NEW ENGLAND CLEAN ENERGY CONNECT

ENVIRONMENTAL ASSESSMENT

DOE/EA-2155

U.S. DEPARTMENT OF ENERGY
OFFICE OF ELECTRICITY
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Acronyms and Abbreviations

°F	degrees Fahrenheit
AC	alternating current
ACHP	Advisory Council on Historic Preservation
ANSI	American National Standards Institute
ANST	Appalachian National Scenic Trail
APA	Administrative Procedure Act
APE	Area of Potential Effect
ATV	all-terrain vehicle
BA	Biological Assessment
BO	Biological Opinion
BP	before present
CadnaA	Computer Aided Design for Noise Abatement
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CH_4	methane
CMP	Central Maine Power Company
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2-equivalent
CPCN	Certificate of Public Convenience and Necessity
CWA	Clean Water Act
dB	decibels
DC	direct current
DEM	Digital Elevation Model
DHHS	Department of Health and Human Services (Maine)
DOE	United States Department of Energy
DOI	United States Department of the Interior
DOT	Department of Transportation
DPS	Distinct Population Segment
DSM	Digital Surface Model
DTM	Digital Terrain Model
DWA	Deer Wintering Area
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMF	electromagnetic field
EO	Executive Order

EPRI	Electric Power Research Institute
ESA	Endangered Species Act
ESC	erosion and sedimentation control
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
FIWGEJ	Federal Interagency Working Group on Environmental Justice
G	gauss
GHGs	Greenhouse gasses
GIS	Geographic Information Systems
GOM DPS	Gulf of Maine Distinct Population Segment
HAPs	Hazardous Air Pollutants
HDD	horizontal directional drilling
HQP	Hydro-Québec Power
HQT	Hydro-Québec TransEnergie, Inc.
HUC	Hydrologic Unit Code
HVDC	high voltage, direct current
Hz	Hertz
ICES	International Committee on Electromagnetic Safety
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronic Engineers
IFC	Issued for Construction
IFP	Issued for Permitting
ILF	In-Lieu Fee
IPaC	Information, Planning, and Consultation System
IWWH	Inland Waterfowl and Wading Habitat
km	kilometer
KOPs	key observation points
kV	kilovolt
kV/m	kilovolts per meter
LEI	London Economics International
L_{eq}	equivalent sound level
LUPC	Land Use Planning Commission
LUST	leaking underground storage tank
MDEP	Maine Department of Environmental Protection
MDIFW	Maine Department of Inland Fisheries and Wildlife
MELCD	Maine Land Cover Database
MEMA	Maine Emergency Management Agency
MESA	Maine Endangered Species Act
mG	milligauss

MHPC	Maine Historic Preservation Commission
mi^2	square miles
MNAP	Maine Natural Areas Program
MOA	Memorandum of Agreement
mph	Miles per hour
MPRP	Maine Power Reliability Program
MPUC	Maine Public Utilities Commission
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NECEC	New England Clean Energy Connect
NECEC LLC or the applicant	NECEC Transmission LLC
NED	National Elevation Data
NEPA	National Environmental Policy Act
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act of 1966
NIEHS	National Institute of Environmental Health Sciences
NLEB	Northern Long-eared Bat
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NO_X	nitrogen oxides
NPL	National Priorities List
NPS	National Park Service
NRHP	National Register of Historic Places
NRPA	Natural Resources Protection Act
NRPB	National Radiological Protection Board of Great Britain
NSS	Northern Spring Salamander
O_3	ozone
OE	DOE Office of Electricity
OSD	Official Series Description
Pb	lead
PBFs	physical and biological features
PBO	Programmatic Biological Opinion
PCEs	primary constituent elements
PEM/PSS	palustrine emergent/palustrine scrub/shrub
PFO	palustrine forested
PM_{10}	particulate matter 10 microns in diameter and smaller
$PM_{2.5}$	particulate matter 2.5 microns in diameter and smaller
PPA	Power Purchase Agreement
RBM	Roaring Brook Mayflies

RECs	Renewable Energy Certificates
RFP	Request for Proposal
ROW	right of way
RPS	Renewable Portfolio Standard
RV	Recreational Vehicle
SF_6	Sulfur Hexafluoride
SHPO	State Historic Preservation Office
SLC9	Maine Site Law Certification
SLODA	Site Location of Development Act
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SSURGO	Soil Survey Geographic Database
SVP	significant vernal pool habitat
SWPPP	stormwater pollution prevention plan
THPO	Tribal Historic Preservation Officer
TWh	terawatt-hour
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USDA-NRCS	United States Department of Agriculture – Natural Resources Conservation Service
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Services
USTs	underground storage tanks
VCP	Vegetation Clearing Plan
VIA	Visual Impact Analysis
VMP	Vegetation Management Plan
VOCs	Volatile organic compounds
WNS	White Nose Syndrome
WNSZ	White Nose Syndrome Zone
WOSS	Wetlands of Special Significance

Chapter 1
Introduction

Central Maine Power Company (CMP) applied on July 27, 2017 to the United States Department of Energy (DOE) for a Presidential permit authorizing the construction, operation, maintenance, and connection of facilities at the international border between the United States and Canada for its New England Clean Energy Connect (NECEC) project (hereafter referred to as the Proposed Project). On August 26, 2019, CMP requested that DOE transfer the Presidential permit application to NECEC Transmission LLC (NECEC LLC or the applicant). In a letter dated January 6, 2021, CMP notified DOE that the project was transferred to NECEC Transmission LLC on January 4, 2021.

DOE is evaluating the Presidential permit application pursuant to Executive Order (EO) 10485 (September 3, 1953), as amended by EO 12038 (February 3, 1978) and DOE's regulations at 10 Code of Federal Regulations (CFR) 205.320 *et seq.*, "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries." DOE may issue a Presidential permit if it determines that issuance of the permit is consistent with the public interest and after obtaining favorable recommendations from the U.S. Departments of State and Defense. DOE has prepared this Environmental Assessment (EA) to inform the Department's public interest determination.

The Presidential permit, if issued, would authorize the construction, operation, maintenance, and connection of the Proposed Project at the Québec–Maine border. The Presidential permit, while necessary, is not a substitute for other authorizations required by Federal, state, and local entities and which are outside of DOE's regulatory authority.

NECEC LLC would develop the following proposed transmission facilities running to the point of first interconnection with the New England Transmission System at CMP's existing Larrabee Road Substation in Lewiston, Maine: (1) the segment from the Québec-Maine border up to and including the first transmission line pole in Maine; (2) approximately 145.3 miles of +/- 320 kilovolt (kV) mostly[1] overhead high voltage, direct current (HVDC) transmission line from the proposed border crossing to an interconnection point in Lewiston, Maine; (3) a new +/- 320-kV DC to 345-kV alternating current (AC) 1,200 MW converter station near Merrill Road in Lewiston Maine, which would convert the electrical power from DC to AC; (4) a 1.2 mile, above-ground 345-kV AC transmission line from the proposed new Merrill Road Converter Station to the existing Larrabee Road Substation in Lewiston, Maine; and (5) a 345-kV line terminal at the Larrabee Road Substation. Though DOE's authority is limited to the border crossing, this EA analyzes potential environmental impacts associated with Segments 1 through 3, that is, up to the converter station and interconnection with the electricity grid. Segments 4 and 5 are not part of the scope of this EA.[2] Segments 4 and 5 generally include upgrades to existing transmission lines and facilities that are not part of the Presidential permit application. The NECEC project requires construction of several reinforcements to the transmission system south of Larrabee Road, including a parallel 345-kV line between the Coopers Mills Road Substation and the Maine Yankee Substation. The Independent System Operator New England (ISO-NE) has identified certain of these upgrades, including the new

[1] The HVDC transmission line would be entirely underground as it passes below the Upper Kennebec River using horizontal directional drill technology.
[2] The environmental review undertaken by the Maine Department of Environmental Protection, discussed in Section 1.3.4, included all 5 segments of the NECEC project.

Coopers Mills line, as necessary to the interconnection of new renewable generation in western and northern Maine.[3]

1.1 Presidential Permits

As required by 10 CFR 205.320(a), any entity "who operates an electric power transmission or distribution facility crossing the border of the United States, for the transmission of electric energy between the United States and a foreign country, shall have a Presidential permit, in compliance with EO 10485, as amended by EO 12038." EO 10485, as amended by EO 12038, directs the Secretary of Energy "[u]pon finding the issuance of the permit to be consistent with the public interest, and, after obtaining the favorable recommendations of the Secretary of State and the Secretary of Defense thereon, to issue to the applicant, as appropriate, a permit for [the] construction, operation, maintenance, or connection" of "facilities for the transmission of electric energy between the United States and a foreign country." DOE determines whether issuing a Presidential permit would be consistent with the public interest by assessing the effect of the Proposed Project on electric reliability and other factors that DOE considers to be relevant to the public interest, which have in the past included the environmental effects of the Proposed Project. The DOE Office of Electricity (OE) is responsible for reviewing Presidential permit applications and determining whether to grant a permit for electric transmission facilities that cross the United States' international border. If DOE issues a Presidential permit to NECEC LLC, it would authorize NECEC LLC to construct, operate, maintain, and connect the United States' portion of the Proposed Project where the project crosses the United States–Canada border.

1.2 Scope of DOE's Environmental Review

DOE's issuance of a Presidential permit to NECEC would be pursuant to authority delegated by the President under EO 10485, as amended by EO 12038, which provides that "the proper conduct of the foreign relations of the United States requires that executive permission be obtained for the construction and maintenance at the borders of the United States of facilities for the exportation or importation of electric energy and natural gas" (EO 10485 (preamble)). The authority delegated to DOE by the EO does not derive from any act of Congress, but arises "by virtue of the authority vested in [the President] as President of the United States and Commander in Chief of the armed forces of the United States" (Id (preamble)). Thus, in issuing a Presidential permit, DOE does not act pursuant to its congressionally established authority as a Federal agency, but on behalf of the President pursuant to a delegation of the President's authority under the United States Constitution.

It is settled and established law that the President is not an "agency" within the meaning of the Administrative Procedure Act (APA), given "the separation of powers and the unique constitutional position of the President" (*Franklin v. Massachusetts*, 505 U.S. 788, 800 (1992)). As a result, an action by the President is not subject to judicial review under the APA. Id at 796. Courts have applied these principles in finding that the issuance of a Presidential permit by a Federal agency is Presidential action and denying National Environmental Policy Act (NEPA) claims for judicial review of the permit. (*Dalton v. Specter*, 511 U.S. 462, 469-71 (1994); *Portland Audubon Soc'y v. Endangered Species Committee*, 984

[3] See *Central Maine Power Company Request for Approval of CPCN for the New England Clean Energy Connect Consisting of the Construction of a 1,200 MW HVDC Transmission Line from the Québec-Maine Border to Lewiston (NECEC) and Related Network Upgrades*, Order Granting Certificate of Public Convenience and Necessity and Approving Stipulation, Docket No. 2017-00232 at p. 74 & n. 38 (May 3, 2019) (available at https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2017-00232); *Elective Transmission Upgrade Interconnection System Impact Study For ISO New England (QP639)* at pp. 2, 71-74 (May 7, 2020) (may be requested at https://www.iso-ne.com/system-planning/system-plans-studies/interconnection-request-studies/?document-type=ME%20Queue%20Studies). See also U.S. Energy Information Administration, Maine: State Profile and Energy Estimates, July 16, 2020 (available at https://www.eia.gov/state/analysis.php?sid=ME).

F.2d 1534, 1547 (9th Cir. 1993); and, *Greene County. Planning Bd. v. Fed. Power Comm'n*, 528 F.2d 38 (2d Cir. 1975) (holding that issuance of a Presidential permit by DOE's predecessor agency was not subject to judicial review under the Federal Power Act because the issuance of such a permit is "a function rooted in the President's power with respect to foreign relations if not as Commander in Chief of the Armed Forces")).

DOE has conducted environmental reviews, consistent with NEPA, for Presidential permit applications to inform decision makers, concerned citizens, and other stakeholders. However, because Presidential actions are not subject to NEPA review, the Department could issue a Presidential permit without preparing an EA or Environmental Impact Statement (EIS), or could conduct an environmental review that does not strictly comply with all of the requirements of NEPA. Notwithstanding this discretion, DOE has decided to prepare this EA to inform the Department's public interest determination.

An important starting point for environmental analysis consistent with NEPA involves a determination of the appropriate scope of review. Prior to the recent changes in the Council on Environmental Quality (CEQ) NEPA regulations (40 CFR Parts 1500–1508), DOE would look at the proposed transmission line as a "connected action" from the proposed border crossing to the point of first interconnection with the electricity grid. These recent changes, however, direct DOE to alter this approach. Under CEQ's revised regulations, which became effective September 14, 2020, DOE's review of proposed actions is limited to consideration of effects that "are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives" (40 CFR 1508.1(g)). "A 'but for' causal relationship is insufficient to make an agency responsible for a particular effect under NEPA…Effects do not include those effects that the agency has no ability to prevent due to its limited statutory authority or would occur regardless of the proposed action" (40 CFR 1508.1(g)(2)).

All facilities described in the Presidential permit application are or would be located in Maine and have been approved by the Maine Public Utilities Commission (MPUC) (MPUC 2020). Except for the border crossing, DOE has no authority to approve, deny, or regulate these facilities and no ability to require the avoidance or minimization of related potential environmental impacts. Therefore, DOE need not include within the scope of its environmental review the length of the proposed line to the point of interconnection, as it has done in the past, and would satisfy the CEQ regulations by looking only at the border crossing. However, in this case, DOE has considered potential environmental effects of the project for the length of the line from the United States–Canada border to the point of first interconnection in Lewiston, Maine.

Similar considerations relate to provisions of DOE's Floodplain and Wetland Environmental Review Requirements (10 CFR part 1022). The Proposed Project would not cross wetlands on Federal land, and so 10 CFR part 1022 does not apply (10 CFR 1022.5(c)). Moreover, the Proposed Project does not involve a "floodplain action" or "wetland action" as defined in 10 CFR 1022.4. DOE analyzes potential floodplain and wetland impacts in Section 3.5.2.2 of this EA. Furthermore, DOE notes that the USACE and agencies of the State of Maine evaluated impacts on floodplains and wetlands and included mitigation conditions within their decisions.

1.3 Related Environmental Reviews

DOE incorporates by reference information from a related EA prepared by the U.S. Army Corps of Engineers (USACE) and documents prepared by the State of Maine, as part of its review and approval of the Proposed Project (USACE 2020a, MDEP 2020, MPUC 2020, Maine LUPC 2020). These Federal and state agencies evaluated environmental impacts of the Proposed Project within their respective areas of authority. In their decisions, the agencies included conditions to minimize, avoid, or compensate for adverse environmental impacts. None of the agencies found, with these conditions, a potential for

significant environmental impact. The mitigation conditions put in place by these agencies are binding on the Proposed Project and DOE includes them in its analysis as part of the proposed action. DOE lacks authority to enforce the mitigation conditions but has reviewed the conditions and finds them to be reasonable and appropriate.

The National Park Service (NPS) is reviewing the proposed relocation of the Appalachian National Scenic Trail (ANST) across NPS lands as outlined in the Section 106 Memorandum of Agreement (MOA) (USACE et al. 2020; USACE et al. 2021) (The MOA is discussed in Section 3.10, *Historic and Cultural Resources* and provided in Appendix G, *Historic and Cultural Resources*.). The MOA includes a treatment plan for the ANST to resolve adverse effects. This plan includes relocating several short sections of the ANST to reduce the number of times it would cross the Proposed Project corridor. Because this review is ongoing by the NPS, it is not further discussed in this EA.

1.3.1 Department of the Army Environmental Assessment and Statement of Findings for the Above-Referenced Standard Individual Permit Application [i.e., CENAE-RDC; NAE-2017-01342]" (July 7, 2020) and Environmental Assessment Addendum; Central Maine Power Company (CMP); New England Clean Energy Connect (NECEC); File No. NAE-2017-01342 (November 4, 2020).

Pursuant to its authority under Section 404 of the Clean Water Act (33 U.S. Code (U.S.C.) § 1344), and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403), the New England District of USACE proposed to authorize the discharge of fill material into waters of the U.S. and work under a navigable water of the United States associated with the Proposed Project. The scope of the USACE EA is "limited to the proposed impacts to waters of the U.S. and the immediately surrounding uplands to facilitate the regulated work. The regulated activities are a series of links of varying sizes within the transmission line corridors, at two of the eight stations, and at one [horizontal directional drill] termination station." The USACE EA considered "direct and indirect, permanent and temporary impacts to aquatic resources associated with construction and upgrade of transmission lines and the construction of substations or converter stations including impacts to freshwater wetlands." The USACE analysis included consideration of endangered species pursuant to Section 7 of the Endangered Species Act (ESA) and historic resources pursuant to Section 106 of the National Historic Preservation Act. DOE participated in both of these consultations and was a cooperating agency in the USACE EA. USACE concluded that the Proposed Project did not pose the potential for significant environmental impacts. The USACE permit includes both general and special conditions addressing specific actions necessary to ensure minimization of adverse project-related impacts (USACE 2020b).

USACE prepared an addendum to its EA that considered changes proposed by the applicant to the USACE special conditions. USACE made some changes and published the Revised Permit Special Conditions with its EA addendum. The Appalachian Mountain Club, the Natural Resources Council of Maine, and Sierra Club Maine have sued USACE, contesting the adequacy of its environmental review.[4]

On December 30, 2020, the applicant submitted a revision application to USACE and MDEP (Minor Revision of Department Order #L-27625-26- A-N, L-27625-TB-B-N, L-27625-2C-C-N, L-27625-VP-D-

[4] Complaint For Declaratory And Injunctive Relief, *Sierra Club et al. v. U.S. Army Corps of Eng'rs*, No. 2:20-cv-00396-LEW (D. Me. Oct. 27, 2020).

N, L-27625-IW-E-N; USACE Permit NAE-2017-01342), which are based on the based on the "Issued for Construction" design level (CMP 2020t). The responses that the applicant provided to DOE's most recent data requests are also based on this same "Issued for Construction" design level.

The revisions included in this application were summarized as: "renumbering of the HVDC transmission line from Section 3006 to Section 432; minor design changes associated with pole design and location refinements related to impact avoidance/minimization, observed setbacks and buffers, and municipal permitting requirements (e.g., moving poles out of resource protection districts and/or the shoreland zone); minor modifications to in-corridor temporary access roads associated with pole location refinements and off right-of-way (ROW) access points; minor re-route near Bowman Airfield in Livermore Falls; minor corridor expansion adjacent to a portion of Section 3007 in Lewiston; and, minor modifications to Merrill Road Converter Station and West Forks and Moxie Gore Termination Stations" (CMP 2020t). The application also consisted of some revisions and updates to various resource tables, maps, and plans.

1.3.2 Order Granting Certificate of Public Convenience and Necessity and Approving Stipulation, State of Maine, Public Utilities Commission (May 3, 2019)

MPUC issued an order granting a Certificate of Public Convenience and Necessity for the Project. The Commission found that the construction and operation of the Proposed Project is in the public interest. As required by Maine statute, in reaching this conclusion, the Commission considered the effects of the Proposed Project on economics; reliability; public health and safety; scenic, historic and recreational values; and state renewable energy goals (MPUC 2020).

1.3.3 Maine Land Use Planning Commission Final Development Plan Permit (January 8, 2020)

The Maine Land Use Planning Commission (LUPC) certified to the Maine Department of Environmental Protection (MDEP) (Site Law Certification SLC-9) that the Proposed Project is an allowed use within the subdistricts in which it is proposed and that the Proposed Project complies with all of the LUPC's applicable land use standards, those not considered in the MDEP's review (Maine LUPC 2020). The scope of LUPC's review is zoning subdistricts and use listings, land use standards, and the comprehensive land use plan. The LUPC certification, including its conditions, are incorporated into, and made part of, the MDEP Order (MDEP 2020) described below.

1.3.4 Maine Department of Environmental Protection Order (May 11, 2020)

MDEP approved, with conditions, CMP's applications for state land use permits for the Proposed Project after consideration of the following areas: noise, scenic character, existing uses, natural resource impacts, historic sites, buffer strips, soils, stormwater management, groundwater, water supply, wastewater disposal, solid waste, flooding, alteration of climate, and decommissioning requirements. The Order states, "The record of this proceeding demonstrates that the project will satisfy the Department's permitting standards subject to the conditions in this Order. Issuance of this Order follows a 29-month regulatory review, which included six days of evidentiary hearings and two nights of public testimony." (MDEP 2020).

As described above, on December 30, 2020, the applicant submitted a revision application to USACE and MDEP (Minor Revision of Department Order #L-27625-26- A-N, L-27625-TB-B-N, L-27625-2C-C-N, L-27625-VP-D-N, L-27625-IW-E-N; USACE Permit NAE-2017-01342). MDEP is accepting public comments on the revision application through January 18, 2021 (CMP 2020t).

1.4 Public Involvement

DOE provided a draft of this EA to the State of Maine for review consistent with 10 CFR 1021.301(d). MDEP responded in a letter dated December 23, 2020, that DOE's Draft EA "accurately summarizes the Department's permitting process, the resulting order approving the project, and the manner in which the project must be constructed to comply with the conditions of the Department's order…. Further, many of the resources and potential impacts to these resources considered in Chapter 3 of the Draft EA, are the same resources the Department is charged with protecting under Maine law and evaluated as part of its permitting review. Where this overlap exists, the Draft EA appears consistent with the Department's own assessment completed as part of the state environmental permitting process" (a copy of the letter is provided in Appendix K).

Previously, DOE provided an opportunity for public involvement upon receipt of the application for the Proposed Project.[5] Also, DOE participated in the USACE's NEPA process and reviewed public comments provided to USACE on its EA. DOE's Presidential permit authority was discussed in USACE's Public Notice dated March 26, 2019 regarding USACE's receipt of a permit application from the applicant (USACE 2019a). Similarly, DOE's Presidential permit authority was discussed in USACE's Public Notice dated November 1, 2019 for its public hearing on December 5, 2019 (USACE 2019b). DOE attended the USACE Public Hearing in Lewiston, Maine on December 5, 2019.

In its EA, USACE summarizes the public involvement opportunities for the Proposed Project:

> "In addition to the nearly 10-month period (March 26, 2019 through January 6, 2020 inclusive of the December 5, 2019 public hearing) in which the USACE was actively receiving public comments on the Project, the USACE notes that the public has had multiple other opportunities to participate in the Project review. The applicant held and/or participated in more than 250 public meetings allowing for public interaction concerning the Project. These include more than 120 meetings with officials and the public in towns and counties along the ROW and over 130 additional meetings and presentations with interested parties, organizations, associations, and environmental groups. There is an interactive Project website and social media forum, and the Project has been the subject of extensive media coverage throughout the state.
>
> "In the course of three state agency reviews (Maine PUC, LUPC, and Maine DEP) and two public legislative committee presentations, the Project was the subject of three pre-application Public Informational Meetings in Bingham, Lewiston, and Windsor; three public witness hearings before the Maine PUC in Farmington, The Forks Plantation, and Hallowell; a Maine PUC hearing open to the public; two public comment hearings before the Maine DEP and LUPC; six days of DEP hearings open to the public, which included three days of concurrent hearings before the LUPC that were open to the public; and multiple public debate forums at the county and municipal levels and in the media." (USACE 2020a).

[5] Notice of Application (82 Fed. Reg. 45,013 (Sept. 27, 2017)) inviting motions to intervene.

DOE also reviewed public comment provided to the State of Maine as part of reviews by the Public Utilities Commission, Land Use Planning Commission, and Department of Environmental Protection. MDEP summarized its public involvement process in its Order:

> "Issuance of this Order follows a 29-month regulatory review, which included six days of evidentiary hearings and two nights of public testimony. Twenty-two parties, consolidated into ten groups, participated in the evidentiary hearings by helping to shape the administrative review process, providing sworn testimony from dozens of witnesses, cross examining those witnesses, and submitting argument on the interpretation and application of relevant permitting criteria. Hundreds of Maine citizens testified during the public hearings and submitted written comment on the many issues the application presented. The hearing and public comment process provided the Department with critical information and analysis of the applicant's proposal, its impacts, whether and how those impacts can be mitigated, and the availability of alternatives." (MDEP 2020).

In addition to all the opportunities available for input from the public at large, additional opportunities for tribal involvement, and additional public involvement, were provided through the Section 106 process for compliance with the National Historic Preservation Act. DOE participated with USACE in this process. As described in the Section 106 MOA (USACE et al. 2020; USACE et al. 2021), the Aroostook Band of the Micmacs, Houlton Band of the Maliseet Indians, Passamaquoddy Tribe, and Penobscot Nation were invited to participate as consulting parties in accordance with 36 CFR Section 800.3(f)(2), and those tribes chose not to participate in consultation. The Penobscot Nation responded during the Section 106 process and, in a letter dated August 28, 2017, the tribe's Tribal Historic Preservation Officer made a no effect determination (Penobscot Nation 2017).

1.5 Cooperating Agency and Federal Consultations

To inform its public interest determination, DOE participated as a cooperating agency to USACE in accordance with 40 CFR 1501.6. DOE became a cooperating agency on February 8, 2018. USACE was the lead agency. DOE completed both the Section 106 and Section 7 consultations with USACE, and the agencies will continue to cooperate on those consultations as needed. DOE is a signatory to the MOA for the Section 106 consultation (USACE et al. 2020; USACE et al. 2021).

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Chapter 2
Proposed Action

2.1 Purpose and Need

The purpose of and need for DOE's action is to comply with EO 10485, as amended by EO 12038, and the regulations at 10 CFR 205.320 *et seq*., by determining whether to issue a Presidential permit for the Proposed Project.

2.2 NECEC Objectives

The NECEC project was proposed in response to the March 31, 2017 Request for Proposals for Long-Term Contracts for Clean Energy Projects (RFP)[6] issued by the Massachusetts Department of Energy Resources and the Electric Distribution Companies of Massachusetts (Massachusetts Clean Energy 2018).

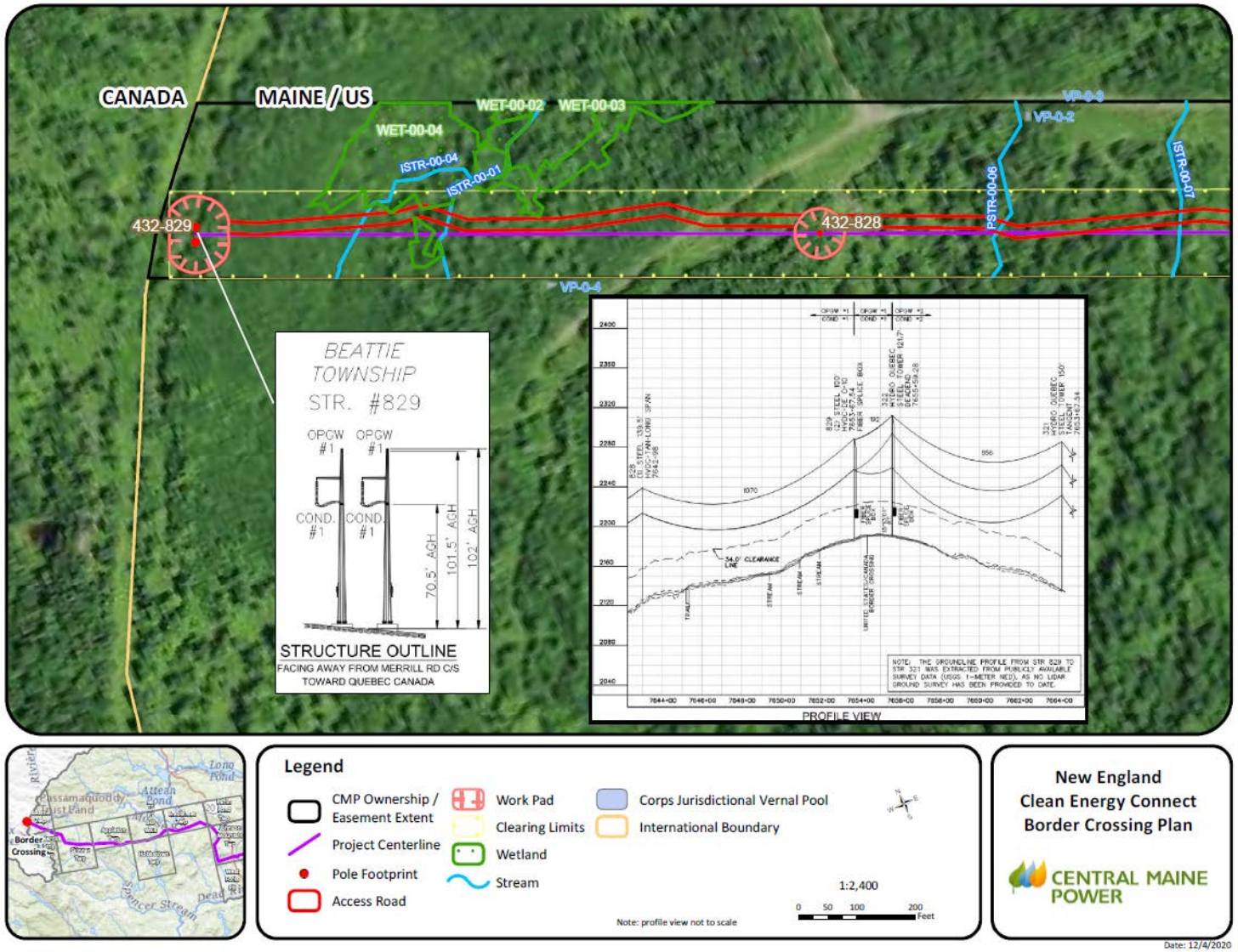
2.3 DOE's Proposed Action

DOE's proposed action is the decision regarding the issuance of a Presidential permit for the construction, operation, maintenance, and connection of the Proposed Project at the international border of the United States and Canada. If granted, there would be no expiration date for the Presidential permit.

