross the Weymouth Fore River using the HDD method, which, if successful, would avoid impacts on the waterbody. If the E2W Project is approved by the Commission, concurrence from the MassCZM that the Project is consistent with CZM program policies must be received before construction. Therefore, we are recommending that Algonquin file documentation of concurrence from the MassCZM that the E2W Project is consistent with CZM program policies.

A review of federal, state, and local government databases identified 145 potential and actual sources of contamination within 1,000 feet of the proposed pipeline centerlines. Of these, the I-10 Extension would be located within 1,000 feet of 76 sites, the Q-1 System Replacement would be located within 1,000 feet of 64 sites, and the E-3 System Replacement would be located within 1,000 feet of 5 sites. No contaminated or potentially contaminated sites were identified within a 0.5-mile radius of the Rehoboth Compressor Station. In addition, Algonquin identified seven sites with a higher likelihood of encountering contamination along the pipeline routes. These sites consist of three landfills in the vicinity of the proposed I-10 Extension, one landfill and two contaminated sites in the vicinity of the proposed Q-

1 System Replacement, and one contaminated site in the vicinity of the proposed E-3 System Replacement. The sites are located at varying distances ranging from 0 to 1,000 feet from the pipeline centerlines.

Algonquin would develop a Contamination Contingency Plan to address contaminated media if encountered during construction of the E2W Project. The plan would comply with all federal, state, and local regulations and would be submitted to the appropriate federal, state, and local regulatory agencies for review and approval. We are recommending that Algonquin file the Contamination Contingency Plan to allow us to determine whether it would adequately minimize impacts if unanticipated hazardous materials/waste are encountered or suspected during construction.

A review of information provided by the MassDEP identified that the Weymouth and Stoughton Landfills would be crossed by the I-10 Extension in Weymouth and Stoughton, Massachusetts, respectively. Information provided by the CTDEP identified a contaminated site (the Guarnaccia Property) that would be crossed by the E-3 System Replacement in Norwich, Connecticut. This site was previously occupied by a gas station that has since been demolished. The Weymouth Landfill was operated as a municipal solid waste landfill from 1924 to 1949, is currently inactive, and is not lined or capped. A portion of the landfill has been redeveloped with a retail store and parking lot. The potential to encounter hazardous materials during construction in the former landfill is low because it was common practice for operators to burn the waste during the time the Weymouth Landfill was active. In the vicinity of the Stoughton Landfill, there is a potential to encounter contaminated media and buried solid waste during construction. Algonquin plans to conduct a field investigation of the Stoughton Landfill to evaluate the presence of hazardous waste within the I-10 Extension right-of-way. At the Guarnaccia Property that would be crossed by the E-3 System Replacement, a Phase I Environmental Site Assessment indicated the presence of petroleum-impacted soils between 0 and 12 feet deep, and semi-VOC and PCBs were detected at the central portion of the site. Algonquin plans to further investigate the environmental issues at this site. To minimize the potential for the E2W Project to encounter contaminated media or buried solid waste and ensure that any such waste would be properly managed, we are recommending that Algonquin prepare and file a report describing the results of its investigations in proximity to the Stoughton Landfill and at the Guarnaccia Property, the methods used to investigate each site, all laboratory test results, a discussion of regulations applicable to the findings, and any proposed mitigation measures, if warranted. A URAM Plan would be required for areas in Massachusetts where soil or groundwater sampling indicates contamination exceeding Reportable Concentrations as defined in the MCP. We are also recommending that Algonquin provide a copy of the URAM Plan if one is required.

The proposed Project would have an impact on visual resources. Along the pipeline routes, visual impacts would be greatest where the route parallels or crosses roads and the pipeline right-of-way may be seen by passing motorists, on residents in areas where vegetation used for visual screening of existing utility rights-of-way or for ornamental value would be removed, and in forested areas. The duration of visual impacts would depend on the type of vegetation that is cleared or altered. About 80 percent of the proposed pipeline routes would be located within or adjacent to existing rights-of-way. Construction within or adjacent to existing rights-of-way typically reduces impacts on visual resources because it minimizes vegetation clearing for the construction work area and permanent right-of-way and also minimizes new fragmentation of vegetation. At the HDD crossings, no impacts on visual resources are anticipated because only selective clearing of vegetation would occur between the drill entry and exit points. After construction, all disturbed areas (excluding the footprint for aboveground facilities) would be restored and returned to preconstruction conditions in compliance with federal, state, and local permits; landowner agreements; and Algonquin's easement requirements.

In locations where trees that serve as a visual buffer would be removed, Algonquin would discuss these screening issues with individual landowners during easement negotiations. In areas where all visual screening is removed, Algonquin would consider strategic planting of fast-growing evergreens. As discussed above, we requested that Algonquin provide site-specific justification for all areas where a wider construction right-of-way and temporary extra workspaces would be needed and specify the land use (vegetative cover type) that would be affected by each extra workspace. Our decision whether to approve or deny the request took vegetative cover type into consideration to ensure unnecessary tree clearing is avoided and visual buffers are preserved to the extent reasonable and practicable.

Aboveground facilities associated with pipeline projects are typically the most visible features and would result in long-term impacts on visual resources. However, the proposed Rehoboth Compressor Station site is located near the center of a 97-acre parcel of land that consists primarily of upland forest. We identified 59 residences within 0.5 mile of the proposed compressor station; however, all residences are located at least 0.25 mile from the site and views of the station would be limited by existing dense mature forest. Within the 97-acre parcel of land, the permanent station footprint would be approximately 10.3 acres. In addition to the 10.3 acres, about 6.5 acres of temporary extra workspace would be required for construction activities. With the exception of an entrance driveway, the remainder of the site would be preserved as screening and buffering for the compressor station or potentially used as conservation or mitigation areas. Algonquin would limit outdoor lighting to the levels necessary for safety and security reasons. The remaining aboveground facilities would consist of relatively small structures that would be located either within the fenceline of existing or other proposed aboveground facilities, or within or near the pipeline right-of-way. In general, these other aboveground facilities would not result in a significant impact on the surrounding visual character of the Project area.