DOE's preferred alternative is to grant a Presidential permit for the applicant's proposed international border crossing at Latitude 45° 30' 56.39" N, Longitude 70° 43' 15.48" W in Beattie Township, Maine.

The proposed international border crossing is illustrated in Figure 2.3-1, Border Crossing Plan.

[6] The Massachusetts RFP sought proposals for long-term contracts for annual deliveries of up to 8,500,000 MWh of Clean Energy Generation and related transmission starting no later than 2022, pursuant to Section 83D of Chapter 169 of the Acts of 2008 (the "Massachusetts Green Communities Act"), as amended by Chapter 188 of the Acts of 2016, An Act to Promote Energy Diversity (the "Massachusetts Energy Diversity Act").



Source: CMP, December 2020.

Figure 2.3-1. Border Crossing Plan

2.4 Proposed Project

The Proposed Project is an HVDC transmission line and related facilities capable of delivering up to 1,200 MW of Clean Energy Generation[7] from the Canadian border to the New England Control Area.[8] All U.S. facilities described in the Presidential permit application are or would be located in Maine. The project would cross the Québec-Maine border in the northwest corner of Beattie Township at Latitude 45° 30' 56.39" N, Longitude 70° 43' 15.48" W. The Québec portion of the NECEC project would be constructed, owned, and operated by Hydro-Québec TransEnergie, Inc (HQT), an affiliate of Hydro Québec. HQT is not affiliated with CMP or NECEC LLC.

The facilities proposed to be developed by NECEC LLC are: (1) the segment from the Québec-Maine border up to and including the first transmission line pole in Maine; (2) approximately 145 miles of +/- 320 kV mostly[9] overhead HVDC transmission line from the proposed border crossing to an interconnection point in Lewiston, Maine; (3) a new +/-320-kV DC to 345-kV AC 1,200 MW converter station at near Merrill Road in Lewiston, Maine (referred to as the Merrill Road Converter Station), which would convert the electrical power from DC to AC; (4) a 1.2-mile, above-ground 345-kV AC transmission line from the proposed Merrill Road Converter Station to the existing Larrabee Road Substation; and (5) a 345-kV line terminal at the Larrabee Road Substation. Section 1.3 of the USACE EA provides additional description of the Proposed Project, and Appendix A of that EA includes project overview maps (USACE 2020a).

This EA analyzes potential environmental impacts associated with Segments 1 through 3, that is, up to the Larrabee Road Substation and interconnection with the electricity grid. Segments 4 and 5 are not part of the scope of this EA.

2.4.1 Transmission Lines

Segment 1 would begin at the Québec-Maine border in Beattie Township and continue within a 300-foot-wide right of way (ROW), with the exception of the 1 mile portion of ROW that traverses Merrill Strip Township that would be 150 feet in width, to The Forks Plantation. The ROW obtained by CMP for the Merrill Strip Alternative is 150-feet wide. The remainder of the ROW within Segment 1 is 300-feet wide. Segment 1 is an approximately 53.1-mile-long, 320-kV DC transmission line. The applicant proposes to use the southernmost 150 feet of the ROW for the Segment 1 corridor (MDEP 2020). Segment 1 also would include a horizontal directional drill crossing beneath the Kennebec River. There are four types of vegetation management required in the Segment 1 corridor, described in Appendix C to the MDEP Order: (a) full canopy height vegetation; (b) vegetation with a 35-foot minimum height; (c) deer travel corridors; and (d) tapered vegetation. The Appendix also describes riparian filter areas adjacent to rivers, streams, and brooks (MDEP 2020).

Segment 2 would extend from The Forks Plantation to the Wyman Substation in Moscow and would be a 21.9-mile-long, 320-kV DC transmission line. The applicant proposes to co-locate Segment 2 with the existing transmission line that runs from Harris Dam to the Wyman Substation. The corridor within the

[7] The Massachusetts RFP defines "Clean Energy Generation" as "(i) firm service hydroelectric generation from hydroelectric generation alone; (ii) new Class I Renewable Portfolio Standard ("RPS") eligible resources that are firmed up with firm service hydroelectric generation; or (iii) new Class I RPS eligible resources."

[8] The New England Control Area includes the transmission system administered by ISO-NE, the regional transmission organization, located in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, but does not include the transmission system in northern Maine (i.e., Aroostook County and parts of Penobscot and Washington counties).

[9] The HVDC transmission line would be entirely underground as it passes below the Upper Kennebec River using Horizontal Directional Drill technology.

existing utility ROW would be widened by an average of 75 feet to accommodate co-location of the proposed transmission line.

Segment 3 would extend from the Wyman Substation in Moscow to the proposed Merrill Road Converter Station in Lewiston. This segment would be 71.1 miles long and co-located with transmission lines in an existing ROW. This segment also would include the rebuilding of 0.8 mile of 34.5-kV AC transmission line outside the Larrabee Road Substation and constructing 1.2 miles of new 345-kV AC transmission line from the proposed Merrill Road Converter Station to the Larrabee Road Substation (as well as various structure replacements to make room for the transmission lines and installation of the driveway to the Merrill Road Converter Station). The utilized portion of the ROW would be widened by an average of 75 feet.

2.4.2 Substations

The proposed Merrill Road Converter Station would convert DC electricity from Canada to AC electricity to be fed into the United States grid. The proposed Converter Station would be located immediately adjacent to the transmission corridor, and with the access road, would occupy 13.4 acres of the site.

The Larrabee Road Substation upgrades would include the addition of a 345-kV line termination structure, a 345-kV circuit breaker, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundation modifications to the existing protection and control system, and network upgrades. The Larrabee Road Substation currently occupies 15.44 acres. These upgrades would result in 0.08 acres of new impervious area (MDEP 2020).

2.5 No Action Alternative

The No Action Alternative establishes the baseline against which the potential environmental effects of the proposed action can be evaluated. Under the No Action Alternative, DOE would not issue a Presidential permit to NECEC LLC for the Proposed Project. Consequently, the transmission system would not be authorized to cross the United States–Canada border. DOE assumes that it would be unlikely that the Proposed Project would be constructed as proposed, and the potential environmental impacts associated with the Proposed Project would not occur.

If the No Action Alternative results in the project not being constructed, the applicant would not meet its objectives to deliver “Clean Energy Generation” to the New England Control Area. The other benefits of the Proposed Project—enhanced electric reliability, particularly in winter months when natural gas supply and transfer constraints have occurred in recent years; reduced wholesale cost of electricity; and greenhouse gas emissions reductions—also would not be realized under the No Action Alternative.

The environmental consequences of the No Action Alternative are discussed in Chapter 3, *Affected Environment and Environmental Consequences*, below. See also the USACE EA Section 5.2.1.

2.6 Alternatives Considered but Eliminated from Detailed Discussion

DOE, as a cooperating agency to USACE, considered the range of alternatives discussed in Section 4 of the Presidential permit application, in the USACE EA, and in documents issued by the State of Maine as part of its review of the Proposed Project (USACE 2020a, MDEP 2020, MPUC 2020, Maine LUPC 2020). These alternatives included alternative design and construction methods (i.e., underground installation), overhead route alternatives, alternatives considering co-location with existing transportation

routes and/or electric distribution corridors, and hybrid combinations of each. The converter station and substation sites were evaluated and compared to both on-site and off-site alternatives. Additionally, alternatives associated with distinct portions of the proposed action, including the proposed international border crossing, crossings of Outstanding River Segments (as identified in 38 M.R.S. § 480-P and 12 M.R.S § 403), and crossings of zoning subdistricts requiring special exception and certification approval by the LUPC were evaluated.

2.7 Issues Out of Scope – Impacts in Canada

NEPA does not require an analysis of potential environmental impacts that occur solely within another sovereign nation with its own environmental statutes and regulations that result from actions approved by that sovereign nation. For that reason, this EA does not address potential environmental effects in Canada.

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Chapter 3
Affected Environment and Environmental Consequences

3.1 Introduction

Chapter 3 discusses the existing environmental conditions of the analysis areas for the Proposed Project, as well as the environmental consequences from developing the Proposed Project as defined in Chapter 2 *Proposed Action.* The resources considered in the analysis are listed in Section 3.1.1, Table 3.1-1, below. The analysis area for each of the resources is described in Section 3.1.2, *Analysis Area*, and carried into the analysis in Sections 3.2, *Geology and Soils*, through Section 3.15, *Hazardous Materials and Waste.* Cumulative impacts are described separately in Section 3.16, *Cumulative Impacts*.

3.1.1 Resources Considered in this Analysis

The following resources are analyzed in this chapter (summarized in Table 3.1-1).

Table 3.1-1. Resources Considered for Detailed Analysis in this EA

Resource	Section of Chapter 3 (where analyzed)
Geology and Soils	Section 3.2
Vegetation	Section 3.3
Wildlife	Section 3.4
Water Resources and Quality	Section 3.5
Land Use and Recreation	Section 3.6
Visual Resources	Section 3.7
Socioeconomics	Section 3.8
Environmental Justice	Section 3.9
Historic and Cultural Resources	Section 3.10
Air Quality and Climate Change	Section 3.11
Noise	Section 3.12
Infrastructure	Section 3.13
Human Health and Safety	Section 3.14
Hazardous Materials and Waste	Section 3.15

3.1.2 Analysis Area

The analysis area for each resource is described below in Table 3.1-2. Analysis areas were established to provide a broad enough geographic context within which the impacts of the Proposed Project can be described and assessed. The analysis area for each resource topic applies to the extent of Segments 1, 2, and 3 of the transmission line corridor, as well as the proposed new Merrill Road Converter Station and extended area of the Larrabee Road Substation (both referred to herein as *substations*). No changes are proposed at the Wyman Substation. Refer to Chapter 2 for detailed descriptions of these project elements. The analysis area for the EA is limited to the United States.

Table 3.1-2. Analysis Area by Resource

Resource	Analysis Area[1]
Geology and Soils	0.5-mile from transmission centerline and edge of substations. Geological hazards: 25-miles from transmission centerline and edge of substations
Vegetation	0.5-mile from transmission centerline and edge of substations. Sensitive Plants and Rare Natural Communities: 300-foot wide transmission line corridor.
Wildlife	0.5-mile from transmission centerline and edge of substations. Sensitive Habitat Areas: 300-foot wide transmission line corridor.
Water Resources and Quality	500-foot wide corridor along Segment 1, a 300 to 400-foot wide corridor along Segments 2 and 3 (depending on width of existing ROW), and the locations of the converter station and substation.
Land Use and Recreation	Transmission Line ROW and substation footprints for Land Use and Recreation (refer to Visual Resources for visual impacts to recreation resources and to Historic Resources for analysis area for National Historic Trails (e.g., ANST).
Visual Resources	Three miles from the transmission centerline and substations and up to 5 miles from the transmission centerline and substations for elevated viewpoints within the viewshed
Socioeconomics	Androscoggin, Franklin, and Somerset counties
Environmental Justice	14 Census Tracts in the three counties: Androscoggin County (Census Tracts 209, 440, 450, and 460), Franklin County (Census Tracts 9701.02, 9710, 9711, 9712, 9713, and 9714), and Somerset County (Census Tracts 9653.02, 9663, 9664, and 9670)
Historic and Cultural Resources	Area of Potential Effect (APE) is defined as 0.5-mile from transmission centerline and 0.5-mile from edge of substations
Air Quality and Climate Change	Air Quality – Local Effects: 1,000 feet from transmission line centerline and from edge of fixed facility (e.g., substation) Air Quality – Regional Effects: MDEP Southern, Central, and Eastern Maine Regions Climate: Global
Noise	0.5-mile from transmission line centerline and from edge of substations/fixed facilities
Infrastructure	1-mile from transmission centerline and from edge of substations
Human Health and Safety	1,000-feet from transmission centerline and from edge of substations
Hazardous Materials and Waste	1,000-feet from transmission centerline and from edge of substations

Edge of substations = Edge of 13.4-acre footprint of proposed new Merrill Road Converter Station and edge of extended 0.08-acre footprint of the existing Larrabee Road Substation.

3.1.2.1 Permanent and Temporary Impacts

For purposes of the analysis of environmental consequences, quantified and qualitative impacts have been projected based on the analysis area defined above. Further clarification is provided below defining permanent and temporary impacts.

Permanent Impacts

- Disturbance during operation and maintenance could come from any number of activities, such as overland access for inspection and repairs, maintenance of roads in the ROW, and vegetation management activities. Permanent impacts could also occur as a result of mitigation, including beneficial impacts.

- Calculations assume that the structure locations within the ROW would result in long-term disturbance during operation and maintenance for the life of the Proposed Project.

- Approximately 13.4 acres for the proposed new Merrill Road Converter Station footprint would result in permanent disturbance (MDEP 2020: Page 100).

- Approximately 0.08 acre of additional permanent footprint would result from the expanded Larrabee Road Substation (MDEP 2020: Page 7).

Temporary Impacts

- Temporary disturbance during construction could come from any number of activities, such as overland access, construction of upgraded or new temporary access roads, structure work areas, pulling stations, laydown areas, vegetation clearing, etc., as well as in areas that the applicant implements post-construction remediation and restoration.

- Temporary impacts also include short-term effects to air quality and noise resulting from construction and operational/maintenance equipment and activities (e.g., fugitive dust, helicopter and vehicle noise).

3.2 Geology and Soils

3.2.1 Affected Environment

The analysis area for geology and soils is a 0.5-mile buffer surrounding the centerline of the ROW and edges of substations; the analysis area for geological hazards is 25-miles from the transmission centerline and from the edges of substations. The analysis area falls within the New England physiographic province of the Appalachian Highlands (USGS 2000). This province is characterized by highly deformed Precambrian and Paleozoic metamorphic rocks including gneisses, schists, slates, quartzite, and marble. The New England physiographic province is a mountainous area of significant relief in the White Mountains exhibiting the highest elevations at 6,288 feet above mean sea level (NPS 2018). Elevation within the analysis area ranges from approximately 1,900 feet to 2,700 feet above mean sea level.

3.2.1.1 Geology

The surficial geology of the analysis area is covered by glacial till, which is derived from the erosion and entrainment of material by the moving ice of a glacier (Maine Geological Survey 2003). Surficial materials in Maine are relatively thin, generally less than 50 feet, and rarely over 100 feet. Maine's bedrock geology comprises a vast array of rock types, some common and some rare, each with variations in mineral content, color, texture, and structure (Maine Geological Survey 2003). In total, the analysis area contains 26 geologic bedrock units as described in Table 3.2-1.

Table 3.2-1. Geology of the Analysis Area

Geologic Type	Description
Cambrian Hurricane Mountain Formation	Consists of dark, rusty-weathering, siliceous, scaly slate or schist, with flaser structure and polymict fragments ranging in size from a few millimeters up to several hundred meters. Considered a melange consisting of metasedimentary, felsic and mafic metavolcanic, and ultramafic rocks. Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Protolith - Melange
Carboniferous syenite	Unmetamorphosed coarse-grained igneous rock.

Geologic Type	Description
Cambian Jim Pond Formation, quatzwake and pelite	Volcanic and metasedimentary rocks of the ophiolite sequence in central-western Maine are named the Jim Pond Formation. It consists of a basal chlorite-albite-epidote-actinolite greenstone member with minor metagraywacke, 500 to 1,600 feet thick. Northwest of the Squirtgun fault it is divided into lower and upper units by a metadacite member in the east, 0 to greater than 1,600 feet thick, and a metagraywacke member in the west. The metadacite member is closely associated with hematitic chert iron-formation members. Greenstone is thickly layered with pillowed and massive flows. Patches of altered amphibolite are in contact with the southeastern belt of tonalite of the Boil Mountain Complex (Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Protolith - Lithic sandstone.
Devonian Carrabassett Formation	Greenschist facies; Protolith - interbedded pelite, sandstone, and limestone and/or dolostone.
Devonian Carrabassett Formation, massive pelite member	Type locality designated as along east bank of south branch of Presque Isle Brook. Consists mainly of thick-bedded sandstones with some shaly layers. Thickness exceeds 500 feet. Fauna correlate closely with Lower Oriskany of New York as recognized at Becraft and indicates that Chapman is older than Mapleton and Moose River sandstones and younger than Square Lake limestone.
Devonian gabbro	Unmetamorphosed coarse-grained igneous rock.
Devonian granite (muscovite accessory mineral)	Muscovite-biotite granite undivided
Devonian Hildreths Formation	Greenschist facies, protolith – mafic to felsic volcanic rocks.
Devonian Seboomook Formation Day Mountain member	Named as a member of the Seboomook formation after Camera Hill, southwest part of Spencer Lake 15-min quad, Somerset County. Type section is on Camera Hill. Consists of dark-green, gray- to rusty-brown-weathering felsite with scattered feldspar phenocrysts and some vesicles near the base. Thickness ranges from 0 to 400 ft. Member occurs as discrete, probably conformable bodies within the Seboomook formation; contacts were not observed. Age is Devonian (Oriskany) because it lies above faunule of Oriskany age in the Seboomook formation.
Devonian Seboomook Formation Temple Stream member	Occurs in central Maine trough in western ME and consists of cyclically interbedded pelitic schist and graded metasiltstone and metasandstone. Similar to Day Mountain and Carrabassett Formations, also of Seboomook Group, but contains smaller proportion of arenaceous rocks than Day Mountain and a larger proportion than Carrabassett. In areas of migmatitic gneiss, lower part may contain abundant remnants of underlying Hildreths Formation of Seboomook Group.
Devonian - Silurian Madrid Formation	Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Protolith - Interbedded pelite, sandstone, and limestone and/or dolostone.
Devonian Tarratine Formation	Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Protolith - Basaltic volcanic rocks.
Devonian Tarratine Formation Misery Quartzite	Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Protolith - Pelite
Devonian unnamed garnet rhyolite	Greenschist facies; Protolith - limestone and/or dolostone.
Ordovician - Cambrian Dead River Formation, upper member	Dead River Formation of Bronson Hill-Boundary Mountains anticlinorium was previously mapped as Albee Formation in Cupsuptic 15-min quadrangle and in Oquossoc 15-min quadrangle in Maine and in wide areas of northern New Hampshire. In Cupsuptic quadrangle, consists of a main body of thinly interbedded greenish-gray slate and typically subordinate quartzite or feldspathic quartzite. Unit is also divided into three parts not shown on this map--a main body, a green slate and phyllite member, and a red, maroon, and purplish-gray slate member. A quartzite-rich member is mapped separately in Kennebago Lake 15-min quadrangle. An unnamed quartzite and phyllite member in Percy, New Hampshire is mapped separately and consists of quartzite and grit interbedded with phyllite; possibly a volcaniclastic facies of Perry Mountain Formation. Dead River Formation is undated but is assigned a Late Cambrian and Ordovician (Whiterockian) age based on position below Ordovician (Whiterockian and Mohawkian) Ammonoosuc Volcanics and above Cambrian Hurricane Mountain Formation. Medium rank amphibolite facies; Epidote-amphibolite facies; Protolith- Interbedded pelite and sandstone.

Geologic Type	Description
Ordovician quartz monzonite (hornblende accessory mineral)	Unmetamorphosed biotite-muscovite-quartz monzonite
Precambrian gneisses of the Chain Lakes Massif	Islesboro Formation is of Late Proterozoic age. Consists of interbedded pelite, siltstone and sandstone, limestone and dolomite, conglomerate, rhyolite, and basalt.
Silurian Sangerville Formation	In western sequence of central Maine trough, divided into a main body, lower member near Woodstock (schist and granofels probably equivalent to member B), upper member near Woodstock (schist and granofels probably equivalent to member C), member A (in turn divided into gray shale and massive sandstone facies, massive sandstone facies, and polymict conglomerate facies), member B (in turn divided into quartz-rich, polymictic conglomerate facies and gray shale and sandstone facies), and member C (in turn divided into quartz conglomerate, sandstone, and gray shale; impure limestone and quartz conglomerate lenses; and upper gray shale and sandstone).
Silurian Sangerville Formation, Anasagunticook member	In western sequence of central Maine trough, divided into a main body, lower member near Woodstock (schist and granofels probably equivalent to member B), upper member near Woodstock (schist and granofels probably equivalent to member C), member A (in turn divided into gray shale and massive sandstone facies, massive sandstone facies, and polymict conglomerate facies), member B (in turn divided into quartz-rich, polymictic conglomerate facies and gray shale and sandstone facies), and member C (in turn divided into quartz conglomerate, sandstone, and gray shale; impure limestone and quartz conglomerate lenses; and upper gray shale and sandstone).
Silurian Sangerville Formation, limestone member	Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Protolith - Rhyolitic volcanic rocks
Silurian Sangerville Formation, Patch Mountain member (417 to 443 million years ago (Ma)	In central Maine trough, Sangerville Formation is mapped as principal sandstone and shale facies, and subdivided into (ascending) Patch Mountain Limestone Member (name revised from Patch Mountain Member to emphasize lithology), consisting of thinly interbedded impure marble, coarsely crystallized calc-silicate rocks, granofels, and pelitic schist (high metamorphic grade), or thinly interbedded, gray micritic metalimestone, limy metasandstone, metasiltstone, and slate or pelitic schist (low metamorphic grade); a conglomerate member; euxinic shale lenses.
Silurian Sangerville Formation, sulfidic pelite member	Consists of well-bedded metasandstone, thinly laminated metasiltstone, and metashale. Thin medial unit of metalimestone. Gradationally overlies Patch Mountain Member of Sangerville Formation.
Silurian Smalls Falls Formation	Named the Penobscot formation for Penobscot Bay, central-south ME. Consists of metamorphosed shaly sediments (slates, schists, quartzites) typically developed along nearly whole length of western shore of Penobscot Bay. Color varies from light gray through steel gray and purplish gray to black, the darker grays being predominant. Locally injected and metamorphosed by granite and diorite. Weathered surfaces usually rusty. In a few places only the rock exhibits a very perfect slaty cleavage, highly inclined to bedding planes. Conformably overlies Battie quartzite.
Silurian The Forks Formation	In central Maine trough, Sangerville Formation is mapped as principal sandstone and shale facies, and subdivided into (ascending) Patch Mountain Limestone Member (name revised from Patch Mountain Member to emphasize lithology), consisting of thinly interbedded impure marble, coarsely crystallized calc-silicate rocks, granofels, and pelitic schist (high metamorphic grade), or thinly interbedded, gray micritic metalimestone, limy metasandstone, metasiltstone, and slate or pelitic schist (low metamorphic grade); a conglomerate member; euxinic shale lenses; Taylor Pond Member of Hussey consisting of feldspathic biotite- and hornblende-biotite granofels, thinly bedded calc-silicate rocks, and sparse garnet-rich laminations (coticule); an unnamed limestone member similar to Patch Mountain Limestone Member but at a higher stratigraphic level; and Thorncrag Hill Member of Hussey consisting of migmatitic pelitic gneiss and some calc-silicate rocks.
Silurian unnamed limestone	Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Protolith - Interbedded pelite and limestone and/or dolostone.

Geologic Type	Description
Silurian unnamed mafic volcanic rocks	Occurs in Little Bigelow Mountain and Pierce Pond 15-min quads, ME. Divided into unmapped upper member of thickly bedded, slightly calcareous, feldspathic metasandstone and a lower member of thinly bedded calcareous metasandstone, metasiltstone, impure metalimestone, and thin basal metaconglomerate. Includes rocks previously mapped as unnamed calcareous phyllite and related rocks in the Little Bigelow Mountain quadrangle. Contains shelly fossils in basal layer, but no diagnostic forms identified. Considered to be coeval with Late Silurian Madrid Formation on basis of lithologic similarity and conformable position of both formations below the Carrabassett Formation of the Seboomook Group. The Forks Formation also unconformably overlies pre-Silurian rocks and is probably a shoreline facies of the Madrid. Weakly metamorphosed; contains local occurrences of prehnite and pumpellyite; Greenschist facies; Epidote-amphibolite facies; Protolith - Argillaceous limestone and/or dolostone

Source: USGS 2017

Significant mineral resources occur throughout Maine, including crystalline rocks containing the ores of copper, zinc, lead, nickel, molybdenum, tin, tungsten, cobalt, beryllium, uranium, manganese, iron, gold, and silver. Nonmetallic commodities in the State include large reserves of high-quality fuel grade and agricultural peat, and pegmatite rocks known to yield rare and exotic mineral species, including semiprecious gems (Lepage et al. 1990). Gravel pits and granite quarries are also found throughout the State (Maine Geological Survey 2019). According to review of the Maine Mineral Resources Data System, no significant mineral commodities, metal deposits, metal mines, pegmatite quarries, or stone quarries occur within the analysis area (Maine Geological Survey 2019).

3.2.1.2 Hazards

Geologic hazards are natural physical conditions that, when present, can result in damage to land and structures or injury to people. Potential geologic hazards in the analysis area were determined through database searches, literature reviews, and topographic map reviews. Potential geologic hazards that could occur within the study include earthquakes and inland landslides. Overall, the analysis area is at relatively low risk for geologic hazards, discussed in more detail in the subsections below.

Earthquakes

Earthquakes in Maine are caused by modern stress being released occasionally along zones of weakness in the earth's crust (Maine Geological Survey 2005). No significant amount of motion has been shown for any fault in the State since the last Ice Age, about 20,000 years ago, and geologic evidence demonstrates that many faults have been inactive since the formation of the Appalachians, over 300 million years ago (Maine Geological Survey 2005). No earthquakes in Maine have caused significant damage; most are of small magnitude, and many are too small to feel (Maine Geological Survey 2005). No active faults or seismic hazard areas have been documented in the analysis area (USGS 2020).

Inland Landslides

Landslides are a known hazard in Maine, especially in southern Maine where events have been documented from the late Ice Age (about 14,000 years ago) to modern times (Spigel 2020). Generally, any steep slope is susceptible to slumping or landslides under the right conditions. Inland landslides in Maine are most likely to occur along river corridors or in areas with unconsolidated surficial materials (especially the Presumpscot Formation) (Spigel 2020). Review of the Maine Geological Survey inland landslide dataset revealed one known landslide within the analysis area: a 10.7 acre site on the east bank of the Androscoggin River at Turtle Island, approximately 2.9 miles south of the town of East Livermore in Androscoggin County (Maine Geological Survey 2020a). Landslide susceptibility maps have not been published by the Maine Geological Survey for the extent of the analysis area. However, portions of the

analysis area underlain by clay and/or along or adjacent to steep slopes may be susceptible to landslides during significant precipitation events.

3.2.1.3 Soils

The Soil Survey Geographic Database (SSURGO) compiled by the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), hardcopies of published USDA-NRCS county soil surveys, and the Official Series Description (OSD) website of the USDA-NRCS were utilized as the basis for the soils analysis within the Proposed Project transmission line corridor (NRCS 2020a, NRCS 2020b). To identify and map soils, Geographic Information Systems (GIS) software was used to complete an overlay analysis of the georeferenced SSURGO data within the analysis area, defined as a 0.5-mile buffer of the proposed transmission line centerline. In total, 189 soil types occur in the analysis area. Characteristics of the USDA-NRCS mapped soils were analyzed, and summary descriptions of all soils in the analysis area are provided in Appendix A, Geology and Soils. NRCS administers the Farmland Protection Policy Act of 1981 (7 U.S.C. Chapter 73 §§ 4201–4209). Certain soil types are considered prime farmland, unique farmland, and land of statewide or local importance and are protected under the Act. There are 45 soil types classified as prime farmland or farmland of statewide importance within the analysis area (see Appendix A, Table A-1). Mapped hydric soils include Biddeford, Brayton, Bucksport, Charles, Leicester, Limerick, Mixed Alluvial Land, Monarda, Naumberg, Pillsbury, Roundabout, Scantic, Scarboro, Swanton, Swanville, Walpole, and Whately series. The Peat and Muck map unit is also hydric and found within the proposed corridor. Refer to Appendix A for additional descriptions of these soil types and their location within the analysis area. On-site wetland delineations have been completed within the Proposed Project corridor, and the resultant wetland delineation maps provide a more accurate and detailed depiction of wetland boundaries than can be estimated from SSURGO hydric soil mapping. Refer to Section 3.5, *Water Resources and Quality*, for additional information on wetlands.

3.2.2 Environmental Consequences

3.2.2.1 Impact Analysis Area and Indicators

The impact analysis area for geology and soil resources is a 0.5-mile buffer from the transmission centerline and the edges of substations. The analysis area for geological hazards is 25 miles from the proposed transmission line centerline and from the edges of substations.

The following indicators were considered when analyzing impacts on geology and soils:

- Geology
    - Removal or physical disturbance of important geological resources in the analysis area
    - Inhibiting access to mineral resources in the analysis area
    - Increase in potential for geological hazards if the Proposed Project were to be constructed
- Soils
    - Disturbance of sensitive soils, such as prime farmland or farmland of statewide importance

- Loss of topsoil due to construction, operation, and/or maintenance activities (i.e., removal or mixing of topsoil)
- Soil compaction from vehicular traffic
- Soil erosion due to water and wind

3.2.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Common Impacts Across all Segments of the Proposed Project

Many of the impacts on geology and soils are common to all segments of the Proposed Project. Calculations assume that the full ROW would be used and disturbed during construction, as well as during operations and maintenance. A discussion of those impacts follows.

Geology

Although the analysis area for the affected environment is rich in ores, nonmetallic commodities, gravel pits, and granite quarries, none of these resources would be within the footprint of, or immediately adjacent to, the Proposed Project. There would be no impacts on important geologic resources. Additionally, no impacts on mineral resources in terms of access would be anticipated.