5.1.9 Socioeconomics

Construction of the Project would not have a significant impact on local populations, housing, employment, or the provision of community services. There would be minor temporary increases in traffic levels due to the commuting of the construction workforce to the Project area as well as the movement of construction vehicles and delivery of equipment and materials to the construction right-of-way. Construction of the Project would temporarily increase the demand for public services such as emergency response, medical, and traffic control but these effects would be offset by increases in local government revenues. The only long-term socioeconomic effect of the Project is likely to be beneficial, based on the increase in tax revenues that would accrue to the counties affected by the Project.

5.1.10 Cultural Resources

Algonquin consulted with the MHC and the Connecticut SHPO and has completed cultural resources investigations for the majority of the proposed pipeline routes and ancillary facilities. A total of 253 aboveground cultural resources and 48 belowground cultural resources were recorded during surveys of the proposed Project. Based on Algonquin's surveys and evaluations, 232 of the aboveground cultural resources have been recommended as not eligible for listing on the NRHP and no further work is recommended. The remaining 21 aboveground cultural resources have been recommended as eligible for listing on the NRHP, but would not be affected by Project activities because they are located outside the Project APE.

Forty of the 48 belowground cultural resources identified are recommended as not eligible for listing on the NRHP and no further work is recommended. One site was previously determined as eligible for listing on the NRHP; however, this site has subsequently been destroyed and, therefore, would not be affected by the Project. Of the remaining seven sites, four are recommended as potentially eligible for listing on the NRHP and three are recommended as eligible for listing on the NRHP. If avoidance is

not feasible, testing and/or archival research would be conducted to determine the potential Project impacts.

Based on comments from the MHC and the Connecticut SHPO, Algonquin completed a Stone Wall Survey and Restoration Plan that provides an inventory of all stone walls that would be intersected and potentially impacted by the proposed Project. Algonquin would consider all stone walls affected by the Project to be eligible for listing on the NRHP and has identified procedures to reconstruct affected walls following construction.

In consultation with the MHC and the Connecticut SHPO, Algonquin prepared its Unanticipated Discovery Procedures to be used in the event that cultural resources or human remains are discovered during construction. We find the procedures acceptable.

Algonquin consulted with six Native American tribes, the Massachusetts Commission on Indian Affairs, and the Connecticut Indian Affairs Commission regarding the Project. As of October 2008, three tribes and the Massachusetts Commission on Indian Affairs have provided comments to Algonquin. The Commission's NOI dated October 16, 2007 and Supplemental NOI dated April 14, 2008 were sent to 14 individuals from the 5 Native American tribes.

To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, we are recommending that Algonquin not begin implementation of any treatment plans/mitigation measures (including archaeological data recovery); construction of facilities; or use of all staging, storage, or temporary work areas and new or to-be-improved access roads until it files the remaining cultural resources survey and evaluation reports, any necessary treatment plans, and the comments of the MHC and the Connecticut SHPO on all cultural resources reports and plans submitted for review, and the Director of OEP notifies Algonquin that treatment plans/mitigation measures may be implemented or construction may proceed.

5.1.11 Air Quality and Noise

The E2W Project would generate air emissions associated with both construction and operation. During construction, air emissions would be generated by construction equipment and activities associated with building the proposed Project facilities. The only new source of operational air emissions associated with the E2W Project would be the proposed Rehoboth Compressor Station, as well as periodic blowdown events associated with the pipeline facilities. The Rehoboth Compressor Station would require a Non-Major Comprehensive Plan Approval from the MassDEP. The E2W Project would not be subject to any other air permitting requirements.

The construction activities that would be the greatest emissions-generating activities include clearing, grading, and trenching operations. These construction activities would occur in daylight hours during the construction periods, except in situations where a specific activity would need to be completed without stopping (e.g., road crossings, hydrostatic testing, HDD operation). The intermittent and short-term emissions generated by these activities would include fugitive particulate emissions (i.e., dust) from soil disruption, and combustion emissions from the construction equipment. Emissions associated with construction equipment include PM₁₀, PM_{2.5}, NO_x, CO, SO₂, VOC, and small amounts of air toxics. In areas not designated as Nonattainment or Maintenance for the NAAQS, these emissions could result in minor, temporary impacts on air quality in the vicinity of pipeline installation.

Although Algonquin has stated that fugitive particulate emissions generated during construction would be mitigated, if necessary, by spraying water to dampen the surfaces of dry work areas, Algonquin has not provided a Dust Control Plan. Because the construction work area for the E2W Project would be

within 50 feet of 176 residential or other structures and would cross 67 public roads, we believe that a Dust Control Plan that specifies mitigation measures for dust abatement in addition to spraying of water (e.g., reducing vehicle speeds where appropriate for travel on unsurfaced roads, using palliative in high erosion areas to control dust in residential areas and near road crossings, and training of Project personnel) is necessary. Therefore, we are recommending that Algonquin prepare a Dust Control Plan that specifies the mitigation measures to be used for dust abatement; the performance requirements, if applicable (e.g., visible opacity standards); the individuals with authority to determine when additional dust control measures are necessary; and the individuals with authority to stop work if the contractor does not comply with dust control measures.

All of the counties in which construction would occur are designated as Nonattainment areas for ozone, and Morris County, New Jersey is designated as Nonattainment for PM_{2.5}. Middlesex County, Connecticut is designated as Attainment with a maintenance plan for CO. Based upon the construction and operational emissions estimates provided by Algonquin, the Project emissions would not exceed general conformity *de minimis* thresholds; therefore, a general conformity determination is not required for the Project.

The construction phase of the proposed Project would result in the generation of diesel combustion emissions associated with the operation of construction equipment and vehicles. Massachusetts, Connecticut, Rhode Island, and New Jersey have developed standards to limit emissions from diesel engines through idling restrictions and some of the states in which the Project would occur have developed guidance for other methods of reducing diesel emissions, such as the use of low sulfur diesel, cleaner diesel alternatives fuels, and advanced pollution control technologies. Because Algonquin did not specify measures that it would implement to minimize diesel emissions and comply with the appropriate state standards, we are recommending that it file the specific measures it would implement during construction to minimize diesel combustion emissions and comply with the applicable state diesel emissions standards.

Noise would be generated during construction of the pipeline and aboveground facilities. New sources of operational noise would be the proposed Rehoboth Compressor Station and the proposed modifications to the Burrillville and Cromwell Compressor Stations. The construction noise would be temporary and intermittent because equipment would be operated on an as-needed basis during daylight hours. Pipeline construction generally proceeds at rates ranging from several hundred feet to 1 mile per day. However, construction activities in any one area could last for longer durations based upon sensitive resources or terrain. As discussed above, Algonquin proposes to use the HDD method to cross the Weymouth Fore River in Massachusetts and the Shetucket River in Connecticut. These HDD activities would typically occur continuously (i.e., 24 hours per day) until completion. Based upon noise assessments completed for the HDD sites, with the implementation of Algonquin's mitigation measures (e.g., installation of barriers, using silencers on equipment), the noise generated during these activities would be in compliance with the FERC's noise standard of 55 L_{dn} at the nearest NSA.

Algonquin has submitted noise assessments for the Rehoboth, Burrillville, and Cromwell Compressor Stations. The assessments for the Rehoboth and Burrillville Compressor Stations demonstrate compliance with federal and local noise ordinances based upon certain equipment specifications and noise mitigation measures. To confirm that noise mitigation measures are adequately implemented to ensure compliance with federal and local noise ordinances, we are recommending that Algonquin make all reasonable efforts to ensure its predicted noise levels from the new Rehoboth Compressor Station and modified Burrillville Compressor Station are not exceeded at nearby NSAs and file noise surveys showing this no later than 60 days after placing the new and/or modified compressor stations in service. We are also recommending that if the noise attributable to the operation at full load of the new and/or modified compressor stations exceeds an L_{dn} of 55 dBA at any nearby NSAs, Algonquin

shall file a report on what changes are needed and install additional noise controls to meet the level within 1 year of the in-service date and confirm compliance with this requirement by filing a second noise survey no later than 60 days after it installs the additional noise controls.

The noise contribution from the existing Cromwell Compressor Station when operated at full capacity is currently estimated to exceed the FERC's noise standard of 55 dBA L_{dn} (i.e., before the E2W Project). With the implementation of Algonquin's proposed noise mitigation measures, the modifications to the Cromwell Compressor Station are not predicted to increase noise levels at the nearest NSA. To confirm this, we are recommending that Algonquin file a noise survey to verify that the noise from all the equipment operated at full capacity does not exceed the previously existing noise levels that are at or above an L_{dn} of 55 dBA at the nearby NSAs no later than 60 days after placing the modified units in service. We are also recommending that if any of the noise levels are exceeded, Algonquin shall implement additional noise control measures to reduce the operating noise level at the NSAs to or below the previously existing noise level within 1 year of the in-service date and confirm compliance with this requirement by filing a second noise survey no later than 60 days after it installs the additional noise controls.

Intermittent blowdown events associated with facility operation would generate some air emissions and noise. Although these sources are not regulated under federal and state air permitting programs, they are subject to review under the MEEA's Greenhouse Gas Emissions Policy and Protocol. Algonquin provided estimates of air emissions from blowdown events associated with compressor station operation; however, Algonquin is also proposing to install new remote blow-off valve sites along the pipeline routes. There are some discrepancies in Algonquin's filings regarding the locations of these remote blow-off valve sites and Algonquin did not provide air emissions estimates for these valves. Therefore, we are recommending that Algonquin provide information related to the proposed remote blow-off valves sites to clarify their location; provide an estimate of the potential GHG emissions from these facilities; and, if needed, describe proposed mitigation measures to ensure compliance with the MEEA's Greenhouse Gas Emissions Policy and Protocol. Because Algonquin also did not provide noise estimates for these new remote blow-off valves, we are recommending that Algonquin clarify their proximity to nearby NSAs; estimate the potential noise impact of the facilities on nearby NSAs; compare estimated noise levels to applicable noise ordinances; and, if needed, describe proposed mitigation measures to ensure compliance with applicable federal and local noise ordinances.

5.1.12 Reliability and Safety

The pipeline and aboveground facilities associated with the E2W Project would be designed, constructed, operated, and maintained to meet or exceed the DOT Minimum Federal Safety Standards in Title 49 CFR Part 192 and other applicable federal and state regulations. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, include specifications for material selection and qualification; odorization of gas; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion. By designing and operating the proposed Project in accordance with the applicable standards, the Project would not result in a significant increased public safety risk.

The pipeline facilities would be clearly marked at line-of-sight intervals and at other key points to indicate the presence of the pipeline. The pipeline system would be inspected by air and on the ground to observe right-of-way conditions and identify soil erosion that may expose the pipe, dead vegetation that may indicate a leak in the line, conditions of the vegetative cover and erosion control measures, unauthorized encroachment on the right-of-way such as buildings and other substantial structures, and other conditions that could present a safety hazard or require preventive maintenance or repairs.

Algonquin would perform annual leak detection surveys of the proposed pipeline facilities, which would be instrumental in early detection of leaks and reduce the likelihood for pipeline failure.

Algonquin representatives would meet with the emergency services departments of the municipalities and counties along the proposed pipeline facilities on an ongoing basis as part of its liaison program. Algonquin would provide these departments with emergency numbers and verbal, written, and mapping descriptions of the pipeline system. This liaison program would identify the appropriate fire, police, and public officials and the responsibilities of each organization that may respond to a gas pipeline emergency, and coordinate mutual assistance in responding to emergencies. A liaison with public authorities and local utilities would be maintained at all locations along the pipeline.

NSTAR has raised safety and reliability concerns regarding the proposed I-10 Extension, where approximately 3.9 miles (30 percent) of the pipeline would be located inside of NSTAR's existing powerline right-of-way and an additional 3.8 miles (29 percent) would be located outside of, but generally adjacent to, NSTAR's right-of-way. These concerns include: damage to NSTAR's existing facilities during construction of the pipeline; damage to the proposed pipeline by the use of heavy equipment during emergency and normal maintenance procedures; the simultaneous use by both operators of the existing, limited access points to the right-of-way during an emergency; and safety risk during the installation and operation due to collocating the proposed pipeline in close proximity to high voltage electric transmission facilities.