In terms of geologic hazards, the nearest known inland landslide area is located within the analysis area on the east bank of the Androscoggin River at Turtle Island, approximately 2.9 miles south of the town of East Livermore in Androscoggin County (Maine Geological Survey 2020a). Potential for slope failure, slumping, and landslides is considered low-to moderate; however, the Proposed Project has been sited to best conform to existing topographic features and is co-located withing an existing ROW for 93 miles. Neither the proposed transmission line ROW construction or expansion, nor new substation development or expansion, would permanently modify natural contours or drainage ways in such a way that natural drainage patterns would be changed. Pole butts or companion poles would be installed to provide additional structural support in areas where unconsolidated soils (e.g., peat and mucky soils) exist. Additionally, guy wires with anchors may be installed around structures to provide additional support. The risk of seismic activity is negligible, given the area's history and absence of active faults. In summary, no increase in the potential for geologic hazards would be anticipated.

Soils

In terms of soils within the impact analysis area, construction of the Proposed Project would result in short-term impacts on soils in the proposed new and expanded ROW, at the proposed new and expanded substation construction sites, and along upgraded or new access road. Other short-term impacts on soils during construction of the Proposed Project would include surface disturbance associated with tree cutting, site clearing, grading, excavation at structure locations, pulling and tensioning sites, setup areas, and as a result of equipment travel. Soil erosion could occur following vegetation removal if not properly stabilized or if revegetation is inadequate following restoration, especially on fine textured soils that occur

on sloping topography. Impacts on soil resources could include colonization of noxious weeds on disturbed soils, which could occur anywhere that soil would be disturbed. Weeds could outcompete native species due to their ability to thrive under conditions with low soil moisture content, poor nutrient availability, and coarse soil textures. The soil surface would be disturbed and sometimes compacted by heavy equipment traffic in the ROW and on access roads, during construction at substations, and side casting of transmission structure foundation spoil material. When soils are disturbed, they would be more susceptible to wind and water erosion. Clearing vegetation in the ROW and during access road construction (where necessary) would decrease vegetation cover and increase the potential for erosion.

Long-term impacts on soils within the impact analysis area would be caused by the placement of transmission line structures, foundations, and other permanent structures at the substation sites. Soil would be permanently displaced for structure foundations of the transmission line. According to the Maine Site Law Certification, permanent new access roads are not expected to be built for the construction of the Proposed Project (Maine LUPC 2020).

Typically, the installation of transmission line structures requires the embedded depth to be 10 percent of the pole length plus 2 feet for wood structures, which is easily supported by nearly all soil types across the Proposed Project area, and 20 percent +/- of structure length for steel structures. In some instances where unconsolidated soils (e.g., peat and mucky soils) exist, additional methods of structural support may be required. Generally, in these instances pole butts or companion poles are installed below ground and immediately adjacent to the pole to be installed and are then bolted to the pole. Additionally, guy wires with anchors may be installed around structures to provide additional support. The excavated soil would be sidecast (placed beside the excavation area) around the new pole foundations in a manner that would not change the existing topography and drainage (e.g., graded to match the existing topography).

Increased soil compaction would occur as a result of heavy construction equipment needed to install the transmission line structures and build the substations. Soils in the ROW and along new access roads would also be affected by grading for access and overland travel within the ROW.

Table 3.2-2 summarizes impacts on soils from surface disturbing activities associated with the Proposed Project. A total of 189 soil types covering approximately 94,421.3 acres constitute the analysis area; approximately 16,956.9 acres (18percent) of which are classified as hydric, whereas 12,829.0 acres (14 percent) are classified as prime farmlands or farmlands of statewide importance. Construction activities would disturb approximately 407.5 acres across all soil types occurring in the analysis area; 19.0 acres of which would be permanently disturbed to accommodate operation of the Proposed Project. Short-term surface disturbing impacts from construction would occur on approximately 56.0 acres of hydric soils and approximately 63.0 acres of soils classified as prime farmland or farmland of statewide importance (less than 0.1 percent and 0.1 percent of the analysis area, respectively). Permanent surface disturbing impacts from construction would occur on 0.2 acre of hydric soil types and 0.3 acre of soils classified as farmland or farmland of statewide importance. Refer to Appendix A for additional details on temporary and permanent impacts by individual soil type that would result from the Proposed Project.

Table 3.2-2. Proposed Project Soils Impact Summary

Soil Classification	Acres within Analysis Area	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)
Hydric Soils	16,956.9	56.0	0.2	56.2
Prime Farmlands or Farmlands of Statewide Importance	12,829.0	63.0	0.3	63.3
All soil types	94,421.3	407.5	19.0	426.5

Sources: CMP 2020a; NRCS 2020a; NRCS 2020b.

3.2.2.3 Applicant Committed Measures

When the following proposed measures are incorporated into the construction, operation, and maintenance of the Proposed Project, impacts on soils would be minimized.

Soil disturbance associated with construction activities would be minimized and mitigated by implementing best management practices, including but not limited to temporary stabilization measures as required by the Maine Department of Environmental Protection (MDEP). The applicant analyzed soils within the Proposed Project area for limitations requiring design accommodations and, where these limitations were found, would implement appropriate engineering and construction techniques to accommodate existing soil conditions.

CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Lines and Substation Projects (Revised 6/29/2018) (Environmental Guidelines), a standard manual that is used on all CMP projects and is consistent with the MDEP Erosion and Sediment Control Best Management Practices, would be used during construction (CMP 2018a). This manual contains effective erosion and sedimentation control (ESC) requirements, standards, and methods to protect soil and water resources during construction. The applicant would minimize the extent and duration of soil disturbance, protect exposed soil by diverting runoff, install temporary and permanent erosion control measures, and implement an effective inspection and maintenance program.

To protect natural resource areas, the applicant would incorporate a program specific to identifying areas of environmental risk due to surrounding topography, soils, and other unusual construction conditions. Environmental inspectors would meet with contractor personnel and third-party inspectors to discuss site-specific ESC approaches. Additionally, the program calls for more frequent inspections by the applicant's environmental inspection team for areas identified as having a higher environmental risk.

A geospatial data analysis of highly erodible soils or potentially highly erodible soils was completed on Segment 1 to determine areas of higher environmental risk. All areas would be evaluated during preconstruction walkovers with the applicant's environmental inspection team and MDEP third-party inspectors, and any additional higher risk areas observed during these walkovers would be added to the high-risk tracking table. The applicant would inspect higher risk areas more frequently and implement additional robust and effective environmental controls in these areas, including having a dedicated ESC maintenance crew; implementing additional structural ESC measures, which may include multiple layers of sediment barriers, upgradient flow diversion structures, and temporary sediment basins; and accelerating the work schedule to minimize the duration of exposed soils to the maximum extent practicable.

ESC inspection and maintenance logs would be reviewed by the MDEP third-party inspectors who would report their findings to MDEP and USACE weekly. The applicant would also provide progress reports to MDEP and USACE on a monthly basis during construction.

The applicant proposed measures discussed in this section would reduce intensity of the impacts on geology and soils and the time it would take to return the disturbed areas to a stable and productive state. Based on the assessment of potential impacts on geology and soils (described above), the Proposed Project would not result in adverse impacts on geology or soils with implementation of the committed measures.

3.3 Vegetation

3.3.1 Affected Environment

The analysis area for vegetation is a 0.5-mile buffer surrounding the centerline of the ROW and edges of substations (see Figure B-1 in Appendix B, Vegetation). The analysis area for sensitive plants and sensitive communities is the proposed 300-foot wide transmission line corridor.

The following summarizes the methods for identifying, describing, and quantifying vegetation in the analysis area.

- Vegetation mapping uses the U.S. Geological Services (USGS) Gap Analysis Project (GAP) National Terrestrial Ecosystems data set, which provides information on the distribution of native vegetation types, modified and introduced vegetation, developed areas, and agricultural areas of the United States (USGS 2011). This data set uses the NatureServe Terrestrial Ecological Systems Classification framework (Comer et al. 2003). This mapping includes a minimum mapping size of 1 acre; individual wetland communities were delineated with more precision and are discussed in Section 3.5, *Water Resources and Quality.*

- Rare plant and exemplary natural community locations in the analysis area were described based on data presented in the *Rare Plants Survey Narrative Report* (Tetra Tech and TRC 2018). This report is based on field surveys conducted in 2018. Prior to field surveys, a *Landscape Analysis and Field Survey Protocol* was prepared to develop a methodology to conduct rare plant surveys (Tetra Tech and TRC 2018: Appendix E).

3.3.1.1 General Vegetation

The cover types within and adjacent to the proposed transmission line corridor can be classified into four broad categories: upland forested (coniferous, hardwood, and mixed), early-successional (shrub-lands and herbaceous), wetland (forested, scrub-shrub, and emergent), and developed (residential, commercial, and industrial). Descriptions of each of the major cover types and commonly found species identified within and adjacent to the proposed new and expanded transmission line corridor are provided in the subsections below. Table 3.3-1 presents the acreages of vegetation communities found within 0.5-mile of Segments 1–3, which provides a regional context for understanding the affected environment that the Proposed Project would traverse. Vegetation communities are displayed in Table 3.3-1 and in Figure B-1 in Appendix B.

Table 3.3-1. Vegetation Communities in the Analysis Area by Segment

	Community Type within 0.5-mile Buffer (acres)[2]			
Vegetation Community[1] **Segment**	**1**	**2**	**3**	**Total**
Acadian Low-Elevation Spruce-Fir-Hardwood Forest	4,476	3,521	4,591	12,586
Acadian-Appalachian Montane Spruce-Fir Forest	9,962	1	–	9,963
Acadian-Appalachian Subalpine Woodland and Heath-Krummholz	15	–	–	15
Appalachian Hemlock-Hardwood Forest	–	–	601	601
Boreal-Laurentian Conifer Acidic Swamp and Treed Poor Fen	187	111	350	648
Central Appalachian Oak and Pine Forest	2	–	247	249
Central Appalachian Pine-Oak Rocky Woodland	51	44	554	649
Cultivated Cropland	–	20	1,223	1,243
Developed, Low Intensity	90	121	1,073	1,284

Vegetation Community[1]	Segment	Community Type within 0.5-mile Buffer (acres)[2] 1	2	3	Total
Developed, Medium Intensity		8	–	–	8
Developed, High Intensity		6	–	65	71
Developed, Open Space		168	373	2,585	3,126
Disturbed/Successional - Shrub Regeneration		190	76	421	687
Evergreen Plantation or Managed Pine		–	24	655	679
Harvested Forest - Grass/Forb Regeneration		829	315	148	1,288
Harvested Forest-Shrub Regeneration		4,391	556	635	5,582
Introduced Upland Vegetation - Annual Grassland		–	4	2	6
Introduced Upland Vegetation - Shrub		2	2	5	9
Introduced Upland Vegetation - Trees		–	–	2	2
Laurentian-Acadian Floodplain Systems		707	269	2765	3,741
Laurentian-Acadian Northern Hardwoods Forest		5,732	3,602	13,351	22,685
Laurentian-Acadian Northern Pine-(Oak) Forest		264	19	1695	1,978
Laurentian-Acadian Pine-Hemlock-Hardwood Forest		70	165	3027	3,262
Laurentian-Acadian Shrub-Herbaceous Wetland Systems		57	6	44	107
Laurentian-Acadian Swamp Systems		1,939	1,015	3,052	6,006
Managed Tree Plantation		3,530	1,168	621	5,319
North-Central Interior and Appalachian Rich Swamp		–	5	75	80
Open Water (Fresh)		264	1,669	1,280	3,213
Pasture/Hay		315	365	4,247	4,927
Ruderal forest		25	311	3,081	3,417
Undifferentiated Barren Land		564	36	112	712
Total[3]		33,844	13,798	46,507	94,149

[1] USGS 2011.
[2] CMP 2020b.
[3] Totals may not equal sums of rows because of rounding.
Source: CMP December 2020

The majority of the lands adjacent to the proposed new and expanded transmission line corridors consist of the upland forest cover type. The upland forest areas found in the vicinity of the transmission line corridor generally consist of the following forest region types:

- Central Hardwoods-Hemlock–White Pine
- Transition Hardwoods–White Pine
- Northern Hardwoods
- Spruce–Fir
- Northern Hardwoods–Spruce

Most of these forest region types transition into one another. In general, the conifer forest communities are typically found in the lowlands and northern hardwoods communities are found on mid-elevation hillsides or ridges.

Early successional vegetative cover type classification includes areas in the early stages of transition from a cleared condition to a forested condition. These areas are typically mature forests prior to trees being harvested. Included in this cover type are maintained utility transmission line corridors. Typically, the vegetation composition and structure associated with this classification gradually changes over time due

to natural succession. In the case of maintained transmission line corridors, the early-successional cover type is permanently maintained due to periodic removal of saplings within the transmission line corridor. Transmission line corridors generally range from herbaceous field to shrub-dominated cover. This cover type would be maintained along the proposed expanded Segment 2 and 3 corridors and the center portions of the proposed new Segment 1 corridor.

Many palustrine wetlands exist within the analysis area. Predominantly, these include the forested, scrub-shrub, and emergent wetland cover types. Forested wetlands are characterized by a dominance of woody vegetation that is at least 6 meters tall (Cowardin et al. 1979). Most of the forested wetlands in the vicinity of the transmission line corridors are classified as broad-leaved deciduous and/or needle-leaved evergreen forested wetlands. Most of the forested wetlands are located on the edges of the maintained transmission line corridors for the Proposed Project. Scrub-shrub wetlands are characterized by a dominance of woody vegetation less than 6 meters tall (Cowardin et al. 1979). These areas are typically dominated by shrubs and young trees, but may also include older trees that are stunted due to environmental conditions. Scrub-shrub wetlands within the proposed new and expanded transmission line corridors occur primarily as the result of the routine operation and maintenance of the transmission facilities. Scrub-shrub wetlands are often associated with streams and areas of seasonal saturation and flooding. Emergent wetlands are characterized by a dominance of erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et al. 1979). Emergent wetlands include areas commonly referred to as marshes and wet meadows. The proposed new and expanded transmission line corridors cross some areas that could be classified solely as emergent wetlands; however, they are often integrated with scrub-shrub wetlands. Refer to Section 3.5, *Water Resources and Quality*, for additional information on wetlands.

The majority of the land located along the proposed transmission corridor is undeveloped, particularly along Segment 1; however, some developed areas do exist, particularly along Segment 3. Residential is the most common type of development, followed by commercial, and to a lesser extent, industrial. Commercial development occurs within most of the municipalities that are located adjacent to the proposed new and expanded transmission line corridors; such development is generally associated with services for local communities.

3.3.1.2 Threatened, Endangered, and Special-Status Species and Communities

The applicant worked with the Maine Natural Areas Program (MNAP) to determine survey areas of rare or unique botanical features. Rare plant surveys were conducted in 2018 in areas identified to have reasonable potential for botanical features (Tetra Tech and TRC 2018).

State-Sensitive Habitat

Sensitive natural vegetation communities were classified based on MNAP's *Natural Landscapes of Maine–A Guide to Natural Communities and Ecosystems* (Gawler and Cutko 2010). MNAP natural community types ranks are displayed in Table 3.3-2. MNAP seeks to protect natural community types that are state ranked S1, S2, and S3, as well as outstanding examples of S4 and S5 communities (e.g., large or old growth forest stands).

Table 3.3-2. State Rarity Ranks (MNAP)

State Rank[1]	Status
S1	Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
S2	Imperiled in Maine because of rarity (6–20 occurrences or few remaining individual acres) or because of other factors making it vulnerable to further decline.
S3	S3 Rare in Maine (20–100 occurrences).
S4	Apparently secure in Maine.
S5	Demonstrably secure in Maine.
SH	Known historically from the state, not verified in the past 20 years.

[1] Definitions from the MNAP website (MNAP 2020a).

A total of six occurrences of three rare exemplary natural community types were identified during the 2018 surveys within the analysis area; three Jack Pine Forests, two Hardwood River Terrace Forests, and one Enriched Northern Hardwood Forest (Tetra Tech and TRC 2018). These locations are in Segment 1 and Segment 3 and are displayed on Figure B.2 in Appendix B.

Jack pine forest is state ranked as an S1 natural community. These areas were predominantly jack pine (*Pinus banksiana*), which requires wildfire for seed release from cones. Jack pine forest was identified in three distinct forest stands at the northern extent of Segment 1, all found within the Bradstreet Township in Somerset County.

Upper Floodplain Hardwood Forest is an S3 natural community that occurs on slightly elevated terraces of low-gradient rivers, with occasional flooding. Two communities of this type were observed during the July 2018 surveys (Tetra Tech and TRC 2018), one near Livermore Falls on Hunton Creek near the Androscoggin River in Segment 3, and the other in Segment 3 along the Carrabassett River near Anson.

The Enriched northern hardwood forest is an S3 natural community that occurs throughout much of Maine, often as small patches, occurring within larger matrix. The enriched northern hardwood forests identified during the surveys occurs on a gentle north facing slope, south of Moxie Stream, in Segment 1 in Somerset County.

Federally Listed or Protected Species and Habitat

There are three plant species in Maine that are federally listed under the ESA. Of these, one species, small-whorled pogonia (*Isotria medeoloides*), was determined to have potential to occur within the Proposed Project area and was observed during surveys in 2018 (Tetra Tech and TRC 2018). No U.S. Fish and Wildlife Service (USFWS)-designated Critical Habitat for listed plant species has been designated within the Proposed Project area. Small-whorled pogonia was listed as endangered on September 9, 1982 and reclassified threatened on October 6, 1994. The small-whorled pogonia grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it can be found in open stands of hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near smalls streams (USFWS 2017a). The primary threat to the small-whorled pogonia is the habitat loss and degradation due to development; forestry activity; recreational activities and trampling; and collecting for personal or commercial use (USFWS 1992). A single non-flowering, but quite robust individual was identified within a total of 8 miles of targeted search areas. The occurrence was located west of the south end of Allen Pond, Segment 3 in Greene, ME. This location is approximately 80 feet from the existing Segment 3 ROW clearing.

State-listed and Sensitive Species

No state-listed endangered or threatened plant species were observed within the Proposed Project area (Tetra Tech and TRC 2018). Seven sensitive plant species listed as State Rank of S1, S2, S3, or SH were observed within the analysis area: small-whorled pogonia (S1), red-stemmed gentian (*Gentiana rubricaulis;* S1), boreal bedstraw (*Galium kamtschaticum*, S2), Goldie's wood fern (*Dryopteris goldiana;* S2), long-leaved bluet (*Houstonia longifolia*, S2/S3), Clinton's bulrush (*Trichophorum clintonii*, S3), and slender false pimpernel (*Lindernia dubia* var. *anagallidea;* SH) (Tetra Tech and TRC 2018; Table 3.3-3). Small-whorled pogonia is discussed above.

Table 3.3-3. Rare Plants Observed Within the Analysis Area

Common Name (Scientific Name)	Segment(s)	State Rank	Within NECEC Clearing Limits?
Small-whorled pogonia (*Isotria medeoloides*)	3	S1	Yes [1]
Red-stemmed gentian (*Gentiana rubricaulis)*	2, 3	S1	No
Boreal bedstraw (*Galium kamtschaticum*)	1	S2	No
Goldie's wood fern (*Dryopteris goldiana*)	2	S2	Yes
Long-leaved bluet (*Houstonia longifolia*)	3	S2/S3	Yes [2]
Clinton's bulrush (*Trichophorum clintonii*)	2	S3	No
Slender false pimpernel (*Lindernia dubia* var. *anagallidea*)	3	SH	No

Source: Tetra Tech and TRC 2018

[1] The Vegetation Management Plan (VMP) (CMP 2020c) contains general avoidance measures for rare plants in general and specific provisions to avoid this population of pogonia.

[2] Within an area of existing clearing below Wyman Dam

Red-stemmed gentian was observed in two populations in Somerset County within existing ROW clearing. One population of approximately 150 individuals was mapped in Segment 3, in Concord, near Bingham. The second population of approximately 300 individuals was identified along the edges of a shallow wetland and into the forested edge of a northern white cedar swamp in Segment 2, near Moscow.

Boreal bedstraw was identified in three distinct populations at the northern extent of Segment 1 in Appleton Township in Somerset County. All three populations were found on old logging roads in northern hardwood forests that have previously undergone timber harvest. They were observed in the analysis area outside of the Proposed Project area.

Goldie's wood fern is a large wood fern, generally found in enriched moist woodland habitats, usually in hilly or mountainous terrain. A single plant was identified in an enriched inclusion of wetland in otherwise upland deciduous forest, along a former logging road/drainage within the Proposed Project area in Segment 2 in Moscow, Somerset County.

Long-leaved bluet is a small herbaceous perennial plant with a small, four-petaled, white flower. It can be found on rocky ledges or river shore gravels that are not strongly acidic and is usually found growing in small ledge crevices or depressions. One population is located on an elevated river terrace, just downstream from Wyman Dam in Segment 3. The population is dispersed across a relatively large, semi-bare gravel area within the existing Segment 3 ROW clearing.

Clinton's bulrush is a relatively low-growing sedge with solitary terminal spikelets. It can be found growing in diverse conditions; from dry or springy ledges, gravel or open woods and turfy shores. It is considered rare as it is at the southern limit of its range. A small population was identified approximately 0.1-mile upslope from an actively eroding Chase Stream. This population was found within the existing ROW clearing in Segment 2, mostly growing underneath a stand of bracken fern (*Pteridum* spp.), and co-

occurring with bunchberry dogwood (*Cornus canadensis*). Some clumps were also found growing within the sandy ROW access road. No populations were observed within the Proposed Project footprint.

Slender false pimpernel is an annual herbaceous plant that is generally found in open wet areas, though not along the coast or rivers, and can include old fields and roadsides. A small, very limited population of the slender false pimpernel was identified along Segment 3 near the town of Jay. It was observed near an abandoned gravel pit within the existing Segment 3 ROW. No populations were observed within the proposed limits of disturbance.

3.3.1.3 Invasive Species

An invasive plant is defined as a plant that is not native to a particular ecosystem, whose introduction does or is likely to cause economic or environmental harm or harm to human health. There are currently approximately 2,100 plant species recorded in Maine. Approximately one-third of those are not native. Of those plants that are not native, only a small fraction have potential to cause great harm to the landscape of Maine and are considered to be invasive (MNAP 2020b).

Locations within the Proposed Project footprint that contain any *Plant Species Currently Considered Invasive in Maine* listed in the *MNAP List of Invasive Plant Species of Maine* (MNAP 2020c) would be identified prior to the start of construction on any individual segment of the Proposed Project.

3.3.2 Environmental Consequences

3.3.2.1 Impact Analysis Area and Indicators

The impact analysis area for impacts on vegetation is the Proposed Project ROW; the impact analysis area for Sensitive Plants and Habitats is the Proposed Project footprint. The analysis area also includes a 0.5-mile buffer of the Proposed Project for vegetation communities. The following indicators were considered when analyzing impacts on vegetation:

- Disturbance to and long-term loss of natural (native species) vegetative communities or associations
- Disturbance to and loss of wetland and/or riparian areas caused by degradation of water quality, diversion of water sources, or erosion or sedimentation from altered drainage patterns
- Introduction or increased spread of noxious weeds and other invasive exotic weed species into the Proposed Project footprint and adjacent areas

3.3.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Common Impacts Across all Segments

General Vegetation

Long-term impacts on vegetation within the impact analysis area would be caused by vegetation clearing within the ROW. In Segment 1 of the Proposed Project, the applicant proposes to manage a 150-foot-wide strip of capable (i.e., species and specimens that are capable of growing into the conductor safety zone) vegetation to accommodate the proposed new transmission line. "In areas where the corridor will be tapered, instead of clearing the entire width of the 150-foot corridor only a 54-foot side section, centered under the conductors, will be cleared. Non-capable species of vegetation will be allowed to regrow in this area after construction, establishing scrub-shrub habitat with a height of approximately 10 feet. Taller, capable vegetation outside of this 54-foot wide area will be retained, with the height of the retained vegetation increasing from approximately 15 feet to 35 feet as the distance from the scrub-shrub area increases." (MDEP 2020). In Segments 2 and 3, CMP proposes to clear a 75-foot-wide strip of capable vegetation to accommodate the new transmission line. A vegetative buffer strip would be retained within either 30 or 50 feet of the ROW of any public roadway, depending on the subdistrict involved, and within either 75 or 100 feet of the normal high water mark of standing and flowing water bodies, depending on the type of water body in proximity to the proposed structures.

Tree species capable of growing into the conductor safety zone would be removed from the buffers during construction and be prevented from re-establishing during periodic scheduled vegetation maintenance operations. Selective transmission line corridor management techniques are discussed in Section 10 of the Site Law application (NECEC 2017) and have also been incorporated into the Proposed Project's Vegetation Clearing Plan (VCP) (CMP 2020d) and Vegetation Management Plan (VMP) (CMP 2020c). These techniques are designed to reduce the environmental effects on sensitive wetland communities and habitat for sensitive wildlife species.

The Proposed Project would result in impacts to vegetation that are illustrated in Tables 3.3-4 and 3.3-5. The tables show impacts in the ROW clearing limits and the reduced area during the maintenance phase of the project, respectively. Within Segment 1, the Proposed Project would cross or traverse 480 freshwater wetlands and convert 8.23 acres of wetland to shrub-scrub wetland. Within Segment 2, the Proposed Project would cross or traverse 147 freshwater wetlands and convert 1.13 acres of wetland to shrub-scrub wetland. Within Segment 3, the Proposed Project would cross or traverse 227 freshwater wetlands and convert 5.65 acres of wetland to shrub-scrub wetland (Maine LUPC 2020).

Table 3.3-4. Vegetation Clearing Impacts by Segment

	Clearing Impacts (acres) by Segment[2]			
Vegetation Community[1]	**1**	**2**	**3**	**Total**
Acadian Low-Elevation Spruce–Fir–Hardwood Forest	124	62	51	237
Acadian-Appalachian Montane Spruce–Fir Forest	209			209
Appalachian Hemlock-Hardwood Forest			3	3
Boreal–Laurentian Conifer Acidic Swamp and Treed Poor Fen	2	2	5	9
Central Appalachian Oak and Pine Forest			4	4
Central Appalachian Pine–Oak Rocky Woodland	1	<1	16	18
Cultivated Cropland		1	11	11
Developed, Low Intensity	5	1	5	11
Developed, Medium Intensity			<1	<1
Developed, Open Space	3	9	123	135
Disturbed/Successional–Shrub Regeneration	6	1	30	37

Vegetation Community[1]	Clearing Impacts (acres) by Segment[2]			
	1	2	3	Total
Evergreen Plantation or Managed Pine		4	6	10
Harvested Forest–Grass/Forb Regeneration	36	7	7	50
Harvested Forest–Shrub Regeneration	141	5	35	181
Introduced Upland Vegetation–Shrub		1		1
Laurentian–Acadian Floodplain Systems	8	5	44	57
Laurentian–Acadian Northern Hardwoods Forest	234	32	67	334
Laurentian–Acadian Northern Pine–(Oak) Forest	7		10	17
Laurentian–Acadian Pine-Hemlock–Hardwood Forest		3	36	39
Laurentian–Acadian Shrub-Herbaceous Wetland Systems	2	<1	3	6
Laurentian–Acadian Swamp Systems	31	9	40	80
Managed Tree Plantation	114	38	55	206
North-Central Interior and Appalachian Rich Swamp		<1	2	2
Open Water (Fresh)		<1	1	1
Pasture/Hay	11	5	70	86
Ruderal forest	1	12	19	32
Undifferentiated Barren Land	16	1	1	19
Total[3]	952	198	646	1,796

[1] USGS 2011.
[2] CMP 2020b.
[3] Totals may not equal sums of rows because of rounding
Source: CMP December 2020

Table 3.3-5. Vegetation Maintenance Impacts by Segment

Vegetation Community[1]	Maintenance Impacts (acres) by Segment[2]			
	1	2	3	Total
Acadian Low-Elevation Spruce–Fir–Hardwood Forest	38	62	51	150
Acadian-Appalachian Montane Spruce–Fir Forest	81			81
Appalachian Hemlock-Hardwood Forest			3	3
Boreal–Laurentian Conifer Acidic Swamp and Treed Poor Fen	<1	2	5	7
Central Appalachian Oak and Pine Forest			4	4
Central Appalachian Pine–Oak Rocky Woodland	<1	<1	16	17
Cultivated Cropland		<1	11	11
Developed, Low Intensity	1	1	5	7
Developed, Medium Intensity			<1	<1
Developed, Open Space	1	9	123	133
Disturbed/Successional–Shrub Regeneration	2	1	30	33
Evergreen Plantation or Managed Pine		4	6	10
Harvested Forest–Grass/Forb Regeneration	13	7	7	27
Harvested Forest–Shrub Regeneration	55	5	35	95
Introduced Upland Vegetation–Shrub		1		1
Laurentian–Acadian Floodplain Systems	1	5	44	50
Laurentian–Acadian Northern Hardwoods Forest	94	32	67	193
Laurentian–Acadian Northern Pine–(Oak) Forest	1		10	11
Laurentian–Acadian Pine-Hemlock–Hardwood Forest		3	36	39
Laurentian–Acadian Shrub-Herbaceous Wetland Systems	<1	<1	3	4
Laurentian–Acadian Swamp Systems	6	9	40	55
Managed Tree Plantation	33	38	55	126
North-Central Interior and Appalachian Rich Swamp		<1	2	2
Open Water (Fresh)		<1	1	1

Vegetation Community[1]	Maintenance Impacts (acres) by Segment[2]			
	1	2	3	Total
Pasture/Hay	4	5	70	79
Ruderal forest	<1	12	19	31
Undifferentiated Barren Land	6	1	1	8
Total[3]	341	198	646	1,185

[1] USGS 2011.
[2] CMP 2020b.
[3] Totals may not equal sums of rows because of rounding
Source: CMP December 2020

Threatened, Endangered, and Special Status Species and Communities

MNAP reviewed the Proposed Project for impacts on rare or unique botanical features (MDEP 2020). Proposed Project specific surveys were conducted in 2018 (Tetra Tech and TRC 2018). The surveys identified 15 rare plant occurrences and five unique natural communities in or adjacent to the corridor, including the following: small-whorled pogonia, Goldie's wood fern, Jack Pine Forest, Hardwood River Terrace Forest, and Northern Hardwood Forest.