In response to NSTAR's concerns, Algonquin modified the alignment of the I-10 Extension to increase the separation of the pipeline and the construction work area from the electric transmission facilities. Algonquin has also committed to maintaining a buffer of at least 5 feet between the construction work area and the base of all NSTAR towers, although the alignment sheets filed by Algonquin do not depict the buffer in all cases. In addition, Algonquin would implement special construction techniques to minimize the potential for construction activities to damage NSTAR's facilities. Algonquin plans to collect additional geotechnical information along the proposed route and would refine or modify the proposed construction methods in proximity to NSTAR's towers, if necessary. Algonquin has proposed to provide equipment crossing points along the pipeline that would allow NSTAR access across the pipeline. In these areas, Algonquin would implement measures such as deeper pipe burial or the use of thicker-walled pipe to ensure the integrity of the pipeline. Algonquin provided preliminary information regarding how it would mitigate electrical risks, such as using lightning arrestors along with decoupling devices to protect the pipeline against electrical surges, or zinc ribbon buried parallel to and near the pipeline to mitigate excessive electrical potentials due to both inductive and conductive interference. Algonquin has also committed to employing an electrical engineer specializing in alternating current mitigation to develop a detailed voltage mitigation plan for the E2W Project.

Collocation of natural gas transmission pipelines and electric transmission facilities presents unique safety challenges but is not without precedent, including Algonquin's original Q-1 system pipeline, which is located within approximately 50 feet of 24 NSTAR towers, with the nearest tower being offset by approximately 30 feet. We have concluded that the proposed I-10 Extension could also be safely installed and operated without compromising the integrity or reliability of NSTAR's existing facilities or public safety by implementing the construction measures described by Algonquin, together with continued communication between Algonquin and NSTAR. To ensure this, we are recommending that Algonquin file revised alignment sheets depicting a buffer of at least 5 feet between construction work areas and all NSTAR towers, the results of its future geotechnical investigation of the NSTAR right-of-way, any revisions to its estimated locations where blasting would likely be necessary in or adjacent to NSTAR's right-of-way, and site-specific blasting and construction plans for those areas where the pipelines would be 50 feet or less from an existing tower foundation. We are also recommending that Algonquin file an update regarding its ongoing communications with NSTAR regarding safety and

reliability issues, including any modifications to proposed construction methods, right-of-way access issues, and electrical risk mitigation measures that result from these discussions.

5.1.13 Cumulative Impacts

When the impacts of the E2W Project are considered additively with the impacts of other past, present, or reasonably foreseeable future projects, there is some potential for cumulative effect on resources such as soils, vegetation and wildlife (including special status species), land use, recreation, visual resources, socioeconomics, transportation and traffic, cultural resources, air quality, and noise. However, the E2W Project is not anticipated to significantly add to the negative effects on the resources identified above for the following reasons:

- impacts on resources such as wetlands, waterbodies, vegetative communities, soils, and geology would be minor and short term and would only represent a small portion of the available resources in the region;
- all temporary impacts on wetlands would be restored;
- the amount of permanent wetland loss as a result of construction would be small and appropriately mitigated; and
- resources affected by other projects (e.g., noise, air, and dust impacts) may be too far from the E2W Project to result in an additive effect.

Of the 12 projects we reviewed that would affect similar resources, we determined that 5 would not have a cumulative impact because they would not be constructed within the same timeframe as the E2W Project. The majority of the impacts of the proposed Project would be temporary or short term and minimized by implementation of the various plans developed by Algonquin. Because Algonquin would restore all disturbed areas to preconstruction conditions, the overall impact on resources from the E2W Project would be reduced on a regional basis. For these reasons, we conclude that the E2W Project would not significantly add to cumulative impacts on resources on a regional scale.

5.1.14 Growth-inducing Impacts

The E2W Project would provide temporary employment for up to 840 workers during the peak construction months. However, about 40 to 50 percent of these workers would be local hires and the duration of the construction period is anticipated to be only about 6 months. Although the proposed Project is expected to have a short-term positive effect on the area rental industry through increased demand and higher rates of occupancy, no significant impacts on the local housing markets are expected. Three permanent employees would be required for operation and maintenance of the proposed Project, and Algonquin plans on relocating 10 employees currently working at its Dighton office to the Rehoboth Compressor Station for a total of 13 permanent employees. This total number of permanent employees would have little or no impact on the population in the region and would have a negligible effect on existing public infrastructure and community services.

The proposed Project was developed in response to significant interest from shippers that require transportation capacity to accommodate increased receipts of natural gas at the east end of the Algonquin system for redelivery to high growth markets in the Northeast. The Project area is already served by various fuel supplies and increased demand for natural gas is already taking place. We have concluded that the demand for energy and the proposed Project are a result of, rather than a precursor to, development in this region.

5.1.15 Alternatives

We evaluated several alternatives to the E2W Project to determine whether they would be reasonable and environmentally preferable to the proposed Project. The No Action Alternative and the Postponed Action Alternative were considered. If the FERC and/or another federal agency with approval authority were to deny or postpone action on Algonquin's applications, the environmental impacts associated with the Project would be avoided or postponed. However, the stated objectives of the Project would not be met.

The use of alternative fuels, renewable fuels, and energy conservation programs was considered but would not offer environmentally preferable, technically feasible, or viable alternatives to the proposed Project in a similar timeframe.

Alternatives involving the use of existing pipeline systems operated by companies other than Algonquin were evaluated. No existing pipeline system was identified in the Project area with the available capacity to deliver the volume of natural gas that would be delivered by Algonquin without the construction of new facilities. Any such expansion would result in environmental impacts that could be similar to or greater than the impacts associated with the E2W Project. Furthermore, we are not aware of any plans to expand an existing pipeline system that would meet the Project objectives within the same general timeframe. For the above reasons, the use of an existing pipeline system is not considered a viable alternative to the proposed Project.

We considered three modifications to Algonquin's existing system as alternatives to various elements of the proposed Project. The first modification would involve increasing compression on Algonquin's existing pipelines by either modifying existing compressor stations or constructing new compressor facilities. According to Algonquin, increased compression could result in operational concerns such as exceeding the MAOP of Algonquin's existing pipelines, gas velocities that are too high, or suction pressures that are too low at compressor stations. The construction and operation of new compressor facilities would also result in their own environmental impacts. The second modification we considered would involve looping, rather than replacing, the Q-1 and E-3 systems. Algonquin has stated that looping of the Q-1 and E-3 systems would provide the same performance as the proposed Q-1 and E-3 System Replacements. However, looping the existing pipelines would increase Algonquin's existing permanent right-of-way, which would result in greater permanent impacts than replacing the pipelines as proposed. Because of these operational and environmental concerns, we do not consider increased compression or looping of the E-3 and Q-1 systems to be viable or environmentally preferable alternatives to the proposed Project.

The third modification to Algonquin's existing pipeline system we considered would involve upgrades to the Q-1, I-3, I-8, and I-9 systems to provide comparable delivery capacity to the proposed I-10 Extension. Two alternatives were evaluated: the I-System Replacement Alternative and the I-3 System Alternative. The I-System Replacement Alternative would eliminate the need for the I-10 Extension by replacing approximately 11.5 miles of existing 16- to 24-inch-diameter pipeline with new 36- to 42-inch-diameter pipeline. The I-3 System Alternative would replace approximately 8.2 miles of existing pipeline with larger diameter pipeline but, unlike the I-System Alternative, would include the first 3.2 miles of the I-10 Extension and 1.1 miles of new pipeline right-of-way along State Route 3. The I-System Replacement Alternative and I-3 System Alternative each offer a number of environmental advantages when compared to their corresponding segments of the I-10 Extension, including less impact on forested wetlands; forested uplands; ACECs; ORWs; and rare, threatened, and endangered species habitat. However, a significant disadvantage of each alternative is the impact that construction and operation of either alternative would have on residences, businesses, and traffic when compared to their corresponding segment of the I-10 Extension. Specifically, the I-System Replacement Alternative would

be located within 50 feet of 323 more structures, cross 16 more roads, and require 2.2 more miles of in-road construction. The I-3 System Alternative would be located within 50 feet of 166 more structures, cross 17 more roads, and require 1.4 miles of in-road construction. Furthermore, due to the density and close proximity of both alternatives to existing development and infrastructure, Algonquin identified other significant construction constraints with each alternative, and each would require Algonquin to install new pressure regulation facilities and/or modify existing pressure regulation facilities. Therefore, although the I-System Replacement Alternative and the I-3 System Alternative both offer some environmental advantages over their corresponding portions of the I-10 Extension, each has significant drawbacks primarily associated with proximity to existing residences and other constructability concerns which, on balance, lead us to conclude that neither is preferable to the proposed I-10 Extension.

The I-System Replacement Alternative is preferred by NSTAR primarily because it would avoid existing NSTAR powerline rights-of-way. NSTAR's concerns regarding construction, safety, and reliability are summarized in section 5.1.12 and addressed in the applicable resource discussions in section 4.0. NSTAR also believes that the I-10 Extension could prevent the expansion of electric transmission capacity in the existing right-of-way. However, NSTAR has not made a compelling argument supported by details that leads us to conclude that the proposed I-10 Extension would necessarily preclude NSTAR's ability for future expansion or that it would, by itself, force NSTAR to build a future expansion outside of the existing right-of-way. Rather, it has been our experience that overhead powerlines and buried pipelines can coexist in the same corridor and that potential conflicts between the two can generally be reconciled through close coordination and cooperation between the electric and natural gas transmission companies. As discussed in section 5.1.12, we are recommending that Algonquin file an update of its communications with NSTAR and other information pertaining to pipeline construction and operational safety within the NSTAR right-of-way.

Six route alternatives to the proposed I-10 Extension were considered, including three routes in proximity to the Cranberry Brook Watershed ACEC and three routes in the Canton/Stoughton area. The primary advantage of the three Cranberry Brook ACEC alternatives is that each would reduce land disturbance within the ACEC by between 10.3 and 17.3 acres. However, in nearly every other respect the alternatives are inferior to the proposed alignment in the ACEC area. Specifically, each alternative would result in greater impacts on wetlands, forested wetlands, upland forest, and threatened and endangered species habitat. Each alternative would also require more waterbody crossings and would be located in proximity to more certified and potential vernal pools. For these reasons and because the I-10 Extension would be located in or adjacent to the existing NSTAR right-of-way across the ACEC, we have concluded that the three Cranberry Brook ACEC alternatives are not environmentally preferable to the proposed alignment of the I-10 Extension through the ACEC.

The three route alternatives in the Canton/Stoughton area were evaluated in response to concerns raised by local residents and the Town of Stoughton. The Central Street Alternative and the I-2 Replacement Alternative would offer some environmental benefits compared to the corresponding segment of the I-10 Extension. However, each alternative also has environmental drawbacks including their added length and proximity to more residences and other structures. More specifically, the Central Street Alternative construction work area would be within 50 feet of 109 more structures including 100 residences, and would require 2.5 more miles of in-road construction. The I-2 Replacement Alternative would not cross as developed an area as the Central Street Alternative, but would still be located within 50 feet of 16 more structures, most of which are residences. We have concluded that, on balance, neither the Central Street Alternative nor the I-2 Replacement Alternative is environmentally preferable to their corresponding segments of the I-10 Extension.

The third route alternative we evaluated in the Canton/Stoughton area is the NSTAR Alternative, which was Algonquin's originally proposed alignment through the area that was subsequently changed

after concerns were raised during the Pre-Filing Process by town officials and residents. The primary advantages of the NSTAR Alternative are that it would require approximately 1.1 fewer miles of new pipeline right-of-way, would impact less wetlands, forested wetlands, and upland forest, and would be located within 50 feet of 8 fewer structures than the corresponding segment of the I-10 Extension. However, upon closer examination, some of these advantages are less compelling than they appear. The NSTAR Alternative also has environmental disadvantages, the primary one being an additional 10.4 acres of impact on public open spaces. This open space is forested and, thus, construction of the pipeline through the area would result in a new, permanent corridor through the area. Another disadvantage of the NSTAR Alternative is that it could negate the Agreement between Algonquin and the Town of Stoughton in which Algonquin would transfer ownership of 96.0 acres of property (the Gibson Property). Of the 96.0 acres, 46.2 acres would be placed in a conservation easement pursuant to Algonquin's COE permit and wetland mitigation requirements. The conservation easement would also protect 23.7 acres of upland forest, which would offset the additional acreage of upland forest that would be cleared along the corresponding segment of the proposed route. In weighing the various aspects of the NSTAR Alternative, we concluded in section 3.0 that it possessed adequate environmental advantages that warranted further review and we evaluated it in further detail in each of the resource discussions in section 4.0. After the additional analysis, we have concluded that the NSTAR Alternative is not environmentally preferable to the corresponding segment of the proposed route.