State-Sensitive Habitat

The Proposed Project would result in 9.2 acres of clearing in a Jack Pine Forest located in Bradstreet Township (MDEP 2020: Page 82). There is only one other Jack Pine Forest Community known in the State, which is several miles north of this affected one, in the Number 5 Bog (a National Natural Landmark). Therefore, this impact would result in the loss of an important community that is extremely rare. The applicant revised its proposed compensation plan (dated July 2020) to mitigate impacts on rare or unique botanical features, including Jack Pine Forest (Section 9.0 in USACE 2020c). The compensation plan proposes that the applicant would make a contribution to the Maine Natural Areas Conservation Fund in the amount of $1,234,526.82 (MDEP 2020: Table F-2).

Approximately 0.7 acre of Hardwood River Terrace Forest in Segment 3 along the Carrabassett River in Anson would be permanently removed (CMP 2020t: Page 199). Approximately 0.6 acre of Hardwood River Terrace Forest in Segment 3 along Hunton Creek in East Livermore would be permanently removed (CMP 2020t: Page 281). Less than a half-acre of Enriched Northern Hardwood Forest in Moxie Gore in Segment 1 would be permanently removed (CMP 2020t: Page 115).

Federally Listed Plant Species

Surveys identified one individual small-whorled pogonia specimen adjacent to the existing transmission line corridor in Segment 3 in Greene (CMP 2020t: Page 310). The applicant proposed to avoid any impact to this plant by rebuilding two existing transmission line segments within the adjacent ROW, creating sufficient space for the proposed transmission line expansion so that no clearing or other disturbance would occur near this specimen. Because of the avoidance of this population, there would be no effect to the small-whorled pogonia. Section 7 Consultation has been completed for the Proposed Project (USFWS 2020a).

State Sensitive Plant Species

State sensitive plant species including boreal bedstraw, Goldie's wood fern, long-leaved bluet, Clinton's bulrush, and slender false pimpernel were observed within the analysis area (Tetra Tech and TRC 2018). Vegetation clearing of the transmission line corridor has the potential to impact rare plants and/or alter their habitat.

One Goldie's wood fern was observed within the Proposed Project area in Segment 3. To minimize impacts to Goldie's wood fern, the applicant proposed to maintain a riparian buffer along a small stream and remove capable species in the corridor. Within this buffer along the stream the applicant would remove all capable vegetation. The species is sensitive to canopy disturbance and removal of the canopy could reduce the suitability of the site for this species. The VCP (CMP 2020d) contains vegetative clearing restrictions to protect rare plants including Goldie's wood fern from construction or maintenance impacts.

The long-leaved bluet population is located within an area of existing maintained clearing below Wyman Dam in Segment 3 associated with the existing Segment 3 ROW. No new clearing impacts would occur in this area. Boreal bedstraw, Clinton's bulrush, and slender false pimpernel are within areas of existing clearing area of Segment 3 and are not within the Proposed Project Segment 3 corridor expansion area.

Invasive Species

Invasive species could be introduced or spread in the Proposed Project area via construction or maintenance vehicles, personnel, or tools. Invasive plants competitive adaptations include early leaf-out, aggressive reproductive strategies, and efficient dispersal methods (MNAP 2020b). Invasive plant species have potential to alter terrestrial and aquatic vegetation communities and habitats through direct competition for space, shading, monopolization of nutrient or water resources. Invasive species with potential to be in the analysis area are identified in *Table 1 – Invasive Plant Species* in the October 2020 VCP (CMP 2020d).

The Proposed Project's VCP establishes that prior to construction the applicant would identify any invasive plant species within the corridor and submit to the MDEP for review and approval, under a vegetation monitoring plan. The objective of the plan would be prevention of the introduction or spreading of invasive species as a result of construction.

3.3.2.3 Applicant Committed Measures

While there are impacts to vegetation which cannot be avoided, the following proposed measures are incorporated into the construction, operation, and maintenance of the Proposed Project to minimize and compensate for impacts.

The following vegetation plans have been developed. Their revision and implementation is required by the Site Law Certification (Maine LUPC 2020) and MDEP Order (MDEP 2020).

- New England Clean Energy Connect Plan for Protection of Sensitive Natural Resources During Initial Vegetation Clearing Plan (CMP 2020d)

- Post-construction Vegetation Management Plan (CMP 2020c)

Special conditions to reduce impacts on vegetation and protect sensitive plants and communities are included in plans and permits for this Proposed Project, including the VCP, VMP, Special Conditions for the USACE Section 404 Permit (USACE 2020b), and Conditions from the MDEP Order (MDEP 2020). Examples of these measures include marking the location of all natural resource buffers with flagging prior to the start of construction and prior to maintenance activities.

To safely construct and operate electric transmission lines, ROWs are typically cleared of trees and are continuously vegetated with herbaceous plants and shrubs. Vegetation within Segment 1 would be managed to minimize the overall impact to vegetation and habitat, including (a) full canopy height vegetation over certain rivers, (b) vegetation with a 35-foot minimum height, (c) deer travel corridors, (d)

tapered vegetation, and (e) riparian buffers. Appendix C to the MDEP Order (MDEP 2020) contains a discussion of these vegetation management requirements and is incorporated herein by reference and summarized below. (MDEP 2020). Compensation calculations determined the amount of compensation that the applicant committed to providing as mitigation for the Proposed Project; see the *Applicant Committed Measures* sections of the EA.

Full canopy height vegetation would be retained at Gold Brook crossing, the Mountain Brook crossing, and the Upper Kennebec River crossing. The transmission line would be underground at Upper Kennebec River and the topography around Gold Brook and Mountain Brook allow for full canopy height to be maintained.

In areas where minimum 35-foot tall vegetation would be maintained, only areas necessary to access pole locations or install and maintain poles would be cleared. In other areas within the entire width of the corridor only trees taller than 35 feet, or trees that may grow taller than 35 feet prior to the next scheduled maintenance, would be removed.

Ten deer travel corridors would be maintained in Upper Kennebec River Deer Wintering Area (DWA) in Moxie Gore in Segment 1. Two of these corridors would be adjacent to the Upper Kennebec River in the area where the transmission line would be underground, allowing maintenance of full height vegetation. Eight deer travel corridors would be created by selectively cutting vegetation in the ROW corridor to promote softwood growth necessary to provide winter habitat for deer. These travel corridors are located on each side of four HVDC structures identified in Table C-1 of the MDEP Order and would extend along the corridor under the conductors, where conductor height allows for taller vegetation within the corridor. Tree heights would vary based on structure height, conductor sag, and topography, but would generally range from 25 to 35 feet.

Tapering refers to a form of vegetation management along the transmission line corridor where increasingly taller vegetation is allowed to grow as the distance from the wire zone increases. Tapered vegetation would be conducted along the entire Segment 1 corridor, except where full canopy height vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors are required. Within the tapered corridor, a 54-foot wide wire zone would be cleared of all woody vegetation during construction and maintained as primarily native, scrub-shrub habitat with trees species not capable (“non-capable species”) of growing into the wire zone. In a tapered corridor, the area outside the wire zone would be selectively cut during construction to create a taper with vegetation approximately 15 feet tall near the wire zone and increasing to approximately 35 feet tall near the edge of the 150-foot wide corridor.

The VCP specifies restrictive vegetation management requirements for sensitive areas within the Proposed Project area including wetlands and streams, perennial streams within designated Atlantic Salmon habitat, significant vernal pools, Inland Waterfowl and Wading Habitat (IWWH), DWA, rare plant locations, and locations over mapped significant sand and gravel aquifers. The VCP and VMP incorporate riparian filter areas 100-foot buffers on perennial streams located in Segment 1, including all coldwater fisheries; waterbodies containing special concern, threatened, and/or endangered species; and outstanding river segments and 75-foot buffers on all other streams (CMP 2020c, CMP 2020d).

Sensitive Plant Species

Special conditions to protect sensitive plant species are included in plans and permits for the Proposed Project, including the VCP, VMP, Special Conditions for the USACE Section 404 Permit (USACE 2020b), and Conditions from the MDEP Order (MDEP 2020).

- The Vegetation Clearing Plan (CMP 2020d) contains general guidelines for vegetation clearing, as well as additional vegetative clearing restrictions for sensitive species that would ensure the avoidance of construction or maintenance impacts on rare plants.

- The applicant has committed to $10,000 to the Maine Natural Areas Conservation Fund for rare plant surveys to compensate for the effects of canopy disturbance on Goldie's wood fern (MDEP 2020: Table F-2).

- The compensation plan includes contribution to the Maine Natural Areas Conservation Fund in the amount of $1,234,526.82 to compensate for impacts to Jack Pine Forest and Goldie's wood fern in rare natural areas (MDEP 2020: Table F-2).

Invasive Plant Species

Special conditions from the USACE Clean Water Act Section 404 Permit require actions to prohibit the introduction of invasive organisms (USACE 2020b) and CMP would prepare a vegetation monitoring plan for invasive species prior to work on any Segment of the Proposed Project. To minimize the spread of invasive plant species, all off-road equipment and vehicles (operating off of existing open and maintained roads) must be cleaned prior to entering the construction site to remove all soil, seeds, vegetation, or other debris that could contain seeds or reproductive portions of plants. All equipment would be inspected prior to off-loading to ensure that they are clean. These actions would ensure that invasive species do not have a significant adverse effect on vegetation communities in the analysis area.

3.4 Wildlife

3.4.1 Affected Environment

3.4.1.1 General Wildlife

A wide variety of mammals, birds, reptiles, and amphibians are likely to use the analysis area throughout the year or during different times of the year. Amphibian species commonly found in the upland forests include the redback salamander (*Plethodon cinereus*), spotted salamander *(Ambystoma maculatum*), wood frog (*Rana sylvatica*), gray tree frog (*Hyla versicolor*), and American toad (*Bufo americanus*). Reptile species that can occur include the northern red belly snake (*Storeria occipitomaculata*) and eastern garter snake (*Thamnophis sirtalis*).

Bird species represented in the forested habitat include ground or shrub nesting species such as the ruffed grouse (*Bonasa umbellus*), winter wren (*Troglodytes troglodytes*), Swainson's thrush (*Catharus ustulatus*), ovenbird (*Seiurus aurocapillus*), and Canada warbler (*Wilsonia canadensis*). Cavity nesting birds typically include the black-capped chickadee (*Parus atricapillus*), white-breasted nuthatch (*Sitta* carolinensis), and hairy woodpecker (*Picoides villosus*). Canopy/mid-story nesting birds include the golden-crowned kinglet (*Regulus satrapa*), blue-headed vireo (*Vireo solitarius*), American redstart (*Setophaga ruticilla*), and the black-throated green warbler (*Dendroica virens*). Raptor species encountered include the barred owl (*Strix varia*), broad-winged hawk (*Buteo platypterus*), and sharp-shinned hawk (*Accipiter striatus*). Other avian species frequently encountered in forests include the raven (*Corvus corax*), red-breasted nuthatch (*Sitta canadensis*), bay-breasted warbler (*Dendroica castanea*), red crossbill (*Loxia curvirostra*), and evening grosbeak (*Coccothraustes vespertinus*).

The white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*), black bear (*Ursus americanus*), and fisher (*Martes pennanti*) are common mammal species that use forested habitat. Other representative

mammal species include southern red-backed vole (*Clethrionomys gapperi*), deer mouse (*Peromyscus maniculatus*), red squirrel (*Tamiasciurus hudsonicus*), porcupine (*Erethizon dorsatum*), and snowshoe hare (*Lepus americanus*).

Bird species that use early successional shrub scrub habitats include the chestnut-sided warbler (*Dendroica pensylvanica*), Nashville warbler (*Vermivora ruficapilla*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), indigo bunting (*Passerina cyanea*), and the white-throated sparrow (*Zonotrichia albicollis*). The red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*) are also commonly observed in these habitats.

Herptile species that use this cover may include redback salamander, American toad, wood frog, and eastern garter snake.

Mammals frequently encountered in this early successional include edge-associated species such as the southern redbacked vole, meadow vole (*Microtus pennsylvanicus*), short-tailed shrew (*Blarina brevicauda*), ermine (*Mustela erminea*), and coyote (*Canis latrans*). White-tailed deer and moose also frequent these habitats for foraging and bedding opportunities.

Several mammal species utilize forested wetland habitat. Examples include moose, white- tailed deer, snowshoe hare, mink (*Mustela vison*), black bear, raccoon (*Procyon lotor*), bobcat (*Felis rufus*), beaver (*Castor canadensis*), and woodland jumping mouse (*Napaeozapus insignis*).

In addition, herptiles such as the wood frog, spotted salamander, blue-spotted salamander (*Ambystoma laterale*), northern spring peeper (*Pseudacris crucifer*), American toad, and eastern garter snake use forested wetland habitat for breeding, cover, and/or foraging. Bird species known to utilize forested wetland habitat include wood duck (*Aix sponsa*), pileated woodpecker (*Dryocopus pileatus*), northern waterthrush (*Seiurus noveboracensis*), northern parula warbler (*Parula americana*), and Canada warbler.

Most of the scrub-shrub wetlands within the existing transmission line corridors are maintained in an early successional stage through transmission line corridor vegetation management practices in the current ROW for Segments 2 and 3. Scrub-shrub wetlands are structurally similar to early-successional habitats. However, they generally have a greater diversity and abundance of wildlife species due to the seasonal presence of water. Scrub-shrub wetlands, especially those with inundated depressions, provide breeding habitat and cover for herptiles including wood frog, spotted and blue-spotted salamanders (*Ambystoma laterale*), American toad, gray tree frog, spring peeper, and eastern garter snake. Bird species known to inhabit these areas include woodcock (*Scolopax minor*), alder flycatcher (*Empidonax alnorum*), olive-sided flycatcher (*Contopus virens*), yellow warbler (*Dendroica petchia*), common yellowthroat, song sparrow, and red-winged blackbird (*Agelaius phoenicus*).

Small mammals are generally abundant in scrub-shrub wetlands due to the thick understory and ground cover. Mammal species that are common to this wetland type include beaver, muskrat (*Ondatra zibethicus*), mink, masked shrew (*Sorex cinereus*), water shrew (*Sorex palustris*), snowshoe hare, meadow vole, and southern redbacked vole. Other mammals that utilize that habitat type include moose, white-tailed deer, and raccoon. Insectivorous species such as masked shrew and water shrew are often abundant in bogs.

Beaver activity often results in the development of extensive emergent wetlands that form in flooded areas. Muskrat are also common in shallow and deepwater marshes and feed on the abundant emergent vegetation. Other mammals that utilize emergent wetland habitat include little brown myotis (Myotis *lucifugus*), raccoon, mink, and white-tailed deer. Herptiles common to emergent wetlands include northern spring peeper, pickerel frog (*Rana palustris*), green frog (*Rana clamitans*), eastern garter snake,

and painted turtle (*Chrysemys picta*). Bird species that are frequently observed in emergent wetlands include great blue heron (*Ardea herodias*), American black duck (*Anas rubripes*), red-winged blackbird, tree swallow (*Tachycineta bicolor*), yellow warbler, and swamp sparrow (*Melospiza georgiana*).

3.4.1.2 Threatened, Endangered, and Special Status Species and Habitat

Federally Listed or Protected Species and Habitat

The following threatened and endangered ESA-listed wildlife species potentially occur within or near the Proposed Project: Atlantic salmon (*Salmo salar)*, Canada lynx (*Lynx canadensis*), and the northern long-eared bat (*Myotis septentrionalis*) (See Exhibit A of the Biological Assessment (BA) (USACE 2020c)). Critical habitat has been designated for Canada lynx and Atlantic salmon. The applicant requested the most recent Official Species List, which was provided by the USFWS on January 15, 2020 (USFWS 2020b). The species and habitats originally identified by the USFWS in 2017 have remain unchanged (USACE 2020c). A Final BA was prepared under the direction of USACE and DOE to address potential impacts (USACE 2020c).

Atlantic Salmon

The Atlantic salmon is an anadromous fish which was once present in most major rivers north of the Hudson River. Remnant populations are now known to exist in a limited number of rivers across Maine. Atlantic salmon typically spend 2 to 3 years in freshwater and then migrate to the ocean where they spend an additional 2 to 3 years before returning to their natal river to spawn.

The Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon is listed as federally endangered under the joint jurisdiction of the USFWS and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) (74 FR 29344; June 19, 2009). The Atlantic salmon GOM DPS encompasses all naturally spawned and conservation hatchery populations of anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River and wherever these fish occur in the estuarine and marine environment. The upstream extent of the freshwater range of the GOM DPS is delimited by seven impassable natural falls located within the Androscoggin, Kennebec, and Penobscot drainages.

The Proposed Project corridor crosses the following watersheds within the GOM DPS: Upper and Lower Kennebec, St. George/Sheepscot, and the Lower Androscoggin. However, upstream fish passage on the Kennebec River system is limited, as salmon cannot get above the dams in Anson/Madison, and therefore are unable to get to Segments 1, 2, and portions of Segment 3.

The NMFS designated critical habitat for listed Atlantic salmon on June 19, 2009. The critical habitat designation for the GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 12,161 miles of perennial river, stream, and estuary habitat and 308 square miles of lake habitat within the range of the GOM DPS and within which are found those physical and biological features essential to the conservation of the species. At the time that critical habitat for Atlantic salmon was designated, these essential features of critical habitat were described using two terms: primary constituent elements (PCEs) and physical and biological features (PBFs). Since that time, new critical habitat regulations (81 FR 7414; February 11, 2016) eliminate use of the term PCE but retain and define the term PBF. Critical habitat for Atlantic salmon includes two PCEs as follows: 1) sites for spawning and rearing and 2) sites for migration, both of which include several PBFs. All designated critical habitat is considered occupied by endangered Atlantic salmon at the Hydrologic Unit Code (HUC)-10 watershed level, although not all water bodies within a given watershed are necessarily

occupied by Atlantic salmon at any given time. No waterbodies in Segments 1 or 2 of the Proposed Project are identified as NOAA-designated Atlantic salmon critical habitat. Half of the waterbodies (111 of 222) intersected by the transmission line corridor in Segment 3 are identified as Atlantic salmon critical habitat (USACE 2020c: Exhibit G).

Canada Lynx

Lynx are common throughout the boreal forests of Alaska and Canada and the southern portion of their range once extended into the Rocky Mountains, Great Lakes states, and the northeastern U.S. Breeding populations are strongly correlated to the abundance of snowshoe hare, their primary food source. Dense conifer forest understory in a regenerating sapling spruce-fir forest (15–35 years old) is preferred by both the snowshoe hare and the lynx. Today, resident breeding populations of lynx are found in Maine. The Proposed Project corridor enters the Canada lynx critical habitat at the southern border of Johnson Mountain Township in Segment 3 and extends to the Canadian border in Beattie Township in Segment 1. Based on information provided by Maine Department of Inland Fisheries and Wildlife (MDIFW), documented occurrences of the Canada lynx have been reported near the Proposed Project corridor in Segments 1, 2, and 3 (USACE 2020b).

The Canada lynx was listed in 2000 as threatened under the ESA and is also a State Species of Special Concern in Maine. The Canada lynx in the contiguous United States was designated a DPS, qualifying portions of northern Maine as federally listed Critical Habitat under the ESA. Canada lynx habitat covers northwestern portions of the State of Maine and includes Aroostook and Piscataquis counties and northern Penobscot, Somerset, and Franklin counties, where snow depths are highest in the state.

Northern Long-eared Bat

Northern Long Eared Bat (NLEB) is found across much of the eastern and north central United States and all Canadian provinces from the Atlantic coast west to southern Northwest Territory and eastern British Columbia. This species hibernates during the winter in caves and mines called hibernacula. In the spring and summer, they are forest-dwelling and roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Breeding begins in late summer or early fall when males swarm the hibernacula. After a hibernation period, females establish “maternity roost” trees in the spring and pups are generally born between late May and late July (USFWS 2017b). Since the location of maternity roost trees is largely unstudied, there is presumed occurrence of roosting bats in the northern hardwood and conifer forests consistent with areas found along the Proposed Project corridor in Segments 1 through 3.

State-listed Species

The Proposed Project is located in or near habitat for the following species included on Maine’s Endangered or Threatened Species list or identified as species of special concern.

- Roaring Brook Mayfly (*Epeorus frisoni*)
- Northern Spring Salamander (*Gyrinophilus porphyriticus porphyriticus*)
- Brook Floater Mussel (*Alasmidonta varicosa*)
- Wood Turtle (*Glyptemys insculpta*)
- Rusty Blackbird *(Euphagus carolinus)*
- Bicknell’s Thrush (*Catharus bicknelli*)

- Great Blue Heron (*Ardea herodias*)
- Golden Eagle (*Aquila chrysaetos*)
- Northern Long-eared Bat
- Little Brown Bat (*Myotis lucifugus*)
- Eastern Small-footed Bat (*Myotis leibii*)
- Northern Bog Lemming (*Synaptomys borealis*)
- Canada Lynx

Roaring Brook mayfly, a State-listed Threatened Species under the Maine Endangered Species Act (MESA), is known to be in the northern portions of the Proposed Project area (MDIFW 2017). They can occur in high elevation, perennial headwater streams draining off forested (hardwood or mixed) slopes at or above 1,000 feet (including unmapped streams) within or adjacent to the currently documented range (northern Appalachian Mountain Range, stretching from Mt. Katahdin to the western border with New Hampshire and Canada). Any instream work in unmapped perennial or intermittent streams has the potential to impact this species.

Northern spring salamanders, a State Species of Special Concern, are known to be in the northern portions of the Proposed Project area. They occur in perennial or intermittent headwater streams, but they are also found in larger third order streams and rivers with suitable substrate (large cobble and/or gravel bars) within the documented range of primarily the western Maine mountains north and east into mountains of central Penobscot County. CMP determined there were Northern Spring Salamanders (NSS) and Roaring Brook Mayflies (RBM) in two streams crossed by the Proposed Project, Gold Brook and Mountain Brook (CMP 2018a; MDEP 2020). MDIFW considers the South Branch Moose River as occupied by RBM until CMP can acquire further information indicating otherwise.

MDIFW identified that several species of rare mussels have been documented within the analysis area, including the brook floater (State Threatened); the yellow lampmussel (State Threatened); the tidewater mucket (State Threatened); and the creeper (Special Concern) (MDIFW 2017). These rare animals have experienced significant declines throughout their ranges, with many populations being extirpated due to low population densities, fragmented distributions, and limited or no evidence of recruitment. Because they require clean, free-flowing riverine habitat, they are especially vulnerable to impacts from pollution, sedimentation, dams, and surrounding land use practices that degrade or alter its aquatic habitat.

Wood turtle, a State Species of Special Concern, uses a mix of aquatic and terrestrial habitats throughout the year including meadows, shrub thickets, farmland, and deciduous forests, as well as bogs, forested wetlands, vernal pools, and streams. Generally wood turtle appears to prefer edge-associated terrestrial habitats as riparian areas and forest-opening edges have dense shrubbery or ground cover for protection and food, and provide open areas for basking to regulate their body temperature (MDIFW 2017). Mapped within the 0.5-mile buffer of the Proposed Project were 161.4 acres of potentially suitable wood turtle habitat (CMP 2020e).

Rusty blackbird, a State Species of Special Concern, nests frequently along bogs, muskeg swamps, beaver (*Castor canadensis*) ponds, and streams in robust tree nests (Avery 2020). Rusty Blackbirds have declined alarmingly (85–95 percent) in numbers over the past 40 years (1970–2010) (Avery 2020). Potential factors promoting this decline have been identified and include loss of wetlands used by

wintering individuals in the Southeast, contaminants on breeding grounds, poisoning of other blackbirds on wintering roosts (with the Rusty as an incidental victim), and increasing disturbance of boreal wetlands where this species breeds (Avery 2020). Rusty blackbird is known to occur within Segment 1 (MDIFW 2017). Mapped within the 0.5-mile buffer of the Proposed Project were 125.7 acres of potentially suitable rusty blackbird habitat (CMP 2020e).

Bicknell's thrush, a State Species of Special Concern, can be found in sub-alpine forests usually dominated by balsam fir and red spruce at elevations around 2,700 feet that typically have a history of disturbance resulting in a stunted dense understory. Its breeding range is limited and fragmented, with known occurrences in the mountains of western and central Maine. The nesting and fledgling periods are typically from June 1 through August 15. Portions of Segment 1 intersect with occurrences of Bicknell's thrush. Breeding individuals are known to be very sensitive to disturbance.

The great blue heron is a State Species of Special Concern due to a 64 percent decline in the coastal breeding population observed from 1983 to 2009. Aerial surveys for great blue heron rookeries were conducted along the analysis area in 2020. MDIFW provided CMP with the known mapped locations of where the Proposed Project crosses each IWWH area in Segments 1, 2 and 3. Concurrent with the eagle survey, CMP visually inspected all IWWH areas intersected by the Proposed Project on Segments 1, 2, and 3, as well as areas within 75 feet of each of these IWWHs. No great blue herons or heron nests were observed during the survey (Burns & McDonnell 2020).

Bald eagles and golden eagles are federally protected under the Eagle Act, bald eagles are State Species of Concern, and golden eagles are Maine Endangered. Bald eagles are known from northwestern Maine but no nests have been observed in the analysis area. Bald eagles typically nest in large trees particularly near large water bodies. Based on the 2018 MDIFW nest point location data and CMP aerial surveys conducted in 2019 and 2020, there are no known eagle nests within 660 feet of the Proposed Project corridor from the Larrabee Road Substation in Lewiston to the Canada border (Burns & McDonnell 2020).

Although a comprehensive statewide inventory for bats has not been completed, it is likely that several bat species occur within the Proposed Project area during migration and/or the breeding season. The primary threat to bats is White Nose Syndrome (WNS), particularly in the northeast where some bat species populations have declined up to 99 percent (USFWS 2017b). WNS is known to occur in the entire state of Maine and most areas of the eastern and midwestern United States. The three species with confirmed WNS are the NLEB, little brown-bat and eastern small-footed bat.

Northern bog lemming is a State Threatened Species. MDIFW's traditional view of northern bog lemmings is that they typically occur in moist, wet meadows or boggy areas, often in conjunction with artic or alpine tundra and spruce-fir forests at elevations greater than 2,700 feet. CMP determined that northern bog lemming does not occur within the Proposed Project area (MDEP 2020).

State Sensitive Habitat

Coldwater Fisheries

The term coldwater fishery pertains to streams that support fish adapted to coldwater environments, with most recognized species being members of the family Salmonidae (trout and salmon). The most common coldwater species that occurs in the analysis area is the brook trout (*Salvelinus fontinalis*). Maine is one of the last places where native brook trout habitat is still intact and wild brook trout still thrive (MDEP 2020). Brook trout prefer clean, well-oxygenated, cold waters between 50 and 65 degrees Fahrenheit. Brook trout have been removed from much of their range because of competition from warm-water game species including bass and perch (MDIFW 2020). Brook trout are resilient within undisturbed habitats.

Exhibit 7-7 of the 2017 Site Law Application (NECEC 2017) details that 192 waterways within the Proposed Project were designated by MDIFW as habitat for brook trout. The MDEP order summarizes additional waterways as being coldwater fisheries habitat, with the Proposed Project encompassing 583 crossings of rivers, streams, or brooks, of which 421 contain coldwater fisheries (MDEP 2020: Appendix E). The breakdown by Segment is presented below:

- **Segment 1**: 237 of the 280 rivers, streams, or brooks contain coldwater fisheries habitat
- **Segment 2**: 46 of the 68 rivers, streams, or brooks contain coldwater fisheries habitat
- **Segment 3**: 138 of the 235 rivers, streams, or brooks contain coldwater fisheries habitat

Deer Wintering Area (DWA)

Preferred winter cover for deer is found in stands of spruce, northern white cedar, and hemlock, which provide optimum cover and snow-carrying capacity. These areas provide microclimate and forage conditions critical for the survival of deer during the snowy, cold winters of interior Maine. High and moderate value DWAs are also regulated and protected under Maine's Natural Resources Protection Act (NRPA). The alignments of Segments 1 through 3 pass by or through several DWAs. None of the DWAs were rated by MDIFW as moderate or high value (MDEP 2020: Page 87). In Segment 1, the DWAs are in Moxie Gore and West Forks Plantation (CMP 2020t; Pages 106-114). Segment 2 passes through one DWA near Moscow (CMP 2020t; Page 164). In Segment 3, the Proposed Project passes through DWAs in the vicinity of Embden, Starks, Industry, and Leeds (CMP 2020t: Pages 180-183, 213-215, 219-221, 229-231, 294-295, 299-304).

Significant Vernal Pools and Other Significant Wildlife Habitat

Significant wildlife habitat is a statutorily defined term in Maine and includes significant vernal pool habitat (SVP) and high and moderate value inland waterfowl and wading bird habitat (IWWH) (38 M.R.S. § 480-B(10)). Which vernal pools and surrounding habitat qualify as an SVP is based on the criteria in Chapter 335 Section 935; what habitat qualifies as an IWWH is specified in Chapter 335 Section 10.

Inland Waterfowl and Wading Bird Habitat (IWWH)

IWWH provide important breeding, feeding, migration, staging, and wintering habitat for waterfowl and wading bird species. IWWH is also regulated and protected under Maine's NRPA.

Significant Vernal Pools (SVP)

Vernal pools are seasonally inundated depressions that are often associated with forested wetlands. A vernal pool habitat is considered significant by MDEP if it has a high habitat value, either because (1) a state-listed threatened or endangered species, such as a spotted turtle, or a rare species, such as a ribbon snake, uses it to complete a critical part of its life history, or (2) there is a notable abundance of specific wildlife, such as blue spotted salamander, wood frog, or fairy shrimp (MDEP 2009). "Significant vernal pool habitat" includes the vernal pool itself and the area within a 250-foot radius of the spring or fall high water mark of the pool, which is considered critical terrestrial habitat (MDEP 2009).

Sixty-one SVPs would be crossed by the entire Proposed Project covered in the MDEP Order, which included Segments 4 and 5, which are not included in the Proposed Project analyzed in this EA. Forty-eight SVPs would be crossed by the Proposed Project analyzed in this EA (Segments 1, 2, and 3), including six in Segment 1, two in Segment 2, and 40 in Segment 3, and one is present at the proposed new Merrill Road Substation (MDEP 2020: Page 82).

3.4.1.3 Migratory Birds and Raptors

Migratory birds are regulated by the USFWS under the Migratory Bird Treaty Act. The analysis area provides habitats that are used both seasonally and year-round, for both breeding and migration, by a variety of migratory bird species. Totals of habitat types present in the analysis area are detailed in Section 3.3, *Vegetation.* Representative bird species that may use the analysis area are detailed in Section 3.4.1.1, *General Wildlife*, above.

3.4.1.4 Wildlife Corridors

Segment 1 is part of a largely unfragmented forest block that is more than 500,000 acres, which itself is part of an even larger area that is one of the world's last remaining contiguous temperate broadleaf-mixed forests. The western Maine region supports exceptional biodiversity and is expected to be especially effective at maintaining biodiversity as the climate changes. These qualities make the area unique and important for wildlife (MDEP 2020).

3.4.2 Environmental Consequences

3.4.2.1 Impact Analysis Area and Indicators

The impact analysis area for impacts on wildlife is a 0.5-mile buffer from the transmission centerline and the edges of substations. The impact analysis area for significant wildlife habitat areas is the 300-foot wide transmission line corridor.

Impact indicators for wildlife consist of direct mortality; habitat loss; habitat degradation and fragmentation; increased opportunities for predation; and disturbance. The following indicators were considered when analyzing impacts on wildlife:

- Disturbance to and loss or degradation of habitat
    - Loss or degradation of terrestrial habitat from disturbance to vegetation during construction
    - Degradation of aquatic and wetland habitat from increased soil erosion and/or chemical contamination
    - Increased risk of vehicular mortality due to construction activities and vehicular travel during operation and maintenance
    - Displacement or decrease in fitness due to noise and human activity associated with all aspects of construction, operation, and maintenance
- Special Status Species
    - Direct loss to any population of special status species that would jeopardize the continued existence of that population
    - Loss to any population of wildlife or an activity that would result in a species being listed or proposed for listing as endangered or threatened
- Wildlife Corridors

- Disturbance to or loss or degradation of habitat functioning as core habitat or linkage corridor

3.4.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

General Wildlife

Construction activity and noise may temporarily disturb or displace animals that live in and use the habitat in the Proposed Project area. Potential short-term impacts on wildlife as a result of the construction of the Proposed Project may include direct mortality of individual wildlife resulting from crushing by construction equipment, collapse of burrows, vehicle strikes, interference with breeding, loss of habitat, and loss of forage plants. These impacts would result from the clearing of forests, temporary access roads, and construction of transmission line infrastructure. Potential impacts on wildlife include disturbances related to construction activities, including clearing, heavy equipment use, noise, and dust emissions. These impacts are expected to be short-term.

Long-term impacts on wildlife as a result of the Proposed Project would include the reduction of cover, nesting areas, and food resources caused by habitat loss, fragmentation, human disturbance from operation and maintenance, the increased risk of direct mortality resulting from vehicle strikes along new access roads and spurs, and mortality related to increased opportunities for predation via new transmission line structures. Raptor species may use transmission infrastructure as perching and nesting habitat, which may result in increased predation pressure on prey species (discussed in more detail below under *Migratory Birds and Raptors*).

Additionally, there could be an increased probability of bird strikes and/or electrocutions of birds with transmission lines and structures. The Applicant indicated that the design of the Proposed Project considers and meets both the 2006 standards: Suggested Practices for Avian Protection on Power Lines (APLIC 2006) and the 2012 guidelines: Reducing Avian Collisions with Power Lines - The State of the Art in 2012 (APLIC 2012); applying recommended measures to minimize the risk of avian electrocution and collision. Design measures have been incorporated to minimize impacts to raptors, cranes, and waterfowl. For example, transmission line Sections 432 and 3007 meet APLIC grounding and bonding, configuration, phase separation, clearance, and appurtenant equipment recommendations. The likelihood of avian electrocutions, collisions, and mortality resulting from avian interaction with transmission line facilities would be minimized.

Federally Listed or Protected Species and Habitat

The Final BA for the Proposed Project for the USACE Section 404 Permit intensively details potential impacts on Atlantic Salmon, Canada lynx, and northern long-eared bat, and is incorporated here by reference (USACE 2020c). Section 7 consultation has been concluded for the Proposed Project (USFWS 2020a).

Atlantic Salmon

The Proposed Project may affect, but is not likely to adversely affect, Atlantic salmon. Atlantic salmon critical habitat occurs within a number of water bodies that would be crossed by the Proposed Project in Segment 3. However, no waterbodies in Segments 1 or 2 of the Proposed Project are located in NOAA-designated Atlantic salmon critical habitat. There is no proposed instream activity for any stream, at any time, or at any location related to clearing activity, installation of transmission line structures, or substation site development. Construction access across any stream (when needed) would be provided by a temporary crossing that entirely spans the stream and is constructed and maintained in a manner to minimize the potential for sedimentation and turbidity. Access to the transmission line corridor for maintenance and operation activities after construction would be infrequent and utilize existing upland access ways and snowmobile trail bridges to the greatest extent possible, and would only ford streams, following best management practices prescribed in the BA (USACE 2020c).

Environmental controls would be implemented and maintained during construction to avoid and minimize the potential for water quality degradation associated with soil erosion and sedimentation and other pollutants. Environmental controls would remain in place until the site is fully stabilized per applicant guidelines and MDEP inspections. Herbicide application would be precluded from 100 feet of all streams within the GOM DPS, which includes the designated critical habitat. Replacements of culverts would not occur within the designated critical habitat. All replacement of culverts outside the Proposed Project area would only be in the vicinity of Segments 1 and 2. Since impacts to Atlantic salmon streams are avoided or minimized as described herein, construction of the Proposed Project as proposed is not likely to have adverse effects on Atlantic salmon.

Canada Lynx

The Proposed Project may affect, but is not likely to adversely affect, Canada Lynx, its critical habitat, or the Section 7 review area described below. The proposed transmission corridor in the northern section of the Proposed Project between Beattie Twp and Johnson Mountain Twp is located in the critical habitat area, a very remote, predominantly forested area, which is managed for commercial timber production. The USFWS has identified a Section 7 review area that includes the Canada lynx designated critical habitat and most of northern Maine. The Section 7 review area, beyond the boundary of the designated critical habitat, includes Segments 1, 2, and portions of Segment 3 of the Proposed Project between Johnson Mountain Twp and the Town of Embden. The southern limit of the Section 7 review area extends to a location near Town Road in Embden.

Total Forest cover removal would be minimized through the reduced clearing width in Segment 1 which would minimize the Proposed Project's effect on the Canada lynx. Proposed Project construction would be short term and construction activities in the critical habitat and the Section 7 review area would be less than 24 months. Increases in traffic volume would be minimal and temporary and project personnel would be instructed to obey posted speed limits, as well as reduced speed limits on logging roads. The applicant would closely coordinate speed limit reductions with the land management companies who own and or operate these roads to facilitate safe travel and minimize potential impacts to Canada lynx. For these reasons, the proposed action is not expected to have adverse effects on Canada lynx.

Northern Long-eared Bat

The Proposed Project may affect northern long-eared bat by removing trees within the range of NLEB. The USFWS, under the 4(d) rule, has offered a streamlined consultation framework for the NLEB. This optional framework allows federal agencies to rely upon the USFWS January 5, 2016, intra-Service Programmatic Biological Opinion (BO) in the Final 4(d) Rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the Project with sufficient detail to support the required determination; and (3) enabling the

USFWS to track effects and determine if re-initiation of consultation is required per 50 CFR 402.16. The Proposed Project is eligible to utilize the streamlined Section 7 consultation if it is determined that the project is not near any known hibernacula or maternity roost trees. As the Proposed Project is not near any known hibernacula or maternity roost for NLEB, it utilized this streamlined Section 7 consultation and received a Verification Letter from the USFWS stating that "any take that may occur as a result of [the Proposed Project] is not prohibited under ESA Section 4(d)" (USACE 2020c: Appendix J; USFWS 2020c).

State-listed Wildlife Species

The Proposed Project would result in 26.4 acres of forest conversion in northern spring salamander (NSS) and Roaring Brook mayfly (RBM) habitat (CMP 2018a; MDEP 2020).

Construction of the Proposed Project is not expected to affect known occurrences of state-listed mussel species. The occurrences of the species are located within larger rivers and streams that would be spanned by the transmission line. Structures would be placed on either side of these rivers and streams and no in-stream crossings by access roads or vehicles are proposed in these locations; therefore, in-stream construction would be avoided. To protect known mussel habitat from potential impacts, the applicant would implement erosion and sedimentation control measures to prevent sedimentation into waterbodies and maintain the existing water quality.

Of the 161.4 acres of potentially suitable wood turtle habitat in the 0.5-mile buffer of the Proposed Project, 20.6 acres of wood turtle habitat would be affected by forest conversion and 0.01 acre by permanent fill (CMP 2020e).

Rusty blackbird has a higher fledging success rate in forests over 20 years old and in wetland forests with large buffers (Avery 2020). Of the 125.7 acres of potentially suitable rusty blackbird habitat in the 0.5-mile buffer, 3.3 acres of rusty blackbird habitat would be affected by forest conversion (CMP 2020e).

MDIFW provided one known habitat occurrence for Bicknell's thrush which intersects with the Proposed Project in Johnson Mountain Twp (MDIFW 2017). The total area of this breeding habitat is approximately 3,193 acres and is associated with the high elevation sub-alpine forest on Coburn Mountain. The Proposed Project crosses the habitat for 2,500 linear feet, in a particularly narrow portion at the northeastern corner. Approximately 8.86 acres of habitat would be cleared of capable species to accommodate the Proposed Project. Bicknell's thrush may utilize the successional habitat which would be maintained within the Proposed Project as nesting habitat and are known to abandon nests as a result of minor disturbance. The applicant would suspend tree clearing activities during the NLEB maternity roost season of June 1 to July 31 (CMP 2020d), which would also reduce potential for effects on nesting Bicknell's thrush.

MDIFW does not anticipate significant impacts on any of the bat species as a result of the Proposed Project (MDIFW 2017). The Proposed Project would not affect any known maternity roosts or hibernacula for these species, but there is presumed occurrence of roosting bats in the northern hardwood and conifer forests consistent with areas found along the Proposed Project route (USACE 2020c: Page 73). The overarching threat to the listed species of myotis bats is the invasive fungus that is the causal agent for the White-Nose Syndrome ("WNS"), which is known to predominantly affect hibernating bats (USACE 2002c). The Proposed Project would not create any conditions which would alter (increase or decrease) the spread of WNS as the fungus is primarily spread from bat to bat within hibernacula; the Proposed Project would not change the dynamics of transmission within hibernacula.

The applicant has committed to avoiding construction activities within the 660-foot buffer of eagle nests during nesting seasonal restriction period between March 1 and August 31. No nests were observed

during 2020 surveys within a 660-foot buffer of the Proposed Project; therefore, no impacts to nesting eagles are expected (Burns & McDonnell 2020).

The applicant determined that the area identified as potentially providing habitat for northern bog lemming did not contain that species (MDEP 2020). This species is therefore not expected to be within the Proposed Project area and would not be affected by the Proposed Project.

State Sensitive Habitat

Coldwater Fisheries

The Proposed Project includes 583 crossings of rivers, streams, or brooks, of which 421 contain coldwater fisheries, including 237 coldwater fisheries habitat in Segment 1, 46 in Segment 2, and 138 in Segment 3 (MDEP 2020).

Potential impacts on coldwater fisheries from transmission projects include sedimentation and turbidity, introduction of pollutants, and locally increased stream insolation (exposure to sunlight). The Proposed Project has been designed to avoid and reduce these potential impacts on coldwater fisheries. There is no proposed instream activity for any stream, at any time, or at any location related to clearing activity, installation of transmission line structures, or substation site development. The Proposed Project has been designed and conditioned to manage vegetation in surrounding areas to reduce potential for any negative impacts to coldwater fisheries habitat. The applicant proposed to widen riparian buffers to 100 feet for all coldwater fishery streams (as determined by MDIFW), which include brook trout habitat. The applicant would allow vegetation to remain in place to the extent practicable and install appropriate sedimentation controls. Riparian Filter Area buffer strips would be maintained to reduce potential for sedimentation impacts on coldwater fisheries (CMP 2020c). A full summary of the avoidance measures and compensation are discussed in Section 3.4.3.2 of this EA.

MDEP determined that the applicant "has minimized impacts to waterbodies that serve as fisheries habitat to the greatest extent practicable, that the project will not unreasonably harm any aquatic habitat or fisheries, and that [CMP] has made adequate provision for the protection of fisheries, provided that [CMP implements provisions]" These provisions include conservation of the Grand Falls Tract, Basin Tract, and Lower Enchanted Tract, implementation of the vegetation management outlined in Appendix C of the Maine DEP Order, and funding of culvert replacements (MDEP 2020: Page 86).

Deer Wintering Area (DWA)

The Proposed Project route including Segments 1 through 5 crosses 22 DWAs resulting in a total of 83.5 acres of clearing, which includes 39.02 acres of impacts to the Upper Kennebec River DWA within Segment 1 (MDEP 2020: Page 87). Segments 1 through 3 contain ten DWAs resulting in a total of 53.9 acres of clearing in DWAs. None of the DWAs were rated by MDIFW as moderate or high value (MDEP 2020). Clearing of vegetation within DWAs would hinder the movement between and usage within DWAs, which could negatively affect wintering deer herds.

Although the DWAs in the Proposed Project area have not been rated by MDIFW as high or moderate value, credible witness testimony established the recent challenges for the deer population and the habitat value of these DWAs. The applicant agreed to offset impacts to the Upper Kennebec River DWA by providing 10 travel corridors within the DWA and conserving 717 acres of land within the DWA (MDEP 2020: Page 87).

MDEP determined that "These actions reduce wildlife impacts and promote the protection of wildlife generally, but especially deer, and will provide travel lanes for deer between available DWA habitat.

These measures, together with the conditions contained in this Order, ensure the Project will not unreasonably impact significant wildlife habitat" (MDEP 2020).

Significant Vernal Pools and Other Significant Wildlife Habitat

Inland Waterfowl and Wading Bird Habitats (IWWH)

The Proposed Project includes a total of 15.026 acres of impact to IWWH, which includes 0.017 acres of fill. MDEP determined that CMP "avoided and minimized Significant Wildlife Habitat [IWWH and SVP] impacts to the greatest extent practicable, and that, with the compensation that will be achieved through the In-Lieu Fee (ILF) payment, the Proposed Project represents the least environmentally damaging alternative that meets the overall purpose of the project, provided [that the applicant implements the in-lieu fee payment described in Section 3.4.2.3]" (MDEP 2020: Page 62). MDEP also determined that the Proposed Project "will not unreasonably harm or disturb any … Significant Wildlife Habitat, including high and moderate value [IWWH]" provided that CMP implements the avoidance flagging described in the VCP and VMP (MDEP 2020: 84).

Significant Vernal Pools (SVP)

Sixty-one SVPs would be impacted by the total project (Segments 1 through 5) considered in the MDEP Order, which consists of a total of 31.487 acres of impact to SVPs, including 1.46 acres of permanent fill, 27.57 acres of clearing in uplands, and 3.68 acres of clearing forested wetland (MDEP 2020: Page 82). Forty-eight SVPs would be impacted by the Proposed Project covered by this EA, including six in Segment 1, two in Segment 2, and 40 in Segment 3. The proposed new Merrill Road Converter Station would result in 0.273 acre of fill in an SVP (MDEP 2020: Page 6). MDEP determined that the applicant "avoided and minimized Significant Wildlife Habitat [IWWH and SVP] impacts to the greatest extent practicable, and that, with the compensation that will be achieved through the ILF payment, the Proposed Project represents the least environmentally damaging alternative that meets the overall purpose of the project, provided [that the applicant implements the in-lieu fee payment described in Section 3.4.2.3]" (MDEP 2020). MDEP also determined that the Proposed Project "will not unreasonably harm or disturb any significant vernal pool habitat… provided the applicant: Marks the location of all natural resource buffers with flagging prior to the start of construction; Permanently marks all natural resource buffers upon completion of construction; and Marks all natural resource buffers with flagging prior to any maintenance activities" (MDEP 2020: Page 84).

Migratory Birds and Raptors

Habitat for migratory birds and raptors would be permanently affected as a result of vegetation clearing. Vegetation impacts are detailed in Section 3.3, *Vegetation*. All migratory birds are protected by the Migratory Bird Treaty Act, which includes all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves, swifts, martins, swallows, and others. This impact would occur to birds nesting in the impact analysis area. Impacts from construction activities include disturbance of breeding birds, which may result in reduced breeding success, or destruction of nests and/or nesting habitat, in addition to those described for general wildlife. Other construction impacts would be similar to those described for general wildlife.

Long-term impacts on migratory birds and raptors from operation and maintenance would be similar to those described above under General Wildlife.

Wildlife Corridors

Segment 1 would involve the creation of a new transmission line corridor through a forested area, which although subject to timber management, would contribute to habitat fragmentation and have adverse impacts on wildlife as a result of the effects on wildlife travel lanes, lifecycles, and accessibility to

suitable and sufficient habitat. Fragmentation occurs when contiguous habitat is broken into smaller, more isolated patches. Transmission line corridors present potential impacts, as they may affect species movement, dispersal, density, nesting success and/or survival. Habitat conversion along transmission line corridors results in a loss of habitat types which, in turn, may adversely impact species that are reliant on the original habitat types. Negative results associated with fragmentation may include impacts on wildlife movement, reduction in accessible habitat, an increase in "edge" – the border between forest and an opening – and reduced interior, as well as biodiversity decline (MDEP 2020: Page 76).

MDEP determined that these measures, including maintaining taller softwood vegetation and maintaining full canopy height at Gold Brook and Mountain Brook crossings, are expected to reduce the impacts of the Segment 1 corridor but are not sufficient to avoid substantial and harmful fragmenting of habitat (MDEP 2020). The MDEP found that additional mitigation is required and that the applicant must take the steps described in Section 3.4.2.3, *Applicant Committed Measures*, with regard to tapering, taller poles and taller vegetation, and conservation.

MDEP determined that "The combination of vegetation management proposed by CMP and the additional requirements imposed as conditions of the MDEP Order, which include tapering and maintenance of taller vegetation, will reduce habitat impacts, provide wildlife sufficient ability to move between suitable habitats, regardless of where adjacent to the corridor this habitat changes as forestry patterns shift. Furthermore, the landscape-scale wildlife habitat impacts associated with fragmentation that will occur, even with this vegetation management, will not be unreasonable, given that they will be mitigated and offset through the required additional conservation within the western Maine forest area in which Segment 1 is located. Provided the applicant implements these measures, the Department finds that the project will result in adequate provision for the protection of wildlife" (MDEP 2020: Page 76).

3.4.2.3 Applicant Committed Measures

Specific means to reduce impacts were proposed by the applicant. These included proposing to use 100-foot tall steel poles that can be placed farther apart than typical H-Frame structures, site-specific adjustments to structure locations, use and location of temporary roads, and substation design. The proposed use of taller structures reduces the number of poles that need to be placed, the amount of temporary construction road that would need to be created, and the number of poles located in wetlands. Other procedures the applicant proposed to reduce impacts included implementation of Environmental Guidelines (CMP 2018b), which include erosion and sedimentation control measures, pre-construction wildlife surveys, time of year restrictions on certain construction activities, and the use of third-party inspectors.

The USACE Section 404 Permit (USACE 2020b), MDEP Order (MDEP 2020), and Maine Site Law Certification (SLC) SLC-9 (Maine LUPC 2020) have been issued. The permit and certification contain numerous binding conditions that protect surface water and wetlands. Those measures are incorporated here by reference. Summary of Compensation Tables that cover Segments 1 through 5, were included as Exhibit L of the Final BA (USACE 2020c) and follow as Table 3.4-1 through Table 3.4-3. Relevant discussion summaries of the measures are presented below.

Table 3.4-1. Summary of Impacts and Compensation as Required by Natural Resources Protection Act Permit Requirements and/or USACE Permit Requirements

Resource Type & Impact	Agency Requiring	Form of Compensation	Type and Amount of Compensation
47.6 acres of Temporary Wetland Fill	Corps	Preservation and In-Lieu Fee	Preservation of 56.97 acres of wetlands (see Table below for details). $154,369.29
105.25 acres of Permanent Cover Type Conversion of Forested Wetlands[1]	Corps and MDEP	Preservation	Preservation of three parcels (Little Jimmie Pond, Flagstaff Lake and Pooler Pond Tracts), containing 439.41 acres of wetlands (see Table below for details).
3.814 acres of Permanent Fill in Wetlands of Special Significance (WOSS)[2]			
0.307 acres of Permanent Fill in Wetland (Non-WOSS)			
0.743 acres of Permanent Wetland Fill in SVP Habitat	MDEP	In-Lieu Fee	$623,657.53
3.678 acres of Permanent Forested Wetland Conversion in SVPH			
0.719 acres of Permanent Upland Fill in SVP Habitat			
27.572 acres of Permanent Upland Conversion in SVPH			
Direct and Indirect Impact to Corps Jurisdictional Vernal Pools	Corps	In-Lieu Fee	$2,015,269.01
0.003 acres of Permanent Wetland Fill in IWWH	MDEP	In-Lieu Fee	$253,352.53
2.622 acres of Permanent Forested Wetland Conversion in IWWH			
0.014 acres of Permanent Upland Fill in IWWH			
12.387 acres of Permanent Upland Conversion in IWWH			
	In-Lieu Fee		$3,046,648.37
	Land Preservation See Table below for Details		1,022.4 acres of preservation containing 510.75 acres of wetland.

[1]The Corps requires compensation for Permanent Cover Type Conversion of Forested Wetlands. The MDEP requires compensation for Permanent Cover Type Conversion of significant wildlife habitat. Compensation for wetlands within significant wildlife habitat, IWWH, and SVPH are not included within the Permanent Cover Type Conversion of Forested Wetlands calculation and are calculated separately within their respective categories. Cover type conversion within upland areas of IWWH and SVPH are compensated separately as well.

[2]Permanent fill in WOSS excludes fill in IWWH and SVPH, which are calculated separately, in their respective categories

Source: MDEP 2020: Appendix F.

Table 3.4-2. Preservation Parcels Proposed for Wetland Mitigation and Considerations under the USACE General Compensatory Mitigation Requirements

Parcel Name	Little-Jimmie Pond Tract	Flagstaff Lake Tract	Pooler Pond Tract
Town/Township	Manchester	Carrying Place & Dead River Townships	The Forks Plantation
County	Kennebec	Somerset	Somerset
Coordinates of Site Centroid (Lat/Long WGS 84):	44°16'18.21"N, 69°52'23.75"W	45°11'11.48"N, 70°9'42.41"W	45°17'25.16"N, 69°59'28.86"W
Biophysical Region	Central Interior	Western Mountains	Central Mountains
Watershed (HUC 8)	HUC 0103003	HUC 0103003	HUC 0103003
Closest NECEC Segment in associated HUC 8 Watershed	Segment 3	Segment 1	Segment 1
Total Parcel Acreage	109.77	831.39	81.24
Delineated Wetland Acreage	68.08	423.96	18.33
Considerations under the General Compensatory Mitigation Requirements (33 CFR 332.3 (h))			
Resources to be preserved provide important physical, chemical, or biological function for the watershed (Yes/No);	Yes	Yes	Yes
Resources to be preserved contribute significantly to the ecological sustainability of the watershed (Yes/No)	Yes	Yes	Yes
Preservation is determined by the district engineer to be appropriate and practicable (Yes/No);	Yes	Yes	Yes
Resources are under threat of destruction or adverse modifications (Yes/No); and	Yes	Yes	Yes
Site will be permanently protected through an appropriate real estate or other legal instrument (Yes/No).	Yes	Yes	Yes

Source: MDEP 2020: Appendix F.

Table 3.4-3. Summary of Impacts and Compensation Resulting from Consultation with Resource Agencies

Resource Type & Impact	Agency Requiring	Form of Compensation	Amount of Compensation
9.229 acres of forested conversion in Unique Natural Communities	MNAP	Fee Contribution to Maine Natural Areas Conservation Fund	$1,224,526.82
Forested conversion to the Goldie's Wood Fern	MNAP	Funding for rare plant surveys to the Maine Natural Areas Conservation Fund	$10,000
26.416 acres of forest conversion in Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas	MDIFW	Fee Contribution to Maine Endangered and Nongame Wildlife Fund	$469,771.95
39.209 acres of forest conversion in the Upper Kennebec Deer Wintering Area	MDIFW	Preservation	Seven parcels, totaling 717 acres of land in the Upper Kennebec DWA
11.02 linear miles of forested conversion in riparian buffers	MDEP and MDIFW	Preservation	Three preservation parcels, (Basin Tract, Lower Enchanted Tract and Grand Falls Tract) totaling 1053.5 acres, containing 12.02 linear miles of stream
		Fee contribution to Maine Endangered and Nongame Wildlife Fund	$180,000
		Funding for Culvert Replacements	$1,875,000
Impact to Outstanding River Segments	MDEP	Preservation	Three preservation parcels, (Basin Tract, Lower Enchanted Tract, and Grand Falls Tract) offering 7.9 miles of frontage on the Dead River, an Outstanding River Segment
Habitat fragmentation and impacts to wildlife movement	MDEP	Conservation	Conservation of 40,000 in the vicinity of Segment 1
	Total Additional Monetary Contribution		$3,759,298.77
	Total Additional Land Preservation/Conservation		41,770.5 Acres

Source: MDEP 2020: Appendix F.

Federally Listed Species

Atlantic Salmon

The applicant would apply a 100-foot riparian buffer to all perennial streams in Segment 1, all streams west of Moxie Pond in Segment 2, all project-wide coldwater fishery habitats, outstanding river segments, waterbodies containing listed species (e.g., Atlantic Salmon), and all streams within the GOM DPS, which also includes the Atlantic salmon critical habitat. The BA also includes procedures for avoiding or minimize effects to Atlantic salmon and its listed Critical Habitat (USACE 2020c). The applicant proposed a Culvert Replacement Program as part of the NECEC Project Compensation Plan, which would enhance coldwater fishery habitat through the removal and/or replacement of non-functional, damaged, undersized, and improperly installed culverts in the vicinity of Segments 1 and 2; however, no culvert replacements would occur in existing Atlantic salmon streams or designated critical habitat.

The USFWS verified that based on the Information, Planning, and Consultation System (IPaC) submission, the Proposed Project is consistent with activities analyzed in the USFWS' January 5, 2016, Programmatic Biological Opinion (PBO) for Northern long-eared bat (USFWS 2020b). The Proposed Project may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR Section 17.40(o). Compensation detailed in Figures 3.4-1 through 3.4-3 provide compensation for potential impacts on forest habitat for sensitive bats.

Canada Lynx

As required by the MDEP Order issued to the applicant on May 11, 2020, the applicant has reduced the clearing width in Segment 1 from 150 feet to 54 feet for approximately 39 miles, with taller tapered vegetation to 48 feet beyond the 54-foot width. Segment 1 would also include 12 Wildlife Management Areas within 14.08 miles that would be maintained with taller vegetation in accordance with Table C-1 of Appendix C of the MDEP Order (MDEP 2020: Table C-1). As a result, approximately 698 acres in the Proposed Project corridor in Segment 1 would be managed in a tapered configuration or selectively cut in order to minimize wildlife and critical habitat impacts (USACE 2020c: Page 111).

Northern Long-eared Bat

As a conservation effort to protect the Northern Long-eared Bat, the applicant would suspend initial tree clearing activities during the maternity roost season of June 1 to July 31 (CMP 2020d). The applicant would suspend vegetation maintenance activities for trees greater than 3 inches diameter at breast height during the maternity roost season of June 1 to July 31 (CMP 2020c).

State-listed Species

The MDEP Order (MDEP 2020) includes standard conditions of approval, as well as additional conditions to protect resources and compensate for impacts. Applicable conditions are summarized below.

The compensation package summarized in Table 3.4-1 through Table 3.4-3 would provide protected habitat for brook floater mussel, Bicknell's thrush, sensitive bat species, and other state sensitive animals. The applicant has also committed to contribute $180,000 to Maine's Endangered and Nongame Wildlife Fund for impacts associated with 11.02 miles of forested conversion in riparian buffers (MDEP 2020: Table F-2).

Wood Turtle

To avoid potential for impacts on wood turtles, construction activities would be limited to between October 15 and April 15 within the 16 mapped wood turtle habitats within the construction area (MDEP 2020: Page 63).

Rusty Blackbird

To avoid potential for impacts to rusty blackbirds, MDIFW recommended no construction activities in the mapped habitat between April 20 and June 30. MDIFW also recommended that a 10 to 15-foot-high dense stand of spruce and fir be left in the rusty blackbird habitat, which is located in Parlin Pond Twp. and Johnson Mountain Twp.