Algonquin planned the proposed facilities to minimize impacts by following existing rights-of-way where possible. As a result, approximately 80 percent of the proposed pipeline facilities would be constructed within or adjacent to existing rights-of-way. However, prior to and after submittal of its application, Algonquin identified several areas along the proposed E2W Project pipeline routes where site-specific conditions such as rock outcroppings, unstable soils, residences, and existing infrastructure require minor variations from the originally proposed route, including minor deviations from the existing pipeline or powerline rights-of-way. In total, 26 minor route variations were adopted during the Pre-Filing Process and 35 were adopted after Algonquin filed its application. Some of the minor route variations were adopted to reduce impacts on sensitive resources (e.g., vernal pools and other wetlands), whereas others were adopted due to constructability issues (e.g., steep slopes, road crossings). In the case of the I-10 Extension, the majority of these minor route variations were identified during ongoing consultations between Algonquin and NSTAR in an attempt to address NSTAR's concerns and minimize potential construction or operational conflicts with NSTAR's electric transmission line system. In the case of the Q-1 and E-3 systems, these minor variations would preclude using the lift and replace method (i.e., removing the existing pipeline and then installing the replacement pipeline in the same ditch). We consider the minor route variations to be both warranted and preferable and agree that they should be part of the proposed route.

We also evaluated five alternative locations for the proposed Rehoboth Compressor Station. The proposed location is at the junction of Algonquin's G-1 and G-5 systems and, according to Algonquin's hydraulic studies, is optimally located to meet the necessary compression requirements of the E2W Project. Thus, all of the alternative locations are located within 0.7 mile of the proposed location. Due primarily to a combination of inadequate size, proximity to residences, site constructability concerns associated with the presence of wetlands, and increased length of connecting pipelines, we determined that none of the five alternative locations are environmentally preferable to the proposed location.

The majority of the other proposed aboveground facilities are either modifications of existing facilities that would be located within the fencelines of existing compressor stations, collocated with other similar existing facilities along Algonquin's existing right-of-way, or would have relatively minor impacts in upland areas. Because no significant environmental resources would be impacted by these facilities, we conclude that no environmentally preferable alternative exists. We have some concerns, however, about the proposed location of a remote blow-off valve near MP 1.3 of the I-10 Extension and

are recommending that Algonquin prepare an alternatives analysis that evaluates modifications to the proposed valve site to minimize potential visual, vegetation, and wetland impacts, and evaluates a site adjacent to the southeast side of Roosevelt Road that is approximately 350 feet south of the currently proposed site from an environmental and engineering perspective, including access to the site.

With the potential exception of the blow-off valve at MP 1.3 of the I-10 Extension, we have determined that Algonquin's proposed Project, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Project objectives.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the E2W Project is approved, the FERC staff recommends that the following measures be included as specific conditions of the Commission's authorization to further mitigate the environmental impact associated with the construction and operation of the Project.

1. Algonquin shall follow the construction procedures and mitigation measures described in its application, supplemental filings (including responses to staff data requests), and as identified in the EIS, unless modified by the Order. Algonquin must:
 - a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
 - b. justify each modification relative to site-specific conditions;
 - c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
 - d. receive approval in writing from the Director of OEP **before using that modification**.
2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the project. This authority shall allow:
 - a. the modification of conditions of the Commission's Order; and
 - b. the design and implementation of any additional measures deemed necessary (including stop work authority) to ensure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from project construction and operation.
3. **Prior to any construction**, Algonquin shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.
4. The authorized facility locations shall be as shown in the EIS, as supplemented by filed alignment sheets, and shall include all of the staff's recommended facility locations. **As soon as they are available, and prior to the start of construction**, Algonquin shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

Algonquin's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Algonquin's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas pipeline to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Algonquin shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage and ware yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, and documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **prior to construction** in or near that area.

This requirement does not apply to route variations required herein or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

- a. implementation of cultural resources mitigation measures;
 - b. implementation of endangered, threatened, or special concern species mitigation measures;
 - c. recommendations by state regulatory authorities; and
 - d. agreements with individual landowners that affect other landowners or would affect sensitive environmental areas.
6. **Prior to construction**, Algonquin shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Algonquin must file revisions to the plan as schedules change. The plan shall identify:
 - a. how Algonquin will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EIS, and required by the Order;
 - b. the number of EIs assigned per spread, and how Algonquin will ensure that sufficient personnel are available to implement the environmental mitigation;
 - c. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
 - d. what training and instructions Algonquin will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change), with the opportunity for OEP staff to participate in the training session;
 - e. the company personnel (if known) and specific portion of Algonquin's organization having responsibility for compliance;
 - f. the procedures (including use of contract penalties) Algonquin will follow if noncompliance occurs; and

- g. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:
 - i. the completion of all required surveys and reports;
 - ii. the mitigation training of onsite personnel;
 - iii. the start of construction; and
 - iv. the start and completion of restoration.
7. Algonquin shall employ one or more EIs per construction spread. The EIs shall be:
- a. responsible for monitoring and ensuring compliance with all mitigative measures required by the Order and other grants, permits, certificates, or other authorizing documents;
 - b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract and any other authorizing document;
 - c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
 - d. a full-time position, separate from all other activity inspectors;
 - e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
 - f. responsible for maintaining status reports.
8. Algonquin shall file updated status reports with the Secretary on a **weekly** basis **until all construction-related activities, including restoration, are complete for each phase of the Project**. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:
- a. the current construction status of each spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;
 - b. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
 - c. a description of corrective actions implemented in response to all instances of noncompliance, and their cost;
 - d. the effectiveness of all corrective actions implemented;
 - e. a description of any landowner/resident complaints that may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
 - f. copies of any correspondence received by Algonquin from other federal, state, or local permitting agencies concerning instances of noncompliance, and Algonquin's response.
9. Algonquin must receive written authorization from the Director of OEP **before commencing service** from the Project. Such authorization will only be granted following a determination that rehabilitation and restoration of areas affected by the Project are proceeding satisfactorily.
10. **Within 30 days of placing the authorized facilities in service**, Algonquin shall file an affirmative statement with the Secretary, certified by a senior company official:

- a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
 - b. identifying which of the Certificate conditions Algonquin has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.
11. Algonquin shall prepare an alternatives analysis for the proposed blow-off valve near MP 1.3 of the I-10 Extension. The analysis shall evaluate modifications to the proposed valve site to minimize potential visual, vegetation, and wetland impacts, and evaluate a site adjacent to the southeast side of Roosevelt Road that is approximately 350 feet south of the currently proposed location from an environmental and engineering perspective, including access to the site. Algonquin may discuss any other factors that are relevant to the site selection. Algonquin shall file this alternatives analysis with the Secretary **during the draft EIS comment period.** (*section 3.6.2*)
 12. Algonquin shall revise its E&SCP to include soil compaction testing and mitigation measures consistent with sections V.C.1 and V.C.3 of the FERC Plan. Algonquin shall file the revised E&SCP with the Secretary for review and written approval by the Director of OEP **prior to construction.** (*section 4.2.2*)
 13. Algonquin shall revise its SPCC Plan to prohibit refueling within 200 feet of any private water supply well and 400 feet of any public water supply well. Algonquin shall file the revised SPCC Plan with the Secretary for review and written approval by the Director of OEP **prior to construction.** (*section 4.3.1.7*)
 14. **Prior to construction,** Algonquin shall file with the Secretary the field verified locations, by milepost, of all water supply wells and springs within 150 feet of construction work areas. **Within 30 days of placing the facilities in service,** Algonquin shall file a report with the Secretary discussing whether any complaints were received concerning well yield or water quality and how each was resolved. (*section 4.3.1.7*)
 15. Algonquin shall file final site-specific HDD crossing plans and alignment sheets that depict consistent construction work areas for the HDDs of the Weymouth Fore and Shetucket Rivers with the Secretary for review and written approval by the Director of OEP **prior to construction.** (*section 4.3.2.4*)
 16. Algonquin shall revise its HDD Contingency Plan to specify the sources of water that would be used for the drilling mud at each proposed HDD crossing. Algonquin shall file the revised HDD Contingency Plan with the Secretary for review and written approval by the Director of OEP **prior to construction.** (*section 4.3.2.4*)
 17. In the event of an unsuccessful HDD, Algonquin shall file with the Secretary a plan for crossing the waterbody. This shall be a site-specific plan that includes scaled drawings identifying all areas that would be disturbed by construction. Algonquin shall file this plan concurrent with the submission of its application to the COE for a permit to construct using this plan. The Director of OEP must review and approve this plan in writing **before construction of the crossing.** (*section 4.3.2.4*)
 18. Algonquin shall revise its alignment sheets and E&SCP to be consistent with section VI.A.3 of the FERC Procedures, or prepare a site-specific analysis of each wetland area, including soils

characteristics and other factors, that would justify use of a greater than 75-foot-wide right-of-way. Algonquin shall file the revised alignment sheets and E&SCP or site-specific analysis of each wetland area with the Secretary **during the draft EIS comment period.** (*section 4.4.3*)

19. Algonquin shall file information regarding its compensatory wetland mitigation plan that includes:
 - a. a description of any additional sites under consideration to fulfill the 1:15 wetland preservation ratio required by the COE;
 - b. the acreage of wetlands that would be preserved on each site;
 - c. details of any conservation restrictions that would be placed on each site; and
 - d. the comments of the COE on the compensatory wetland mitigation plan.

Algonquin shall file this information with the Secretary **during the draft EIS comment period.** (*section 4.4.4*)

20. Algonquin shall file a description of the native seed mix that would be used in the Cranberry Brook Watershed ACEC along with the comments of the MassNHESP and the MassDCR on the selected seed mix with the Secretary **prior to construction across the ACEC.** (*section 4.5.3*)
21. Algonquin shall assess the potential to reduce the construction right-of-way width at MPs 10.8 of the I-10 Extension; MPs 14.5 and 16.0 of the Q-1 System Replacement; and MPs 1.4, 4.4, 9.8, and 10.0 of the E-3 System Replacement to avoid or reduce impacts on vernal pools at these locations. Algonquin shall file revised alignment sheets that depict the reduced construction right-of-way width for all locations where Algonquin determines that a reduction is feasible. If Algonquin determines that reducing the construction right-of-way width is not feasible at any of these locations, it shall provide a site-specific explanation of the conditions that would not permit a workspace reduction. Algonquin shall file its assessment and the applicable revised alignment sheets with the Secretary **during the draft EIS comment period.** (*section 4.6.1.4*)
22. Algonquin shall continue to consult with the COE, the MassNHESP, the MassDEP, and the CTDEP to determine additional recommended mitigation measures to minimize impacts on vernal pools. Algonquin shall file a description of the agency recommendations and specifically identify the additional mitigation measures it would implement with the Secretary **during the draft EIS comment period.** (*section 4.6.1.4*)
23. Algonquin shall file its final MESA application, the comments of the MassNHESP on the final MESA application, and any additional consultation and clearance letters with the Secretary **during the draft EIS comment period.** (*section 4.7.4*)
24. Algonquin shall file a site-specific request and justification for each unapproved extra workspace listed in table E-1 in Appendix E of the EIS with the Secretary **during the draft EIS comment period.** (*section 4.8.1*)
25. **Prior to construction,** Algonquin shall file with the Secretary evidence of landowner concurrence with the site-specific residential construction plans for all locations where construction work areas and fencing would be within 10 feet of a residence. (*section 4.8.3.1*)
26. Algonquin shall develop and implement an environmental complaint resolution procedure that remains active for at least 3 years following the completion of construction of the E2W Project. The procedure shall provide landowners with clear and simple directions for identifying and

resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. Algonquin shall file the environmental complaint resolution procedures and mail the environmental complaint resolution procedures to each landowner whose property would be crossed by the Project with the Secretary **prior to construction**.