Roaring Brook Mayflies and Northern Spring Salamanders

The applicant proposed utilization of taller poles near Gold Brook and Mountain Brook, which would allow full canopy height vegetation over these streams to minimize the impact to Roaring Brook Mayflies and Northern Spring Salamanders. The applicant proposed to contribute $469,771.95 to Maine's Endangered and Nongame Wildlife Fund for impacts on 26.416 acres of forest conversion in NSS and RBM Conservation Management Areas (MDEP 2020: Table F-2).

Great Blue Heron

The applicant would complete a survey for Great Blue Heron colonies within or immediately adjacent to existing IWWH between prior to initial transmission line clearing; if any colonies are identified, the applicant would consult with MDIFW and obtain approval from the Department prior to construction in the vicinity of any colony (MDEP 2020).

The compensation package summarized in Table 3.4-1 through Table 3.4-3 would provide protected habitat for brook floater mussel, Bicknell's thrush, sensitive bat species, and other state sensitive animals. The applicant has also committed to contribute $180,000 to Maine's Endangered and Nongame Wildlife Fund for impacts associated with 11.02 miles of forested conversion in riparian buffers (MDEP 2020: Table F-2).

State Sensitive Habitat Area

Coldwater Fisheries

The Proposed Project includes various measures to reduce potential for sedimentation, pollution, or other impacts into coldwater fisheries (brook trout habitat) through vegetation management practices. These measures were developed by the applicant and have been memorialized in the MDEP Order (MDEP 2020) and the USACE Section 404 Permit Special Conditions (USACE 2020b). Summaries of these avoidance measures are presented below.

The VCP and VMP (CMP 2020c, CMP 2020d) specify that the applicant would maintain a 100-foot riparian filter area around all perennial streams in Segment 1 and all coldwater fisheries streams in the other segments, and would maintain successional and tapered vegetation within the remainder of Segment 1. No herbicides would be used within riparian filter areas, or anywhere within Segment 1, to prevent potential for herbicides to enter waterways. The applicant would leave cut trees during operations and maintenance to provide for large woody debris inputs into streams for fisheries habitat enhancement. The applicant would conduct pre-construction inspections and mark locations of natural resource buffers in the field to prevent inadvertent construction or maintenance impacts on sensitive resources, including coldwater fisheries. The applicant would implement enhanced erosion and sediment control measures in areas at a high risk of erosion. The applicant would inspect and clean equipment to prevent the spread of

invasive organisms into or within the Proposed Project area. The applicant would use crane mats or other means for spanning streams, and any crossing or disturbed wetlands would be restored to pre-construction conditions. No temporary fill would be placed in waters unless specifically authorized by the Section 404 Permit (USACE 2020b).

The MDEP Order identifies that the Compensation Package include compensation for unavoidable impacts to coldwater fisheries in the form of (a) land preservation (b) funding to improve fish passage by providing $1,875,000 for replacement of culverts and (c) providing $180,000 for compensation for the conversion of forested riparian habitat (Table 3.4-3) (MDEP 2020: Table F-2). The applicant has prepared a Culvert Replacement Program "to address missing, non-functional, damaged, undersized, and improperly installed culverts as mitigation for indirect impacts to coldwater fisheries" (USACE 2020b). This plan includes the replacement or removal of all culverts deemed to be barriers to fish passage on applicant-controlled lands associated with Segments 1 and 2. The applicant would dedicate $1,875,000 for replacement of 20-35 culverts on lands outside of the applicant's ownership (MDEP 2020: Page 86).

CMP has committed to preserve the Grand Falls Tract, Basin Tract, and Lower Enchanted Tract, which contain a total of 12.02 miles of streams including coldwater fisheries habitat (MDEP 2020: Table F-2). The applicant also committed to the conservation of 40,000 acres for impacts to habitat fragmentation. These 40,000 acres would presumably contain additional coldwater fisheries habitat given the abundance of this resource in the vicinity of Segment 1 (MDEP 2020: Page 81).

Deer Wintering Area

The VMP (CMP 2020b) details vegetation management for 10 travel corridors in the Upper Kennebec River DWA to promote winter movement of deer in these areas. Eight of the travel corridors would be created by selectively cutting the corridor to promote softwood growth necessary to provide winter habitat for deer. Two of these corridors would be adjacent to the Upper Kennebec River in the area where the transmission line would be underground, allowing maintenance of full height vegetation. The compensation package for the Proposed Project includes the preservation of 717 acres of land in the Upper Kennebec River DWA (MDEP 2020: Page 109).

Significant Vernal Pools and Other Significant Wildlife Habitat

Significant Vernal Pools (SVP)

The VCP and VMP (CMP 2020c, CMP 2020d) establish measures to minimize potential for significant effects on significant wildlife habitat including SVPs. These measures include flagging avoidances zones prior to construction or maintenance; restrictions on when initial clearing in SVP habitat may be conducted; and prohibitions against using mechanized equipment between April 1 and June 30.

The applicant has committed to submitting an In-Lieu Fee payment to MDEP for the Maine Natural Resources Conservation Program in the amount of $623,657.53 prior to the start of construction (Table 3.4-1) (MDEP 2020: Table F-1).

Inland Waterfowl and Wading Bird Habitats (IWWH)

To reduce potential for impacts on IWWH, prior to initial transmission line clearing and between April 20 and May 31, the applicant would complete surveys for heron colonies within or immediately adjacent to (i.e., within 75-feet) existing IWWH's within the Proposed Project area. If colonies are discovered, the applicant would notify and consult with MDIFW biologists.

The VCP and VMP (CMP 2020c, CMP 2020d) establish measures to minimize potential for significant effects on IWWH including flagging avoidance zones prior to constructions or maintenance; restrictions

on herbicide usage; prohibition on mechanized equipment from within IWWH between April 15 and July 15; and guidance for retaining some naturally occurring snags within IWWH.

MDEP is requiring in-lieu fee payment of $253,352.53 as compensation for 0.003 acre of permanent wetland fill in IWWH, 2.622 acres of Permanent Forested Wetland Conversion in IWWH, 0.014 acre of permanent forested wetland conversion in IWWH, and 12.387 acres of permanent upland conversion in IWWH (MDEP 2020: Table F-1).

Wildlife Corridors

The applicant would take steps with tapering, taller poles and taller vegetation, and conservation to substantially reduce the effects on wildlife (MDEP 2020). These steps are also detailed in Appendix C of the MDEP Order (MDEP 2020) and the VCP and VMP (CMP 2020c, CMP 2020d) and are incorporated here by reference. Summaries of these steps are presented below.

Tapering

A tapered corridor includes an approximately 54-foot wide area under the conductors (the wire zone) that would be cleared during construction and maintained as scrub-shrub habitat during operation of the Proposed Project. Outside the wire zone, which is located at the center of the 150-foot wide corridor, taller vegetation would be maintained. This taller vegetation would increase from 15 to 35 feet in height as the distance from the wires zone towards the outside of the corridor increases.

Taller Poles and Vegetation

Taller poles can allow for taller vegetation under the conductors. Additionally, in some locations, taller vegetation may be feasible under the corridors simply as a result of taking advantage of existing topography. The applicant and MDEP developed locations where taller vegetation could be maintained to protect and encourage wildlife movement (MDEP 2020: Page 87).

- Maintaining taller, softwood vegetation in eight designated areas in the Upper Kennebec River DWA to provide travel corridors for deer.

- Maintaining full canopy height vegetation at the Gold Brook and Mountain Brook crossings. While the primary purpose of maintaining taller vegetation within the corridor in these locations is the protection of Roaring Brook Mayfly and Northern Spring Salamander habitat, the taller vegetation also helps minimize the fragmenting effect of the corridor.

- Maintaining tapered vegetation along the entire Segment 1 corridor, except where full canopy height vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors is required.

- Expanding the riparian filter areas on cold water fisheries streams to 100 feet, and on all other streams to 75 feet.

Conservation

The MDEP Order (MDEP 2020) determined that because of impacts on wildlife, even with on-site mitigation, that off-site mitigation in the form of land conservation is required to ensure the applicant has made adequate provision for the protection of wildlife in the region affected by the Proposed Project. MDEP determined that conservation of 40,000 acres was reasonable and appropriate here to ensure the applicant has made adequate provision for the protection of wildlife, including mitigation for habitat fragmentation impacts. The MDEP Order specifies that within 18 months of the issuance, the applicant

must develop and submit a Conservation Plan to the MDEP to permanently conserve 40,000 acres in the vicinity of Segment 1 (MDEP 2020: Page 81). The primary goal of the Conservation Plan is the compensation for the fragmenting effect of the transmission line on habitat in the region of Segment 1 and the related edge effect by promoting habitat connectivity and conservation of mature forest area (MDEP 2020).

3.5 Water Resources and Quality

3.5.1 Affected Environment

The water resources affected environment is described in two analysis areas. The first analysis area is a high-level area that consists of the watersheds in which the Proposed Project is located. This is generally described in the *Streams* section below. A second analysis area that is more specific to the immediate Proposed Project location is the area that was established for the wetlands and surface waters delineation field work; this consists of a 500-foot wide corridor along Segment 1, a 300-400-foot-wide corridor along Segments 2 and 3 (depending on width of existing ROW), and the locations of the substations. The second analysis area is where water resources are quantified.

The following summarizes the methods for identifying, describing, and quantifying water resources in the analysis area.

- Surface waters and wetlands are described based on data collected by the applicant during field surveys conducted in the analysis area. These field surveys were completed during the 2015, 2016, and 2017 field seasons (CMP 2017a). Segments 1, 2, and 3 were surveyed on foot by professional wetland scientists to identify and map all wetlands and surface waters. Wetland delineations were completed pursuant to the 1987 USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (USACE 2011). The proposed station and substation locations were also surveyed for the presence of wetlands and surface waters. All wetlands were classified using the USFWS classification system (Cowardin et al. 1979). Wetlands were also classified as either wetlands that are not of special significance or as Wetlands of Special Significance (WOSS), as defined in Maine Department of Environmental Protection Regulation Chapter 310.4.

- Surface water quality in the analysis area is described using Maine's 303(d) list of impaired waters (MDEP 2018).

- Floodplains in the analysis area are described using Federal Emergency Management Agency (FEMA) flood hazard data (FEMA 2020).

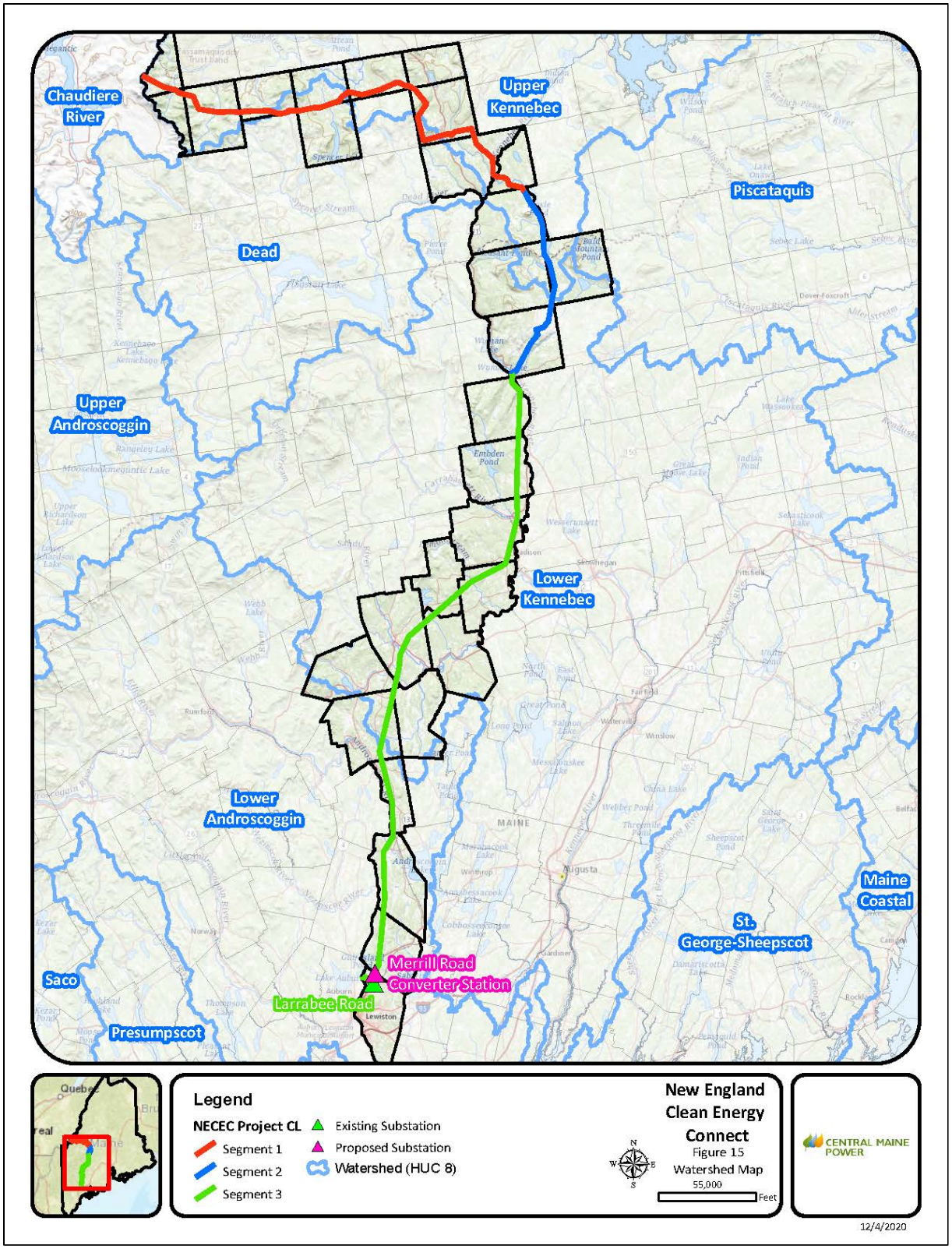
- Groundwater is described using available agency groundwater information for the analysis area, including information on Maine Geological Survey-mapped Significant Sand and Gravel Aquifers (Maine Geological Survey 2020b).

3.5.1.1 Surface Water

Streams

The Proposed Project is located within the Kennebec River and Androscoggin River watersheds (USGS 2019). The Kennebec River watershed is approximately 5,900 square miles (mi^2) in area and is located entirely within the State of Maine. The Androscoggin River Watershed is approximately 3,530 mi^2 in area

and spans part of Maine and part of New Hampshire. Within these two watersheds are four sub-watersheds (i.e., Hydrologic Unit Code (HUC) 8) where the Proposed Project is located, including the Upper Kennebec River Watershed (1,570 mi^2) (Segment 1 and Segment 2); Dead River Watershed (878 mi^2) (Segment 1), Lower Kennebec River Watershed (3,450 mi^2) (Segment 2 and Segment 3), and Lower Androscoggin River Watershed (2,060 mi^2) (Segment 3) (Figure 3.5-1). All surface waters in the sub-watersheds flow either to the Kennebec River or Androscoggin River, both of which flow to Merrymeeting Bay. Waters in Merrymeeting Bay eventually empty into the Gulf of Maine on the Atlantic Ocean.



Source: CMP, December 2020.

Figure 3.5-1. Sub-Watersheds (HUC 8) of the Proposed Project

Surface waters identified during field delineations include numerous perennial and intermittent streams. Perennial streams typically have year-round water flow, where most of the water comes from smaller upstream waters or groundwater, whereas runoff from rainfall or other precipitation is supplemental. Intermittent streams flow during certain times of the year when smaller upstream waters are flowing and when groundwater provides enough water for stream flow. Runoff and other precipitation supplements the flow of intermittent streams, and during dry periods, intermittent streams may not have flowing water. Perennial and intermittent streams provide many upstream and downstream benefits; they protect against floods, filter pollutants, recycle potentially harmful nutrients, and provide food and habitat for many types of fish and other aquatic organisms. Streams also play a critical role in maintaining the quality and supply of drinking water, ensuring a continual flow of water to other surface waters, and help recharge groundwater (USEPA 2013).

A total of 600 streams were identified in the analysis area for the three segments, including 297 streams along Segment 1, 70 streams along Segment 2, and 233 streams along Segment 3. Sixty-six percent of all streams identified are intermittent, with the vast majority of these intermittent streams generally 5 feet average width or less. Larger streams in the analysis area include the Kennebec River (100 feet wide) along Segment 1; Chase Stream (30 feet wide) along Segment 2; and the Carrabasset River (400 feet wide) and Gilbert Brook (190 feet wide) along Segment 3. All streams were considered jurisdictional under the Clean Water Act (i.e., waters of the United States). Streams in the analysis area are shown in the NECEC Natural Resources Maps (CMP 2020t).

At the proposed new Merrill Road Converter Station, one small intermittent stream was identified that flows through the corner of the analysis area. No streams were identified at the Larrabee Substation expansion area.

Wetlands

Wetlands are important features in the landscape that provide numerous beneficial services for people and for fish and wildlife. Some of these services, or functions, include protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters, producing aesthetic value, ensuring biological productivity, filtering pollutant loads, and maintaining surface water flow during dry periods. These functions are the result of the inherent and unique natural characteristics of wetlands.

Wetland functions can also reflect a measurable value to society. For example, a value can be determined by the revenue generated from the sale of fish that depend on the wetland, by the tourist dollars associated with the wetland, or by public support for protecting fish and wildlife. Although large-scale benefits of functions can be valued, determining the value of an individual wetland is difficult because wetlands differ widely and do not all perform the same functions or perform functions equally well (USEPA 2001).

The wetland field delineation identified several hundred wetlands totaling just over 1,000 acres in the analysis area of the three segments, and just over two acres of wetland at a station location. All wetlands were considered jurisdictional under the Clean Water Act (i.e., waters of the United States). Wetlands in the analysis area are shown in the NECEC Natural Resources Maps (CMP 2020t).

Segment 1

Four hundred and eighty-five wetlands totaling 205.48 acres were delineated within the Segment 1 transmission line analysis area, as summarized in Table 3.5-1 (CMP December 2020). These wetlands receive sustaining hydrology from a high groundwater table, seepage, surface runoff from adjacent uplands, or inputs from adjacent waterbodies. Functions and values provided by wetlands within Segment 1 generally include groundwater recharge/discharge, nutrient removal, sediment/shoreline stabilization,

and sediment retention with many of the wetlands providing wildlife habitat. One hundred and seventy-five wetlands were identified as WOSS.

Table 3.5-1. Number of Wetlands in Segment 1 Analysis Area

Cowardin Class	Non-WOSS	WOSS	Total
PEM	98	37	135
PSS	53	30	83
PFO	153	101	254
POW	0	1	1
PUB	1	0	1
PEM/PSS	0	2	2
PEM/POW	1	0	1
PSS/PEM	0	1	1
PSS/PFO	1	0	1
PFO/PSS	1	0	1
POW/PSS	0	1	1
Unknown	2	2	4
Subtotal	310	175	485

Source: CMP December 2020
P=palustrine, EM=emergent, SS=scrub/shrub, FO=forested, OW=open water, UB=unconsolidated bottom, WOSS=wetlands of special significance, Unknown = the wetland delineation data form did not include a national wetland inventory (NWI) classification for these wetlands.

Segment 2

One hundred and forty-seven wetlands totaling 175.71 acres were delineated within the Segment 2 transmission line corridor, as summarized in Table 3.5-2 (CMP December 2020). These wetlands receive sustaining hydrology from a high groundwater table, seepage, surface runoff from adjacent uplands, or inputs from adjacent waterbodies. Functions and values provided by wetlands within Segment 2 generally include groundwater recharge/discharge, sediment/shoreline stabilization, flood flow alteration, wildlife habitat, and sediment retention. Fifty-four wetlands were identified as WOSS.

Table 3.5-2. Number of Wetlands in Segment 2 Analysis Area

Cowardin Class	Non-WOSS	WOSS	Total
PEM	30	20	50
PSS	7	5	12
PFO	19	6	25
PEM/PFO	23	11	34
PEM/PSS	6	4	10
PFO/PSS/PEM	1	2	3
PFO/PSS	4	3	7
POW/PFO	2	0	2
Unknown	1	3	4
Subtotal	93	54	147

Source: CMP December 2020
P=palustrine, EM=emergent, SS=scrub/shrub, FO=forested, OW=open water, WOSS=wetlands of special significance, Unknown = the wetland delineation data form did not include a national wetland inventory (NWI) classification for these wetlands.

Segment 3

Four hundred ninety-five wetlands totaling 667.86 acres were delineated within the Segment 3 transmission line corridor, as summarized in Table 3.5-3 (CMP December 2020). These wetlands receive sustaining hydrology from a high groundwater table, seepage, surface runoff from adjacent uplands, or inputs from adjacent waterbodies. Functions and values provided by wetlands within Segment 3 generally

include groundwater recharge/discharge, sediment/shoreline stabilization, flood flow alteration, nutrient removal, and sediment retention, with many of the wetlands providing wildlife habitat. Two hundred twenty-three wetlands were identified as WOSS.

Table 3.5-3. Number of Wetlands in Segment 3 Analysis Area

Cowardin Class	Non-WOSS	WOSS	Total
PEM	68	55	123
PSS	91	77	168
PFO	100	80	180
PEM/PSS	1	1	2
PEM/PFO	3	1	4
PSS/PFO	2	1	3
PSS/PFO/PEM	1	1	2
PFO/PEM	2	3	5
PFO/PSS	2	1	3
POW	0	1	1
PUB	0	2	2
PUB/PFO	1	0	1
PUB/PSS	1	0	1
Subtotal	272	223	495

Source: CMP December 2020
P=palustrine, EM=emergent, SS=scrub/shrub, FO=forested, OW=open water, UB=unconsolidated bottom, WOSS=wetlands of special significance

Substations

Three wetlands totaling 19.99 acres were delineated within the analysis area of the proposed new Merrill Road Converter Station (CMP December 2020, CMP 2017a). Two wetlands are palustrine forested (PFO) wetlands and one is palustrine emergent/palustrine scrub/shrub (PEM/PSS) wetland. These wetlands receive sustaining hydrology primarily from a high groundwater table or seepage and, in some cases, they are associated with small, ephemeral drainages. No wetlands were delineated at the Larrabee Substation proposed expansion area.

Floodplains

Floodplains are defined as any land area susceptible to being inundated by waters from any source (44 CFR Part 59.1) and are often associated with surface waters and wetlands. Floodplains are valued for their natural flood and erosion control, enhancement of biological productivity, and socioeconomic benefits and functions. However, floodplains can be considered a hazardous area because buildings, structures, and properties located in floodplains can be inundated and damaged during floods.

Floodplains that are relatively undisturbed (or have been restored to a nearly natural state) provide a wide range of benefits to both human and natural systems. The Federal Interagency Floodplain Management Task Force (1994) groups these potential benefits into three categories—water resources, biological resources, and societal resources—labeled according to the primary recipient of the benefit or its relationship to a larger system. Table 3.5-4 lists these benefits in the context of water resources.

Table 3.5-4. Potential Water Resources Benefits of Floodplains

Water Resources		
Natural Flood & Erosion Control	Water Quality Maintenance	Groundwater Recharge
• Provide flood storage and conveyance	• Filter nutrients and impurities from runoff	• Promote infiltration and aquifer recharge
• Reduce flood velocities	• Process organic wastes	• Reduce frequency and duration of low surface flows
• Reduce flood peaks	• Moderate temperature fluctuations	
• Reduce sedimentation		

Source: Federal Interagency Management Task Force 1994.

FEMA-mapped floodplain data shows several 100-year floodplains in the analysis area along Segments 2 and 3, totaling 9.2 acres along Segment 2 and 132.9 acres along Segment 3; no 100-year floodplains are mapped in the Segment 1 analysis area. The 100-year floodplain is defined as the area that will be inundated by a flood event having a 1-percent chance of being equaled or exceeded in any given year. The 100-year floodplain is also identified by FEMA as the Special Flood Hazard Area on FEMA Flood Insurance Rate Maps (FIRMs), where these areas are identified as Zone A. Flood zones are areas that FEMA has defined according to varying levels of flood risk. Encroachment on flood zones can reduce the normal overflow storage and conveyance area, resulting in backing up floodwaters that can affect adjacent areas by displacing floodwaters into areas not typically subject to flooding.

FEMA-mapped floodway data shows eight floodways in the Segment 3 analysis area, totaling 30.6 acres; no floodways are mapped in the Segment 1 or 2 analysis areas. A floodway is the channel of a river or other watercourse with adjacent land areas that must be reserved in order to discharge the 100-year flood (or base flood) without cumulatively increasing water surface elevation more than a designated height. Development in floodways must not result in increases in upstream flood elevations. The eight floodways in the analysis area are associated with Clay Brook, Dead River, Redwater Brook, Allen Stream, Wilson Stream, Carrabasset River, Cascade Brook, and Sandy River.

FEMA also maps areas with a 0.2 percent annual change of flooding, which are also known as 500-year floodplains. FEMA floodplain management regulations under the National Flood Insurance Program do not apply to 500-year floodplains, but these mapped areas provide additional information on flood prone areas in the analysis area. FEMA-mapped floodplain data show 9.8 acres of 500-year floodplain mapped in the Segment 3 analysis area but excludes the substations; no 500-year floodplains are mapped in the Segment 1 or 2 analysis areas.

In addition to FEMA-mapped floodplains, unmapped floodplains associated with smaller ephemeral and intermittent streams may exist in the analysis area. These unmapped floodplains are generally small and are immediately adjacent to each stream. Inundation of these floodplains is typically associated with large rainstorms. Because each stream's drainage basin is small, rainstorms that cause flooding are localized to the immediate area around the streams. Flooding adjacent to these streams would likely be of short duration because of the high permeability of the streambed material.

FEMA-mapped 100-year floodplains, 500-year floodplains, and floodways are shown on the FEMA floodplain map set in Appendix C *Water Resources and Quality*.

3.5.1.2 Groundwater

Subsurface water that fills the spaces between particles of rock and soil is called groundwater. An aquifer is a water-bearing geologic formation capable of yielding a usable amount of ground water to a well. There are two types of aquifers in Maine: surficial materials and fractured bedrock. In unconsolidated surficial deposits, the water fills the pore spaces between the rock fragments that make up the deposits.

Coarse-grained surficial materials such as sand and gravel are capable of transmitting large quantities of groundwater and are generally the most productive groundwater resources in Maine. The Maine Geological Survey has identified and mapped important groundwater areas called Significant Sand and Gravel Aquifers, which are aquifers of sand and gravel deposits that are usable for groundwater supply (e.g., municipal, industrial, or residential use) and where groundwater yield is estimated to be 10 gallons per minute or greater. Knowing the presence of these aquifers in a project area is important to ensure that potential impacts from development activities avoid or minimize potential impacts on groundwater in these aquifers.

A total of 28 Significant Sand and Gravel Aquifers totaling 420.45 acres are mapped within the transmission line analysis area, including six aquifers (71.7 acres) along Segment 1, three aquifers (55.4 acres) along Segment 2, and 19 aquifers (293.36 acres) along Segment 3 (CMP December 2020).

No Significant Sand and Gravel Aquifers are located at the new and expanded substation sites. One Significant Sand and Gravel Aquifer overlaps the existing Larrabee Road Substation footprint but not the proposed expanded 0.08-acre area.

3.5.1.3 Water Quality

Existing surface water quality conditions in the study are described using Maine's integrated water quality reports that list 303(d) impaired waters (MDEP 2018). Section 303(d) of the Clean Water Act (CWA) requires states to identify surface waters where pollution control measures are not stringent enough to maintain water quality standards for the designated uses. Surface waters where water quality standards are not met and where designated uses are not supported are listed as impaired on the 303(d) list for the state. Designated uses of freshwater surface waters in Maine are identified as: drinking water supply, aquatic life use support, fishing/fish consumption, recreation, navigation, hydropower, and agriculture/industrial supply.

One surface water in the analysis area is listed is 303(d) impaired—Sandy River. A 3.24-mile segment of the river is listed as impaired from the Farmington Wastewater Treatment Plant and 2.4-miles downstream. The Segment 3 crosses the river within this river segment approximately 0.85-mile downstream from the Farmington Wastewater Treatment Plant. The designated water use impaired in the river is aquatic life use support, with the causes listed as low dissolved oxygen and benthic-macroinvertebrate non-attainment.

3.5.2 Environmental Consequences

3.5.2.1 Impact Analysis Area and Indicators

The impact analysis area for impacts on water resources and quality is the Proposed Project footprint and the HUC 8 sub-watersheds.

Impact indicators for water resources and quality include the potential for change in water quantity or quality. The following indicators were considered when analyzing impacts on water resources and quality:

- Surface Water
    - Qualitative assessment of the effects on any perennial and intermittent streams, including discharge of stormwater runoff

- Qualitative assessment of the potential for accidental or intentional release of contaminants to surface waters

- Wetland Resources
  - Acreage of wetlands for which disturbance would be unavoidable

- Floodplains
  - Acreage of floodplain and floodway disturbance
  - Presence of any permanent physical structures within floodplains and floodways

- Groundwater
  - Infiltration/recharge and groundwater quality disturbance to aquifers, including sensitive aquifers, such as Significant Sand and Gravel Aquifers

- Water Quality
  - Number and type of waterbodies that occur within the ROW with special management designation and restrictions (i.e., 303(d) impaired waters) that would be affected
  - Qualitative assessment of the effects on any specially designated waters (i.e., 303(d) impaired waters)

3.5.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Surface Water

Streams

The Proposed Project would cross 600 streams, but there would be no permanent impacts on these streams because no fill, transmission line structures, or any other project-related structures would be permanently placed in streams. All transmission line structures are sited to avoid streams, with the transmission line crossing over streams or under via HDD (i.e., Kennebec River). A total of 192 streams would have temporary crossings for movement of construction equipment, including 104 crossings along Segment 1, 25 crossings along Segment 2, and 63 crossings along Segment 3 (CMP December 2020). Potential impacts on streams include sedimentation and turbidity, locally increased stream insolation (exposure to sunlight, increased temperature, and diminished woody debris contributions) associated with clearing, and introduction of pollutants.

Use of construction and maintenance vehicles and equipment can loosen and expose bare soils and increase the potential for sediment particles to be mobilized and carried in overland runoff to nearby streams, affecting water quality and aquatic habitat. Sediment deposition into surface waters can increase turbidity, which can affect aquatic species and habitats. Turbidity can decrease light penetration and increase pollutant and nutrient levels (e.g., nitrogen and phosphorous) which can alter water quality conditions, such as reducing oxygen levels. Sedimentation can also smother aquatic feeding and spawning areas, as well as bury higher value substrates, reduce habitat complexity, and alter stream channels.

Tree clearing in the vicinity of streams can increase sun exposure (i.e., reduced shade) on smaller streams and result in negative impacts due to an increase in water temperature and lowered oxygen levels, which can pose problems for aquatic resources, such as cold water fisheries. Tree clearing has been minimized by co-locating new lines in existing transmission line corridors where practicable (i.e., Segments 2 and 3) and on portions of these segments requiring widening, minimizing clearing to only the width necessary to construct and safely operate the facilities.

The use of construction and maintenance equipment could result in accidental spills or leaks of petroleum products (e.g., gasoline, hydraulic fluids) onto the ground surface, which could reach surface waters if not contained and cleaned up. Although the risk of a major spill and contamination of surface waters is low, accidental spills may degrade water quality, kill or injure aquatic organisms, or limit the beneficial use of waters (e.g., drinking, recreation).

The Kennebec River would be crossed using HDD. Crossing a waterbody using HDD would avoid impacts on water quality. However, use of the HDD method could result in an inadvertent release of drilling mud into the river. Drilling mud primarily consists of water and bentonite clay. If an inadvertent release were to occur, it could temporarily impact water quality; however, the applicant would implement measures to minimize this impact, in accordance with *Requirements for Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan for HDD Operations* contained in Exhibit F of the BA (USACE 2020c).

Stream impacts would be avoided or minimized by the measures listed under the terms and conditions of the Clean Water Act Section 404 Permit and Section 401 water quality certification that have already been issued for the Proposed Project by USACE and MDEP, respectively (USACE 2020b). These terms and conditions are binding and include numerous measures to avoid and minimize impacts on surface waters from erosion and turbidity, accidental spills of leaks of petroleum products, and vegetation clearing (e.g., establishing stream buffers). In addition, one measure states that no in-water work is authorized within any perennial or intermittent stream, including temporary and permanent work.

Wetlands

Wetlands would be largely avoided as most transmission line structures would be sited outside of wetlands, and the transmission line would be strung from structure to structure across wetlands. Most of the wetland impacts are temporary impacts associated with the temporary access road wetland crossings. Long term permanent impacts on wetlands include structure placement within wetlands (structures and substation fill) and tree removal in forested wetlands. These long-term permanent impacts would result in the loss or alteration of wetland areas and affect wetland water quality, flood and storage capacity, general habitat, and natural hydrologic functions. Permanent wetland impacts along Segments 1 and 2 are minimal and associated with placement of transmission line structures. Permanent impacts along Segment 3 include transmission line structure placement. as well as placement of fill for the proposed new Merrill Road Converter station, which would comprise the permanent wetland impact. All segments would be cleared of trees from forested wetlands and would permanently convert the affected wetland to a different wetland type (i.e., emergent or scrub/shrub). The three types of wetland impacts are summarized in Table 3.5-5. The Proposed Project would permanently impact 2.45 acres of wetland, which represents 0.2

percent of all wetlands in the analysis area. Temporary impacts on 33.05 acres of wetlands; these wetlands would be restored upon construction completion. Forest conversion impacts on 54.43 acres of wetland, which represents 5 percent of all wetlands in the analysis area; these wetlands would not be lost, but wetland functions would be altered. For example, clearing forest in a wetland could reduce flood storage and capacity because the wetland vegetation would be converted to emergent and/or scrub-shrub vegetation, which may not retain or store floodwaters as well as forest.

Table 3.5-5. Wetland Impacts

Segment	Permanent Impact[1]	Temporary Impact[2]	Forest Conversion Impact[3]
Segment 1	Eight wetlands (5 PFO, 2 PSS, 1 PEM) from for a total of 157 square feet (0.0036 acre). Five of these wetlands are WOSS (80 square feet).	118 wetlands (mostly PFO), totaling 6.20 acres; 53 of these wetlands are WOSS, for total of 3.61 acres.	128 PFO wetlands converted, totaling 12.02 acres. 56 of these wetlands are WOSS, totaling 11.14 acres.
Segment 2	13 wetlands (4 PFO, 1 PSS, 6 PEM, 1 PEM/PSS/PFO, 1 PFO/PEM) for a total of 380 square feet (0.0087 acres). Five of these wetlands are WOSS (65 square feet).	79 wetlands (mostly PEM) totaling 8.44 acres; 35 of these wetlands are WOSS, for a total of 4.18 acres.	41 PFO wetlands converted, totaling 14.15 acres. 12 of these wetlands are WOSS, totaling 5.87 acres.
Segment 3	20 wetlands (4 PFO, 7 PSS, 7 PEM, 1 PEM/PFO, 1 PFO/PSS) for a grand total of 106,211 square feet (2.44 acres). Fourteen of these wetlands are WOSS (2.43 acres).	211 wetlands (mostly PEM and PFO) totaling 18.41 acres; 122 of these wetlands are WOSS, for a total of 12.89 acres.	107 PFO wetlands converted, totaling 28.26 acres. 56 of these wetlands are WOSS, totaling 19.19 acres.
TOTAL	2.45 acres[4]	33.05 acres	54.43 acres

Source: CMP December 2020
[1] Permanent impacts result in complete loss of all wetland functions.
[2] Temporary impacts are short term impacts where wetlands would be restored to preexisting conditions after construction.
[3] Forest conversion impacts would clear forest from wetlands but would not result in a loss of wetland. Wetland functions would be altered as wetland in converted to an emergent and/or scrub-shrub wetland.
[4] Most of this permanent wetland impact (2.42 acres) is from fill placement at the proposed new Merrill Road Converter station and associated access road (Segment 3).
P=palustrine, EM=emergent, SS=scrub/shrub, FO=forested, WOSS=wetlands of special significance

The USACE has already issued the Clean Water Act Section 404 Permit for the Proposed Project, and as such, all required steps for first avoiding and minimizing impacts on wetlands have occurred, as well as the development of compensatory mitigation for the unavoidable wetland impacts (USACE 2020b). A number of permit terms and conditions are listed in the Section 404 Permit and Section 401 water quality certification to protect wetlands during construction.

Floodplains

Floodplains would be largely avoided as most transmission line structures would be sited outside of floodplains, and the transmission line would be strung from structure to structure across floodplain areas. None of the substations are located in floodplains. A small number of transmission line structures along Segment 2 (one) and Segment 3 (10) would be sited in 100-year floodplain, and two transmission line structures would be placed in floodways along Segment 3; no structures or fill would be placed in 500-year floodplains. In addition, forest clearing would occur in 100-year floodplain, 500-year floodplain, and floodways. Placement of structures and vegetation clearing, particularly forest vegetation, in floodplains can impact floodplains, resulting in altered floodwater storage capacity, conveyance, and retention.

Placing fill material or structures in a floodplain can interfere with the passage, storage, and retention of floodwaters. Alteration of ground elevations in a floodplain by placement of fill material or structures causes a loss of flood storage capacity equivalent to the volume of fill or structure below the flood elevation. This reduced flood storage capacity and displacement of floodwaters can result in greater

volumes of floodwater downstream and subsequent increases in floodwater levels. Constriction of flood flow paths from loss of floodplain storage capacity may also increase floodwater elevation upstream, resulting in upstream flooding. However, placement of a total of 11 round transmission line structures in 100-year floodplain would result in negligible alteration of floodplain elevations and storage capacity because the area that 11 structure pads would occupy in the floodplains is small (only 0.015 acre in total) compared to the overall floodplain area in the analysis area crossed (142.1 acres) (CMP December 2020; Appendix C).

Proposed Project activities that would clear floodplain vegetation (but would not change floodplain elevations) could alter a floodplain's capacity to slow down, retain, and absorb floodwaters. Clearing floodplain forest vegetation during construction of the transmission line or maintaining low vegetative cover during operations and maintenance activities (e.g., in the ROW) in floodplain can lead to increased downstream flood flows, sedimentation, channel erosion, and flooding. The extent of such impacts would vary based on the amount of vegetation removed. Although much of the transmission line would be collocated in already cleared and maintained ROW, any floodplains in these areas would be minimally affected. New clearing in 100-year floodplain would total 16 acres of forest vegetation, representing 11 percent of floodplain in the analysis area (CMP 2020). New clearing of 500-year floodplain would total 0.4 acre of forest vegetation, which represents 4 percent of 500-year floodplain in the analysis area. New clearing of floodway would total 1.9 acres of forest, which represents 6 percent of floodway in the analysis area (CMP 2020). These percentages are even less when accounting for the full area of these floodplains and floodways, because they extend well beyond the analysis area.

Along Segment 3, eight floodways would be spanned by the transmission line, with two transmission line structures sited in floodways—one associated with the Sandy River, and one associated with the Carrabassett River. The impact of these structures to the floodway and flood flows is anticipated to be negligible, because the area of the structure pads in the floodway is very small (0.0009 acre total for both) compared to the overall area of the floodway in the analysis area (30.5 acres) and beyond (CMP December 2020; Appendix C). Placement of these structures in the floodways also requires compliance with the floodway requirements of the National Flood Insurance Program to ensure the structures do not result in an increase in upstream flood elevations.

Groundwater

Construction of the Proposed Project transmission line or new substation facilities would not require use of groundwater, and therefore, there would be no impact to groundwater quantity related to water use.

Construction of the Proposed Project could alter infiltration and recharge characteristics and reduce or impede infiltration of surface water runoff to groundwater due to surface soil compaction. These impacts would mostly be limited to the access road footprints that would be established through sections of the transmission line corridor. However, these access roads are unpaved (i.e., pervious) and temporary, and the access roads would be removed and restored to pre-existing conditions (i.e., contours and vegetation) once construction is complete. Surface water drainage and infiltration may be slightly altered in limited areas due to construction of the expanded Larrabee Substation and the proposed new Merrill Road Converter station. The substation yards (designed with layers of stone and gravel) would be primarily pervious and would not increase stormwater runoff above pre-existing conditions; therefore, groundwater recharge would not be significantly affected by the substation construction. The Proposed Project would have negligible effects on infiltration and recharge characteristics, and therefore, is not anticipated to have substantial impacts on groundwater recharge, including within Significant Sand and Gravel Aquifers.

Any accidental contaminant (e.g., petroleum products used for operating equipment) released to the ground during construction and operations could infiltrate and degrade groundwater quality if the contaminant were to reach groundwater. However, the effects of accidental spills on groundwater during

construction would be largely avoided by the binding measures under terms and conditions of the Section 404 Permit and Section 401 water quality certification that have already been issued for the Proposed Project (USACE 2020b). During operations, the substations have potential to affect groundwater through contaminant releases; however, the Larrabee Road Substation site, the only substation over a Significant Sand and Gravel Aquifer, already operates with a Spill Prevention, Control, and Countermeasures (SPCC) Plan that would avoid and minimize impacts on groundwater. The Larrabee Road Substation SPCC Plan would need to be updated to incorporate the expanded area of 0.08 acre for the new transformer. The Merrill Road Converter Station operations would require an SPCC Plan to address handling, spills, and cleanup of hazardous materials. MDEP, in their Order for the Proposed Project, determined that the Proposed Project would not pose an unreasonable risk that a discharge to a significant groundwater aquifer would occur or have an unreasonable adverse effect on ground water quality provided that the applicant prepares an SPCC Plan for the proposed new Merrill Road Converter Station. With terms and conditions of the already issued permits and with SPCC Plans in place, impacts on groundwater quality are not anticipated.

Operation of the Merrill Road Converter station would require the installation of one new groundwater well and a wastewater holding tank. The groundwater well would be an individual drilled bedrock well, which would be installed in accordance with Maine Department of Health and Human Services standards. The well would not impact Significant Sand and Gravel Aquifers because Merrill Road Converter station is not located over one. Groundwater volumes generated from the well are expected to be very small (100 gallons per day or less) because the Merrill Road Converter station would be staffed by small crews infrequently for routine maintenance, during power outages, and for similar operations. The wastewater holding tank would be pumped and serviced by a professional septic pumping service as necessary, and therefore, wastewater would pose no risk to groundwater quality. Overall, Merrill Road Converter station operations are not anticipated to adversely impact groundwater quality or quantity.

Water Quality

Potential water quality impacts on 303(d) impaired waters are the same as described for *Streams* above; there would be no permanent impacts on impaired waters, but temporary impacts could affect water quality. The only difference is that the Sandy River could be more sensitive to these impacts due to its impaired status. However, as stated in the *Streams* section above, these stream impacts would be avoided or significantly minimized by the measures listed under the terms and conditions of the Clean Water Act Section 404 Permit and Section 401 water quality certification that have already been issued for the Proposed Project by the USACE and MDEP, respectively (USACE 2020b).

Floodplain and Wetlands Statement of Findings

EOs 11988, Floodplain Management (May 24, 1977), and 11990, Protection of Wetlands (May 24, 1977), direct federal agencies to undertake various actions to protect floodplains and wetlands, including preparing a floodplain or wetland assessment for any action proposed in a floodplain and new construction proposed in a wetland. DOE's regulations implementing these EOs, Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR 1022), require that any floodplain or wetland assessment normally be included in an environmental assessment (EA) or environmental impact statement (EIS), if one is being prepared (10 CFR 1022.13(b)). A floodplain or wetland assessment includes a description of the Proposed Project, a discussion of its potential effects on the floodplain or wetland (including a discussion of floodplain or wetland values), and consideration of alternatives (10 CFR 1022.4).

Overview of Floodplains and Wetlands Present

Floodplains and wetlands present in the analysis area are described in the *Floodplains* and *Wetlands* sections in Section 3.5.1.1, *Surface Water*.

Impacts on Floodplains and Wetlands

Floodplain and wetland impacts are described in the *Floodplains* and *Wetlands* sections in Section 3.5.2.2, *Impact Analysis.*

Justification for Locating the Proposed Project in Floodplain and Wetland

Transmission line structures would be placed outside active channels, but it may not be possible to fully span all floodplains in the analysis area without placing a structure in a floodplain. Where floodplains may prohibit spanning, the applicant has identified areas that would have the least impact, outside of the primary flow channels. The relatively narrow-diameter base of the transmission line structure pads would not have a significant effect in diminishing the capacity of the floodplains, and thus would not exacerbate flood conditions, alter flood patterns, or increase flood risk.

Transmission line structures would largely avoid wetlands, but hundreds of wetlands and other surface waters (i.e., streams) are present along the segments making it difficult to avoid all wetlands while being able to construct and safely operate the transmission line and substations. The Section 404 Permit has already been issued by the USACE, and wetland impacts (as well as surface waters) have been avoided and minimized to the extent practicable per Section 404(b)(1) guideline requirements. For the unavoidable wetland impacts, the applicant would provide compensatory wetland mitigation to ensure no loss of wetland functions per the requirements of the issued Section 404 Permit (USACE 2020b).

With sediment, erosion, and pollutant control measures in place per Section 404 Permit and Section 401 water quality certification terms and conditions, construction disturbance would not be expected to significantly alter runoff conditions in the floodplains, and thus would not worsen flood conditions, change flood patterns, or escalate flood risk. These same measures would avoid and minimize impacts on wetlands and wetland functions.

Conformance with Floodplain and Wetland Protection

The applicant would implement all of the binding terms and conditions of the Section 404 Permit and Section 401 water quality certification, which would provide protection for floodplains and wetlands (USACE 2020b). In addition, for any development in FEMA-mapped 100-year floodplains, the applicant must comply with the National Flood Insurance Program and local FEMA-approved floodplain development ordinances and permitting requirements. The Proposed Project would conform to applicable floodplain and wetland protection standards for construction disturbance, access roads, and transmission line structures.

3.5.2.3 Applicant Committed Measures

The Section 404 Permit has already been issued by USACE and Section 401 Water Quality Certification by MDEP (USACE 2020b). The permit and certification contain numerous measures that are binding terms and conditions that protect water resources and quality. Those measures are incorporated herein by reference.

3.6 Land Use and Recreation

3.6.1 Affected Environment

3.6.1.1 General Land Use

The analysis area for land use is the ROW in Androscoggin, Franklin, and Somerset counties. This section discusses existing land use and land cover in the analysis area.

Land uses in the vicinity of the Proposed Project generally include forestry, agriculture, residential/commercial/industrial, transportation, recreation, conservation, historical, and natural features such as rivers, lakes, wetlands, and wildlife habitat areas (see Appendix D, Land Use and Recreation).

The Maine Land Cover Database (MELCD) provides information on land cover types in Maine, maps showing the land cover in the analysis area are provided in Appendix D (MELCD 2006). Using this database, the primary land cover types in the analysis area were identified as listed and described in Table 3.6-1.

Table 3.6-1. Land Use Types in the Analysis Area

	ROW		Segment 1		Segment 2		Segment 3		Substation and Converter Station*	
Land Use	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
N/A	0.21	0.00	0.21	0.01	-	-	-	-	-	-
Developed, High Intensity	6.70	0.10	2.03	0.10	1.38	0.18	3.29	0.09	-	-
Developed, Medium Intensity	15.73	0.24	1.52	0.07	-	-	14.21	0.38	0.25	0.78
Developed, Low Intensity	31.08	0.47	-	-	0.01	0.00	31.07	0.82	8.02	24.70
Developed, Open Space	12.22	0.18	-	-	-	-	12.22	0.32	2.77	8.54
Cultivated Crops	105.95	1.60	-	-	6.78	0.88	99.17	2.62	1.94	5.97
Pasture/Hay	577.90	8.74	-	-	0.02	0.00	577.88	15.27	-	-
Grassland/Herbaceous	18.61	0.28	1.13	0.05	15.56	2.02	1.92	0.05	-	-
Deciduous Forest	820.36	12.41	555.39	27.00	17.89	2.32	247.08	6.53	10.57	32.54
Evergreen Forest	754.29	11.41	235.29	11.44	36.82	4.78	482.18	12.74	1.20	3.70
Mixed Forest	1,139.36	17.23	288.81	14.04	18.43	2.39	832.12	21.98	5.94	18.27
Scrub/Shrub	1,424.09	21.54	432.06	21.00	253.13	32.87	738.90	19.52	1.01	3.11
Wetland Forest	52.85	0.80	9.25	0.45	1.54	0.20	42.06	1.11	0.08	0.26
Wetlands	59.71	0.90	3.67	0.18	0.91	0.12	55.13	1.46	0.69	2.14
Road/Runway	205.99	3.12	5.67	0.28	71.81	9.33	128.51	3.40	-	-
Unconsolidated Shore	1.28	0.02	0.03	0.00	0.17	0.02	1.08	0.03	-	-
Bare Ground	5.55	0.08	1.26	0.06	0.52	0.07	3.77	0.10	-	-
Open Water	13.23	0.20	2.43	0.12	0.72	0.09	10.08	0.27	-	-
Recent Clearcut	17.23	0.26	15.76	0.77	-	-	1.47	0.04	-	-
Light Partial Cut	724.97	10.96	143.18	6.96	254.84	33.10	326.95	8.64	-	-
Heavy Partial Cut	528.09	7.99	321.83	15.65	56.78	7.37	149.48	3.95	-	-

	ROW		Segment 1		Segment 2		Segment 3		Substation and Converter Station*	
Land Use	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Regenerating Forest	96.60	1.46	37.48	1.82	32.71	4.25	26.41	0.70	-	-
Total	6,612.00	100.00	2,057.00	100.00	770.02	100.00	3,784.98	100.00	32.49	100.00

* Includes entire footprint of existing Larrabee Road substation.
Source: CMP 2020f.

Table 3.6-2. Land Use Type Descriptions

Land Use	Description
N/A	None
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single family housing units.
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
Cultivated Crops	Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops, such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.
Pasture/Hay	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
Grassland/ Herbaceous	Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing. Characteristic land cover features: Prairies, meadows, fallow fields, clear-cuts with natural grasses, and undeveloped lands with naturally occurring grasses.
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change. Characteristic species: Maples (*Acer*), Hickory (*Carya*), Oaks (*Quercus*), and Aspen (*Populus tremuloides*).
Evergreen Forest	Areas dominated by trees generally greater than 16 feet tall and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
Mixed Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
Scrub/Shrub	Areas dominated by shrubs less than 16 feet tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
Wetland Forest	Includes all tidal and nontidal wetlands dominated by woody vegetation greater than or equal to 5 meters in height, and all such wetlands that occur in tidal areas in which salinity due to ocean-derived salts is below 0.5%. Total vegetation coverage is greater than 20%. Characteristic species: Tupelo (*Nyssa*), Cottonwoods (*Populus deltoids*), Bald Cypress *(Taxodium distichum*), American elm (*Ulmus Americana*), Ash (*Fraxinus*), and Tamarack.

Land Use	Description
Wetlands	Palustrine Scrub-Shrub, Palustrine Emergent, Estuarine Scrub-Shrub, Estuarine Emergent Palustrine Scrub-Shrub-Characteristic species: Alders (*Alnus* spp.), willows (*Salix* spp.), buttonbush (*Cephalanthus occidentalis*), red osier dogwood (*Cornus stolonifera*), honeycup (*Zenobia pulverenta*), spirea (*Spiraea douglassii*), bog birch (*Betula pumila*), and young trees such as red maple (*Acer rubrum*) and black spruce (*Picea mariana*). Palustrine Emergent Wetland-Characteristic species: Cattails (*Typha* spp.), sedges (*Carex* spp.), bulrushes (*Scirpus* spp.), rushes (*Juncus* spp.), saw grass (*Cladium jamaicaense*), and reed (*Phragmites australis*). Estuarine Scrub-Shrub Wetland-Characteristic species: Sea-myrtle (*Baccharis* halimifolia) and marsh elder (*Iva frutescens*). Estuarine Emergent Wetland-Characteristic species: Cordgrass (*Spartina* spp.), needlerush (*Juncus roemerianus*), narrow leaved cattail (*Typha angustifolia*), southern wild rice (*Zizaniopsis miliacea*), common pickleweed (*Salicornia virginica*), sea blite (*Suaeda* californica), and arrow grass (*Triglochin martimum*).
Road/Runway	Developed Hight Intensity Sub-type includes some of Maine's major highways and most airports with paved runways.
Unconsolidated Shore	Unconsolidated material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms representing this class. Characteristic land cover features: Beaches, bars, and flats.
Bare Ground	Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
Open Water	All areas of open water, generally with less than 25 percent cover of vegetation or soil. Characteristic land cover features: Lakes, rivers, reservoirs, streams, ponds, and ocean.
Recent Clearcut	This type includes areas harvested from forest with greater than 90% canopy cover removal and expected to regenerate into forest. This class is structurally similar to Crops/Ground with minimal biomass present, but the satellite imagery or other data indicated that the areas were previously forested. Characterization conditional: Forest loss must have occurred after 1995.
Light Partial Cut	This type is composed of forestland where less than 50% of the overstory canopy has been removed through harvesting. Harvesting may have occurred previously. May include improvement thinning, light shelterwood and light selection harvests. Characterization conditional: Forest loss must have occurred after 1995.
Heavy Partial Cut	This type includes forestland where greater than 50% of the overstory canopy has been removed through harvesting. Harvesting may have occurred previously. May include heavy shelter wood and heavy selection harvests. Characterization conditional: Forest loss must have occurred after 1995.
Regenerating Forest	Forested areas previously harvested that have begun to regenerate to forest are included in this type. Seedling to sapling sized trees are expected, possibly with some residual trees present. Species present will vary based on the original site composition, harvesting techniques and site disturbance, and the presence of advance regeneration at the time of harvesting. These sites will return to mature forests. Characterization conditional: Forest loss and subsequent re-growth must have occurred after 1995.

Source: MELCD 2006

As summarized in Table 3.6-1, most land cover in the analysis area (approximately 22 percent) is classified as "shrub/scrub," consisting of areas dominated by shrubs less than 16 feet tall. Following shrub/scrub is "mixed forest" at 17 percent, which consists of areas dominated by trees generally greater than 5 meters (approximately 16 feet) tall, greater than 20 percent of total vegetation cover, and neither deciduous nor evergreen species are greater than 75 percent of total tree cover. Developed land cover comprises approximately 1 percent of the analysis area.

Segment 1 is the only new proposed transmission corridor, extending 53.5 miles in undeveloped ROW from the United States/Canada border in Beattie Township to intersect with the existing Section 222 corridor in The Forks Plantation. The ROW in this section would be 300 feet wide, with the cleared corridor limited to 54 feet at its widest (originally proposed to be 150 feet). The applicant proposes to use the southernmost 150 feet of the 300-foot wide ROW for the Segment 1 corridor. (MDEP 2020).

Non-capable species of vegetation will be allowed to regrow within in the 54-foot width area after construction, establishing scrub-shrub habitat with a height of approximately 10 feet. Taller, capable vegetation outside of this 54-foot wide area will be retained, with the height of the retained vegetation increasing from approximately 15 feet to 35 feet as the distance from the scrub-shrub area increases (MDEP 2020).

In Segment 1, the transmission line corridor would be 300 feet wide, is generally forested, and is not currently developed (Maine LUPC 2020). Segment 1 is located primarily in Franklin County but also extends east into Somerset County. In Segment 1, the land cover consists of primarily forested area (deciduous, mixed, evergreen) totaling approximately 53 percent, followed by "shrub/scrub" (21 percent) and "heavy-partial cut" (16 percent), as described in Table 3.6-2. Developed land cover comprises less than 0.5 percent of this segment including "road/runway."

Segment 2 extends approximately 21.9 miles in an existing corridor from the intersect with the Section 222 corridor to the Wyman Substation in Moscow. The corridor within the existing utility ROW would be widened by an average of 75 feet to accommodate co-location of the proposed transmission line. This segment is located entirely in Somerset County. In Segment 2, the land cover consists primarily of "shrub/scrub" (33 percent) and "light partial cut" (33 percent), as described in Table 3.6-2. Developed land cover comprises approximately 10 percent of this segment, including "road/runway."

Segment 3 would extend 71.1 miles in existing corridor in an existing ROW. This segment also includes the rebuilding of 0.8 miles of 34.5 kV line outside the Larrabee Road Substation and constructing 1.2 miles of new transmission line from the proposed new Merrill Road Converter Station to the Larrabee Road Substation, as well as various structure replacements to make room for the transmission lines and installation of the driveway to the proposed new Merrill Road Converter Station. The Merrill Road Converter Station is proposed to be located adjacent to the existing transmission line on forested land in Lewiston. The utilized portion of the ROW would be widened by an average of 75 feet. This segment is in Androscoggin, Franklin and Somerset counties and land cover consists primarily of "mixed forest" (22 percent) and "shrub/scrub" (20 percent) as described in Table 3.6-2. Developed land comprises 5 percent of this segment, including "road/runway."

Land ownership in the analysis area is listed in Table 3.6-3. The applicant asserted in the proceedings for the Site Law Certification (Maine LUPC 2020: Page 10) that it has fee title, leases, or easements to all of the land within the Proposed Project corridor for lands within the LUPC's jurisdiction. LUPC jurisdiction in Segment 1 consists of lands of NPS, Maine Bureau of Parks and Land, and conservation agencies, including the Nature Conservancy, New England Forestry Foundation, and Maine Farmland Trust (CMP 2020f). Segment 1 new land ownership would consist primarily of state-owned lands (54 percent) and New England Forestry Foundation lands (45 percent). Segment 2 consists of land administered by NPS, covering the Appalachian National Scenic Trail (ANST) (100 percent). Segment 3 primarily consists of state-owned lands (37 percent) and Maine Farmland Trust lands (55 percent). As described previously, Segments 2 and 3 are in existing corridors proposed for expansion.

Table 3.6-3. Landownership in the Analysis Area

	ROW		Segment 1		Segment 2		Segment 3		Substation and Converter Station	
Land Ownership	**Acre**	**%**	**Acre**	**%**	**Acre**	**%**	**Acre**	**%**	**Acre**	**%**
Appalachian National Scenic Trail (Federal)	26.98	22.38	0.00	0.00	26.98	100	0	0	-	-

	ROW		Segment 1		Segment 2		Segment 3		Substation and Converter Station	
Land Ownership	**Acre**	**%**	**Acre**	**%**	**Acre**	**%**	**Acre**	**%**	**Acre**	**%**
Androscoggin Riverlands State Park (Maine Bureau of Parks and Land)	11.37	9.43	0.00	0.00	–	–	11.37	34.28	-	-
Cold Stream Forest (Maine Bureau of Parks and Land)	0.24	0.20	0.24	0.40	–	–	0	0.00	-	-
Johnson Mountain (Maine Bureau of Parks and Land)	18.06	14.98	18.06	29.90	–	–	0	0.00	-	-
West Forke Ne (Maine Bureau of Parks and Land)	14.13	11.72	14.13	23.39	–	–	0	0.00	-	-
Number 5 Bog Matrix Block (The Nature Conservancy)	0.86	0.71	0.86	1.42	–	–	0	0.00	-	-
Draper (New England Forestry Foundation)	27.11	22.49	27.11	44.88	–	–	0	0.00	-	-
Wyman Lake (Maine Bureau of Parks and Land)	1.03	0.85	0.00	0.00	–	–	1.03	3.11	-	-
Nutting (Maine Farmland Trust)	2.54	2.11	0.00	0.00	–	–	2.54	7.66	-	-
Sterry Hill (Maine Farmland Trust)	18.23	15.12	0.00	0.00	–	–	18.23	54.96	-	-
Total	120.55	100.00	60.40	100.00	26.98	100	33.17	100	-	-

Source: CMP 2020f.