- a. In its letter to affected landowners, Algonquin shall:
 - i. provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon to expect a response;
 - ii. instruct the landowners that, if they are not satisfied with the response, they should call Algonquin's Hotline, as applicable; the letter should indicate how soon to expect a response; and
 - iii. instruct the landowners that, if they are still not satisfied with the response from Algonquin's Hotline, they should contact the Commission's Enforcement Hotline at (888) 889-8030, or at hotline@ferc.gov.
 - b. In addition, Algonquin shall include in its weekly status reports (see condition no. 8) a table that contains the following information for each problem/concern:
 - i. the identity of the caller and the date of the call;
 - ii. the identification number from the certificated alignment sheet(s) of the affected property and appropriate location by milepost;
 - iii. a description of the problem/concern; and
 - iv. an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved. (*section 4.8.3.1*)
27. Algonquin shall file documentation of concurrence from the MassCZM that the E2W Project is consistent with CZM program policies with the Secretary **prior to construction**. (*section 4.8.4.1*)
28. Algonquin shall file the Contamination Contingency Plan with the Secretary for review and written approval by the Director of OEP **prior to construction**. (*section 4.8.5*)
29. Algonquin shall prepare a report describing the results of its investigations in proximity to the Stoughton Landfill near MP 10.1 of the I-10 Extension and at the Guarnaccia Property near MP 3.3 of the E-3 System Replacement. This report shall describe the methods used to investigate each site, all laboratory test results, a discussion of regulations applicable to the findings, and any proposed mitigation measures, if warranted. Algonquin shall also provide a copy of the URAM Plan if one is required. This report and the URAM Plan shall be filed with the Secretary for review and written approval by the Director of OEP **before commencing construction at MPs 9.6 to 10.3 of the I-10 Extension and MPs 3.2 to 3.4 of the E-3 System Replacement**. (*section 4.8.5*)
30. Algonquin shall not begin implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; or use of all staging, storage, or temporary work areas and new or to-be-improved access roads **until**:
- a. Algonquin files with the Secretary cultural resources survey and evaluation reports, any necessary treatment plans, and the MHC's and Connecticut SHPO's comments on the reports and plans; and

- b. the Director of OEP reviews all cultural resources reports and plans, and notifies Algonquin in writing that treatment plans/mitigation measures may be implemented or construction may proceed.

All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **“CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE.”** (section 4.10.4)

31. Algonquin shall prepare a Dust Control Plan that specifies:
 - a. the sources of water that would be used for dust control;
 - b. the anticipated quantities of water that would be required;
 - c. measures to minimize fish and fish egg entrainment during dust control water withdrawals if a surface water source would be used;
 - d. the mitigation measures to be used for dust abatement;
 - e. the performance requirements, if applicable (e.g., visible opacity standards);
 - f. the individuals with authority to determine when additional dust control measures are necessary; and
 - g. the individuals with authority to stop work if the contractor does not comply with dust control measures.

The Dust Control Plan shall be filed with the Secretary **during the draft EIS comment period.** (sections 4.3.2.10 and 4.11.1.3)

32. Algonquin shall file the specific measures it would implement during construction to minimize diesel combustion emissions and comply with the applicable state diesel emissions standards with the Secretary **during the draft EIS comment period.** (section 4.11.1.3)
33. Algonquin shall make all reasonable efforts to ensure its predicted noise levels from the new Rehoboth Compressor Station and modified Burrillville Compressor Station are not exceeded at nearby NSAs and file noise surveys showing this with the Secretary **no later than 60 days after placing the new and/or modified compressor stations in service.** However, if the noise attributable to the operation at full load of the new and/or modified compressor stations exceeds an L_{dn} of 55 dBA at any nearby NSAs, Algonquin shall file a report on what changes are needed and shall install additional noise controls to meet the level **within 1 year of the in-service date.** Algonquin shall confirm compliance with this requirement by filing a second noise survey with the Secretary **no later than 60 days after it installs the additional noise controls.** (section 4.11.2.3)
34. Algonquin shall file a post-construction noise survey for the Cromwell Compressor Station **no later than 60 days after placing the modified units in service.** The results of the noise survey are to verify that the noise from all the equipment operated at full capacity does not exceed the previously existing noise levels that are at or above an L_{dn} of 55 dBA at the nearby NSAs. If any of these noise levels are exceeded, Algonquin shall implement additional noise control measures to reduce the operating noise level at the NSAs to or below the previously existing noise level **within 1 year of the in-service date.** Algonquin shall confirm compliance with this requirement by filing a second noise survey with the Secretary **no later than 60 days after it installs the additional noise controls.** (section 4.11.2.3)

35. Algonquin shall provide information related to the proposed remote blow-off valve sites that includes:
- a. the specific location of all proposed remote blow-off valve sites and their proximity to nearby NSAs;
 - b. an estimate of the potential GHG emissions from these facilities;
 - c. if needed, a description of proposed mitigation measures to ensure that these emissions would comply with the MEEA's Greenhouse Gas Emissions Policy and Protocol;
 - d. an estimate of the potential noise impact of the remote blow-off valves on nearby NSAs, including estimated blowdown frequency and duration and estimated noise levels at NSAs during blowdown events; and
 - e. a comparison of the estimated noise levels to applicable noise ordinances, and, if needed, a description of proposed mitigation measures to ensure that noise resulting from remote blowdown activities would comply with federal and local noise ordinances, including the FERC's 55 dBA L_{dn} .

Algonquin shall file this information with the Secretary **during the draft EIS comment period.**
(sections 4.11.1.5 and 4.11.2.3)

36. Algonquin shall file the following information related to the collocation of its facilities with the NSTAR facilities:
- a. revised alignment sheets depicting a buffer of at least 5 feet between construction work areas and all NSTAR towers;
 - b. the results of its future geotechnical investigation of the NSTAR right-of-way and any revisions to its estimated locations where blasting would likely be necessary in or adjacent to NSTAR's right-of-way;
 - c. site-specific blasting plans for those areas where the pipelines would be 50 feet or less from an existing tower foundation, including the subsurface extent of the foundations;
 - d. site-specific construction plans for those areas where the pipelines would be 50 feet or less from an existing tower foundation, including the subsurface extent of the foundations, and where special construction procedures would be used to protect the integrity of NSTAR's facilities; and
 - e. an update of its ongoing communications with NSTAR regarding safety and reliability issues, including any modifications to proposed construction methods, right-of-way access issues, and electrical risk mitigation measures that result from these discussions.

Algonquin shall file this information with the Secretary **during the draft EIS comment period.**
(section 4.12.2)