Land Use Plans and Policies

Municipalities in Maine have “home rule” authority to implement land use ordinances for orderly development including but not limited to Site Plan Review, Shoreland Zoning, and Floodplain Management ordinances. The Proposed Project would secure all relevant approvals under the ordinances in the towns and municipalities in which the Proposed Project is located. Ordinances implemented by municipalities require consistency with local Comprehensive Plans for future development and growth.

The entirety of Segment 1 and small portions of Segments 2 and 3 are within the jurisdiction of the LUPC. The LUPC serves as the planning and zoning authority for the unorganized and de-organized areas in Maine, including townships and plantations. These areas either have no local government or have chosen not to administer land use controls at the local level. As part of its Site Location of Development Act Permit (Maine LUPC 2020), the Proposed Project received certification from the LUPC that it would be an allowed use in all LUPC land use subdistricts within the analysis area and would meet all of the applicable land use standards identified in Chapter 10 of the Commission’s Rules and Standards (see https://www.maine.gov/dacf/lupc/laws_rules/ch10.html) (Maine LUPC 2020).

As stated in the Site Location of Development Act Permit:

> CMP stated that it would utilize existing transmission line corridors to the greatest extent practicable for the Proposed Project. Approximately 73 percent of the Proposed Project would be sited in existing transmission corridors, and CMP already holds title, right, or interest to lands within these existing corridors. Regarding Segment 1, the undeveloped corridor between the Canadian border and The Forks Plantation, CMP asserts that has fee title, leases, and easements to all the land within the Preferred Alternative corridor (Maine LUPC 2020: Page 10).

Recreation

The Proposed Project crosses lands that provide recreational values to the local communities throughout the region. CMP's existing transmission line corridors are widely utilized year-round for private and commercial recreational activities including hunting, fishing, foraging, hiking (including on ANST where the existing transmission line corridor crosses the trail (Segment 2), biking, skiing, snowmobiling, birding, and boating. Recreation is typically permitted on the forest lands and lands owned and managed by the Maine Bureau of Parks and Land in the area such as Cold Stream Forest, Johnson Mountain, and West Fork Ne in Segment 1.

The Maine segment of the ANST includes 281.8 miles of the ANST (Appalachian Trail Conservancy 2020), and the trail crosses the existing transmission corridor three times in Segment 2.

Rafters along Maine's waterways, including the upper Kennebec and Penobscot Rivers usually begin their trips close to hydro facilities that include Harris Station along the Kennebec River, as well as McKay Station along the Penobscot River.

State lands in Segment 3 include the Androscoggin Riverlands State Park that extends 12 miles along the Androscoggin River and Wyman Lake.

3.6.2 Environmental Consequences

3.6.2.1 Impact Analysis Area and Indicators

The impact analysis area for land use and recreation is the ROW and Androscoggin, Franklin and Somerset counties. As described above, the Proposed Project received certification from the LUPC that it would be an allowed use in all LUPC land use subdistricts within the analysis area and would meet all of the applicable land use standards (Maine LUPC 2020). Therefore, there are no indicators for considering impacts on land use. However, a quantitative discussion of disturbance to land use and ownership is presented.

The following indicator was considered when analyzing potential impacts on recreation:

- Loss or diminishment of developed (e.g., off-highway vehicle, hiking, rafting, hunting, fishing) and undeveloped recreational values and quality in the impact analysis area

3.6.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, a Presidential permit would not be issued to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in Maine, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Action

General Land Use

Table 3.6-1 summarizes the land uses in the analysis area that would be disturbed for construction of the proposed new corridor in Segment 1 and the proposed expansion of existing corridors in Segments 2 and

3. The Proposed Project would permanently affect a total of 6,612 acres, of which Segment 1 would include 2,057 acres in undeveloped ROW with 300-foot-wide ROW, but the cleared corridor would be limited to 54 feet at its widest point (originally proposed to be 150 feet) Non-capable species of vegetation will be allowed to regrow in this area after construction, establishing scrub-shrub habitat with a height of approximately 10 feet. Taller, capable vegetation outside of this 54-foot wide area will be retained, with the height of the retained vegetation increasing from approximately 15 feet to 35 feet as the distance from the scrub-shrub area increases (MDEP 2020: Page 96). Expanding the ROW by an average of 75 feet to accommodate co-location of the proposed transmission line in Segment 2 would permanently affect 770 acres. Expanding the utilized portion of the corridor in Segment 3 would permanently affect 3,785 acres, as well as 17 acres for construction of the proposed new Merrill Road Converter Station and network upgrades. Table 3.6-1 lists the 22 land use/cover types and the amount of long-term disturbance. The land cover types that would be most affected are shrub/scrub (2,849 acres) and deciduous forest (2,281 acres) totaling 5,131 acres.

Table 3.6-3 summarizes the new landownership under the jurisdiction of the LUPC, consisting of NPS, Maine Bureau of Parks and Land, or conservation agencies in the impact analysis area that would be affected by construction of the new corridor in Segment 1 and expansion of existing corridors in Segments 2 and 3. The Proposed Project would permanently affect a total of 121 acres, of which Segment 1 would include 60 acres in undeveloped ROW with 300-foot wide ROW, except in the 1-mile portion that traverses Merrill Strip Township for which the ROW would be 150 feet in width. The width of the cleared portion of the corridor would be limited to 54 feet at its widest point. Taller tapered vegetation would be maintained to 48 feet beyond the 54-foot width (MDEP 2020). Expanding the ROW in Segment 2 by an average of 75 feet to accommodate co-location of the proposed transmission line would permanently affect 27 acres. Expanding the utilized portion of the corridor in Segment 3 would permanently affect 33 acres.

Unauthorized ROW Use

There are no public roads in Segment 1 until the corridor would cross U.S. Route 201 and access to the area is by private roads only. The primary unauthorized use that could be an issue would be off-road vehicle use, such as all-terrain vehicles (ATV). The applicant would gain access to the proposed corridor in Segment 1 by using public roads, as well as existing land management roads that have been primarily established by the forestry industry. Access in the transmission line corridor in this segment would be temporary in nature and all temporary access roads would be restored and allowed to revegetate to a scrub-shrub cover type. The lack of permanent access within the corridor would discourage unauthorized ROW use. In Segment 1, other than the permanent access roads to the termination stations on the upper Kennebec River, no new permanent roads would be created.

Recreation

There would be minimal loss or diminishment of existing recreational values and quality. Construction of the Proposed Project would not be expected to permanently (i.e., long-term) preclude the use of or access to any existing recreation opportunities or activities, but some short-term impacts would occur intermittently during the construction phases. Recreation in the impact analysis area and adjacent areas, such as hunting, fishing, foraging, hiking, biking, skiing, snowmobiling, birding, and boating/rafting, would be affected in the short-term, as construction noises, visual disturbances, and/or the presence of other people could detract from these recreation opportunities and activities. The impacts would cease at the end of construction and return to the current condition.

The Proposed Project has been sited and designed such that it would minimize interference with the recreational uses in the surrounding area. Active forest management and transmission line facilities in the impact analysis area are part of the existing recreational environment and would not likely affect

recreational uses. Those rafting, fishing, or boating the Kennebec and Penobscot Rivers, would have views of the transmission lines that run in close proximity to and cross the river corridors. The upper Kennebec River crossing would be located underground and so would not be visible to users of the river. See also Section 3.7.2.2, *Impacts Analysis*, which discusses visual impacts on recreational uses.

Temporary disruptions to traffic associated with the ingress and egress of construction equipment and materials into the Proposed Project corridors for clearing and construction activities. The applicant would use appropriate traffic safety procedures (e.g., signage, flaggers, etc.). However, traffic diversions or detours are not anticipated. The applicant would coordinate activities with landowners, customers, public services, and recreational clubs to minimize potential disruptions to the maximum extent practicable. Temporary snowmobile trail closures or relocations may be required in areas of active construction.

As described, the ANST in Segment 2 crosses the existing transmission corridor three times near Moxie Pond in the Bald Mountain Township. As described in Section 3.10.2, *Environmental Consequences*, during Section 106 consultation (USACE et al. 2020; USACE et al. 2021), it was concluded that the ANST user's experience would be enhanced by realigning the trail to the pre-1987 route and reducing the number of trail crossings. The modified trail alignment would cross the ROW once along Segment 2 in the vicinity of where the trail route was circa 1956 and 1962. In addition, the existing two-vehicle parking area west of Troutdale Road would be expanded to 10 vehicles. Construction in the vicinity of the ANST would be performed in a manner that: (1) allows for hikers to safely use the trail, (2) allows construction crews to safely construct the Proposed Project, (3) protects the natural resources to the greatest extent practicable, (4) minimizes erosion and sedimentation, and (5) restores areas temporarily disturbed by construction to original contours and permanently stabilizes the ROW (CMP 2020g).

3.6.2.3 Applicant Committed Measures

The applicant would implement practical measures to discourage impacts to sensitive resources from public ATV use and unauthorized use after construction including:

- Communication with local organized clubs through the State of Maine Department of Agriculture, Conservation and Forestry's Bureau of Parks and Lands, Off-Road Recreational Vehicle Office
- Use of signage and deterrents (e.g., boulders, gates, etc.) in areas of high ATV activity
- Reporting of unauthorized ATV travel to law enforcement (e.g., Maine Warden Service) as needed to halt excessive disturbance of recently restored and stabilized areas or in instances where environmental impact associated with public use persists following the implementation of deterrents

The USACE permit requires by special permit condition #25(b) on page 14: "To the maximum extent practicable, the permittee will gate access roads under CMP's direct control to vehicle traffic (not foot traffic) with approval from the landowner during the fall trapping and hunting seasons to further reduce the likelihood of incidental take of lynx" (CMP 2020g; USACE 2020c).

The following applicant-proposed measures are incorporated into the construction, operation, and maintenance of the Proposed Project in an effort to minimize impacts on ANST hikers.

- All construction activities within the section of transmission line corridor associated with the three ANST crossings would occur between October and May, and primarily during the winter months when there typically are fewer hikers.

- The ANST would be relocated on an interim basis during construction to further limit exposure to hikers, outside of the clearing limits but within the existing NPS easement area.

- Signage alerting hikers to the construction activity would be posted and maintained during active periods of construction.

- Contractors working in the area would be required to provide spotters who would escort hikers through active work areas as necessary.

- Orange safety fencing would be installed on both sides of the trail, prior to construction activities, to prevent hikers from going off the trail and entering construction work areas while hiking in the corridor.

3.7 Visual Resources

3.7.1 Affected Environment

The analysis area for visual resources is 3 miles on all sides of the new or upgraded transmission lines and substations and up to 5 miles beyond the Proposed Project for elevated viewpoints within the viewshed. A viewshed analysis was also completed for the entire 5 mile analysis area. This analysis area was reviewed by MDEP staff on July 19, 2017 prior to developing the Visual Impact Analysis (VIA) (Terrence J. DeWan & Associates 2017). The MDEP and USACE have approved the VIA, including the analysis area. Throughout this assessment, all references to rebuilding transmission lines are limited to the NRPA application (NECEC 2017).

3.7.1.1 Landscape

Segment 1

The analysis area of Segment 1 is mostly located within the Western Mountains Biophysical Region. This region is characterized as a mountainous landscape with elevations ranging between 2,100 and 3,700 feet. The analysis area includes 27 elevated viewpoints (hills and mountains) within 5 miles of Segment 1 as shown in Table 6-2 of the *Site Law Application, Chapter 6: Visual Quality and Scenic Character* (NECEC 2017). The watershed of this mountainous area drains through small streams toward the East and West Branches of the Moose River, into the South Branch of the Moose River, the Moose River, and the Kennebec River. The northern portion of the Segment 1 analysis area including Moose River and No. 5 Bog drains northward toward Attean Pond toward Moosehead Lake to the Kennebec River. The area within 3 miles of Segment 1 includes numerous small to medium sized waterbodies, typically surrounded by spruce fir vegetation in heights ranging from 40 to 60 feet.

Segment 2

The analysis area of Segment 2 is located within the Central Mountains Biophysical Region 10. The Segment 2 analysis area is characterized by medium to large waterbodies surrounded by mountains with elevations ranging between 1,630 and 2,630 feet. The closest elevated viewpoints on the Appalachian Trail are Bald Mountain and Pleasant Pond Mountain. The analysis area includes seven elevated viewpoints (mountains) within 5 miles of Segment 2 (NECEC 2017).

The two largest waterbodies are Moxie Pond (2,370 acres) on the north end of Segment 2 and Wyman Lake (3,200-acre impoundment) at the southern end. The area within 3 miles of Segment 2 includes

several small to medium waterbodies typically surrounded by spruce/fir vegetation averaging 60 to 75 feet in height and commercially harvested areas.

Segment 3

Segment 3 is divided into two different landscape characters. The northern portion of the analysis area is located within the Central Mountains and Western Foothills Biophysical Regions14 and is characterized by the Kennebec River and Sandy River watersheds with numerous small to medium waterbodies ranging in size from 6 to 196 acres. There are also a few larger waterbodies: Embden Pond (1,568 acres) in Embden and Clearwater Pond (751 acres) in Industry. The northern portion of the Proposed Project analysis area is surrounded by medium hills and mountains with elevations ranging between 1,200 and 1,850 feet. This portion of the analysis area includes Bingham, Concord Plantation, Embden, Solon, Anson, Madison, Starks, Industry, Farmington, New Sharon, Wilton, and Chesterville. The Kennebec River flows for 27 miles through the north portion of Segment 3 with several of the population centers located along its banks including the villages of Bingham, Solon, North Anson, Anson, and Madison. The Proposed Project would be located within the existing 115-kV transmission line corridor which is 0.25 to 1.5 miles to the west of the Kennebec River. The Sandy River flows through Farmington and the central portion of the analysis area toward the Kennebec River.

The southern portion of the Segment 3 analysis area is within the Western Foothills Biophysical Region. It is characterized by the Androscoggin River watershed, small to medium waterbodies generally ranging in size from 3 to 208 acres, and medium hills with elevations ranging between 665 and 1,116 feet. The largest waterbodies are Androscoggin Lake (3,980 acres) and Lake Auburn (2,260 acres) within the analysis area. The southern portion of Segment 3 includes the Towns of Jay, Livermore Falls, Leeds, Greene, and Lewiston. The largest population center is Lewiston.

The Androscoggin River flows for 41 miles through the southern portion of the analysis area and is crossed by the Proposed Project in Auburn. The Proposed Project would be located within the existing 115-kV transmission line corridor, 0.7 to 1.8 miles east of the Androscoggin River (NECEC 2017).

3.7.1.2 Human Settlement

Segment 1

Segment 1 is primarily located within a commercial forest with several significant areas of conservation land within the analysis area. The vegetation on the land immediately surrounding the Proposed Project is mixed deciduous and coniferous second growth with areas of active harvesting. Vegetation ranges in height from 0 feet (existing laydown areas) to 60 feet. Land use in the immediate vicinity of the transmission line is predominantly commercial forest with sparse seasonal camps on adjacent ponds. The largest population centers within Segment 1 are the villages of West Forks and The Forks Plantation, both located approximately 5 miles from the Proposed Project. Jackman is over 8 miles to the north of the Proposed Project.

Segment 2

Land uses in the immediate vicinity of the co-located transmission line includes commercial forest lands, numerous seasonal camps on adjacent ponds, and the former Moscow radar sites. The most significant conservation land parcel is the National Park Service Appalachian Scenic Trail Unit located in Bald Mountain TWP and Caratunk. The largest population center is the village of Moscow at the southern end of Segment 2.

Segment 3

The majority of land immediately surrounding Segment 3 is mixed forestland with occasional agricultural fields. The existing transmission line is predominantly edged with 50 to 70-foot-tall mixed deciduous and evergreen trees. Land uses in the immediate vicinity of the transmission line are predominantly woodland, farmland, and low density rural residential with clusters of village development.

3.7.2 Environmental Consequences

3.7.2.1 Impact Analysis Area and Indicators

Photosimulations (computer-altered photographs) have been prepared to illustrate the anticipated changes to the new and co-located transmission line corridors and the surrounding landscape. The simulations concentrate on scenic resources that may be affected by the Proposed Project. A total of 41 key observation points (KOPs) from scenic resources and locally sensitive resources were selected for the development of photosimulations to illustrate the 'worst case' visibility and potential visual impact of the Proposed Project. The Photosimulations are found in Appendix E.

A viewshed analysis was prepared to identify locations within the analysis area where potential visibility of any portion of one or more proposed transmission structures could occur. The viewshed analysis was used to guide fieldwork to areas of potential visibility of the Proposed Project from scenic resources and other visually sensitive areas within the viewshed. Two types of viewshed analysis were created. A topographic viewshed analysis was prepared using Digital Elevation Model (DEM) from the USGS National Elevation Data (NED) website. This data was used to develop a Digital Terrain Model (DTM) ground surface model for the entire five mile analysis area. Transmission structures were provided by POWER Engineers with an elevation and structure height and configuration. The visibility command found in Spatial Analysis Extension for ArcMAP was then used to determine areas where the structures could be visible from within the analysis area. The topographic viewshed analysis does not account for the screening effects of vegetation but it does provide a baseline understanding of where there is no possible visibility of the Proposed Project due to the screening effects of topography.

To gain a more realistic understanding of potential visibility of the Proposed Project, an additional viewshed analysis was prepared to show the effect of tree cover on visibility. The DTM surface was converted to a Digital Surface Model (DSM) using Maine Land Cover Data Classifications from the Maine Office of GIS. A landcover height raster was developed using specific heights for land covers in the analysis area. This raster file was overlaid on the base map to indicate where it is not likely to have Proposed Project visibility due to the screening effects of 40-foot tall vegetation. These viewshed analyses illustrations are provided in Appendix E.

The applicant also provided a scenic resources chart that describes potential project visibility from visually sensitive or protected areas, such as National Wildlife Refuges, State and Federally designated trails, properties listed on the National Register of Historic Places, publicly accessible conservation areas, and roads determined to have scenic qualities or cultural character (CMP 2020t).

It is important to note that the following impact analysis is a summary of the VIA, as provided in the NRPA application (NECEC 2017) and includes updates found in the permit modification package submitted to MDEP and USACE in December 2020 (CMP 2020t).

Landscape Character

Landscape compatibility is a function of the sub-elements of color, form, line, and texture. Compatibility is determined by whether the proposed activity differs significantly from its existing surroundings and the context from which they are viewed such that it becomes an unreasonable adverse impact on the visual quality of a protected natural resource as viewed from a scenic resource.

Color: This section describes anticipated color contrasts between existing conditions and proposed materials to be used for the Proposed Project. In the case of transmission structures, new wooden poles may initially be darker than the existing poles but the contrast would diminish with time as normal aging occurs. Color contrast for new transmission structures in existing transmission line corridors is generally rated as minimal. Moderate contrasts in color may occur in situations that use self-weathering steel transmission structures, which are typically darker in color than wooden poles that have weathered to a light gray color. Where no other structures exist, the self-weathering steel can be more similar in color to surrounding wooded landscape.

Most of the electrical equipment used in substations would be galvanized or painted a silver color, which would match the existing equipment and that of adjacent substations.

Form: The form (three-dimensional shape) of the transmission structures that are being proposed for the HVDC structures are similar to single pole structures currently found in transmission line corridors upgraded during the Maine Power Reliability Program (MPRP) project. The proposed single pole 115-kV structures and H-frame 345-kV structures are commonly seen in areas where they are proposed for the Proposed Project. In most instances, the new transmission structures are expected to result in a minimal contrast in form with the surrounding trees and existing transmission structures. Moderate contrasts in form may result in situations when there is disparity between the existing and proposed transmission structures (e.g., a new HVDC single pole self-weathering steel structure located adjacent to an existing wood H-frame structure).

Line: The analysis describes the projected changes to the transmission line corridor, the conductors, and the transmission structures, all of which are linear elements in the landscape. It also determines if any of the transmission structures (vertical lines) or conductors (horizontal lines) would be seen against the sky from prominent viewpoints or scenic resources. The degree of contrast in line is a function of the distance from the observer, the relative length of the structure that is visible above the horizon, or the magnitude of other new lines introduced into the landscape.

Substations are typically composed of very linear elements—vertical, horizontal, and angular components—in addition to the lines of the conductors entering the facility. In the existing substations where new equipment would be added, there would be minimal to moderate contrast in line, depending on whether the new components would be visible above the horizon. New substations could have a moderate to strong contrast between the lines found in nature and the lines introduced by the substation.

Texture: The HVDC structures would be single pole self-weathering steel, which has a smoother (and darker) texture than the standard wooden poles. There may be moderate contrasts in texture in situations where the HVDC structures are viewed adjacent to wooden structures. The standard wooden structures have a texture similar to the existing H-frame poles and monopoles used throughout the corridors. There is generally no contrast in texture for new transmission structures made of the same material. The texture of the improved substations would be similar to the existing facilities, so there would be virtually no contrast in texture. In the case of new substations, the electrical equipment could have a moderate to strong contrast in texture with the surrounding vegetation and abutting land uses.

Human Settlement

Several groups of people may be affected by the Proposed Project. Most already see or come into contact with transmission lines and substations at different times during the year. The level of sensitivity to the visual changes that may result from the Proposed Project is site specific and would depend on the type and use of the resource, duration of exposure, distance from the Proposed Project, and potential mitigation.

Residents

The primary viewing population for most of the Proposed Project is the year-round residents who live along the roads that intersect or run along the existing transmission line corridors or those who live within the viewshed of the substations. The majority of the homeowners that may see the transmission line corridors live in rural areas outside of established residential areas. For substations, particular attention is paid to abutting residential properties. The VIAs describe the number, proximity, orientation, and existing buffers for those homes that may be affected by the upgrades. There are very few residents within the viewshed of Segment 1.

Motorists

This category of users includes local residents, commuting traffic, delivery personnel, and others who use local roads that cross the transmission line corridors as part of their daily routines.

Recreating Population

Several types of recreation occur within the Proposed Project analysis area including snowmobiling, ATV riding, camping, boating, fishing, swimming, bird watching, cross-country skiing, snowshoeing, hiking, mountain biking and dog-walking. Several of these types of recreation are enjoyed by people who use existing transmission line corridors or the resources within their viewshed and/or lands surrounding the substations.

Working Population

The working population includes people who are employed throughout northern Maine in commercial timber harvesting, and in central and southern Maine in agriculture, construction, land management activities, trucking, and other occupations that put them in transmission line corridors and/or substation viewsheds more frequently.

3.7.2.2 Impact Analysis

The analysis in this section identifies impacts that may result in some level of change to visual resources. The impact analysis and conclusions are based on the reviews of existing literature and baseline data, provided in the VIA and the NRPA application (NECEC 2017, CMP 2020t, Terrence J. DeWan & Associates 2017). Below are the definitions for impact intensity used in this section.

- Negligible: Impacts would result in a change in current conditions that would be too small to be physically measured using normal methods or would not be perceptible. There is no noticeable effect on the natural or baseline setting. There are no required changes in management or utilization of the resource.

- Minor: Impacts would result in a change in current conditions that would be just measurable with normal methods or barely perceptible. The change may affect individuals of a population or a small

portion of a resource, but it would not result in a modification in the overall population, or the value or productivity of the resource. There are no required changes in management or utilization of the resource.

- Moderate: Impacts would result in an easily measurable change in current conditions that is readily noticeable. The change affects a large percentage of a population, or portion of a resource which may lead to modification or loss in viability, value, or productivity in the overall population or resource. There are some required changes in management or utilization of the resource.

- Major: Impacts are considered significant. Impacts would result in a large, measurable change in current conditions that is easily recognized. The change affects a majority of a resource or individuals of a population, which leads to significant modification in the overall population, or the value or productivity of the resource. This impact may not be in compliance with applicable regulatory standards or impact thresholds, requiring large changes in management or utilization of the resource.

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Segment 1

Landscape

Color: The proposed single-pole HVDC transmission structures would be constructed of weathering steel (self-oxidizing) that would have a dark brown, rusty appearance. For most of the viewpoints from scenic resources, the difference in color would result in a relatively minor visual impact in the context of the surrounding commercial forest. Where the structures are seen silhouetted against water (from elevated viewpoints) or against sky (from low elevation viewpoints), the dark color would create a stronger color contrast. In some locations where just the tips of the structures are visible at longer distances, the rusty brown color would make the structures appear tree-like in form and color and therefore less distinguishable from the surrounding forest.

Form: Segment 1 would use one type of transmission structure: a single pole structure averaging 100± feet tall. Similar single pole structures are currently used in transmission lines in central Maine. The structure form is generally similar in vertical form to adjacent trees resulting in minimal contrast in form. The new cleared corridors are generally similar to areas commonly seen throughout the working forest also resulting in minimal contrast in form.

Line: Segment 1 would contain one HVDC transmission line throughout its length. The conductors and cleared corridor would create new lines visible within the viewshed. The line created by a cleared corridor would be less distinct when located within existing harvested areas, such as when viewed from Coburn Mountain and Wing Pond. From elevated viewpoints where the Proposed Project is seen in the background such as from Attean View and No. 5 Mountain, the line is somewhat indistinct and minimal in contrast. Where harvesting is not readily visible and the cleared corridor is partially visible, the Proposed Project would create a moderate contrast in line, such as at Moxie Stream. Where the cleared corridor is visible within the foreground and creates a silhouetted ‘notch’ against the sky along a ridge line, such as from Rock Pond, there would be a strong contrast in line. Similarly, in areas that generally

appear undeveloped and natural such as the Kennebec River, the structures, cleared corridor and conductors would result in a strong contrast in line.

Texture: The HVDC structures would be single pole self-weathering steel, which have a smoother texture than the standard wooden poles. This texture would cause a minimal contrast in texture.

Human Settlement

Motorists

The primary viewing population is the year-round residents who live or work near Route 201 and those who are driving on the Old Canada Road National Scenic Byway for pleasure. Motorists presently see distribution lines along Route 201 and clustered pockets of development in areas near Parlin Pond, West Forks Plantation, and The Forks Plantation. The road corridor generally appears wooded on both sides with preserved 'Beauty Strips" remaining to screen commercial timber harvesting areas on either side. At the location of the Route 201 crossing, the existing wooded vegetation on either side of the road is approximately 30 to 50 feet in height and would screen the cleared corridor for approaching motorists. The tops of one structure on the east side of the road would be partially visible for approximately one mile heading north and for 1,800 feet heading south. In general, the crossing would be minimally noticeable due to the structures being setback from the road, the horizontal curve in the road approaching the crossing heading south, and the limited duration of exposure (30 seconds to 1 minute) due to travel speed.

A smaller number of motorists would see the Proposed Project while traveling to camps off Spencer Road, Capital Road, and Lake Moxie Road. When traveling on Spencer Road or Capital Road, the motorist would see the Proposed Project in context with the working forest. When traveling on Lake Moxie Road the motorist would see the Proposed Project in context of the existing transmission corridor that crosses the road 700 feet to the east of the proposed crossing. Motorists would continue to use the roads for work, pleasure driving, and to access their camps. The Proposed Project would have no to minimal effect on their continued use and enjoyment of those roads. There would be minimal visual impact to motorists.

Residents

There are a minimal number of residents within the Segment 1 viewshed because it is mostly within commercial forest lands. The primary residents who would view the Proposed Project include one camp owner on Beattie Pond, one camp owner and transient campers on Rock Pond, approximately 50 camp owners on Parlin Pond, one camp on the south side of Moxie Stream (off Mina's Way), and four camps on the north side of Moxie Stream off Fish Pond Road. As noted above the Proposed Project would also cross Lake Moxie Road approximately 700 feet west of the existing transmission line crossing. There is one home on the southwest side of the corridor on Lake Moxie Road that would have views of the new cleared corridor and conductors but the proposed HVDC transmission line structures would not be visible. The closest structure would be approximately 500 feet to the southeast but would be screened by intervening vegetation.

The single visible structure from Beattie Pond would most likely not be visible from the camp due to intervening vegetation. The majority of camps on Parlin Pond are located on the west side of the Pond and oriented toward the east and away from the Proposed Project. The approximately 5 camps on the northeast end of Parlin Pond would have views of the Proposed Project as it crosses the shoulder of Coburn Mountain 2.9 miles to the southwest. The camp owners on either side of Moxie Stream would drive under the transmission line en route to their camps but all but one (on the north side) would not actually see the Proposed Project from their camps due to intervening vegetation. The residents on Lake Moxie Road would have limited views of the Proposed Project from their homes. Few residents would

have views of the Proposed Project. For those minimal number of camps with views, there would be minimal to moderate visual impacts depending on viewing distance.

Recreating Population

There are several types of recreational users that would be affected by the Proposed Project including hikers on No. 5 Mountain and Coburn Mountain; ATV users and snowmobilers using ITS trails 87 and 89 and Coburn Mountain; those who travel on local roads while hunting; boaters and those who fish on Beattie Pond, Wing Pond, Rock Pond, Moxie Stream and Parlin Pond; and rafters on the Kennebec River.

The view from No 5 Mountain is in the background and would be minimally visible. The Proposed Project would not negatively affect the hiker's experience or the public's continued use and enjoyment of No 5 Mountain. Although Proposed Project views from Coburn Mountain are both in the midground and background, and more of the cleared corridor would be visible, the users expects to see active timber harvesting, and logging roads which are similar in line, color and form to the Proposed Project. Moreover, the primary users of Coburn Mountain are ATV and snowmobile riders who commonly use transmission corridors as part of their network of trails. The Proposed Project would not negatively affect the public's continued use and enjoyment of Coburn Mountain. Hunters commonly use logging roads and local gravel roads for access while hunting. Those hunting in this area expect to see logging roads and harvested areas which are generally similar to the Proposed Project. The Proposed Project may even create more opportunities for hunting access. The Proposed Project would not negatively affect hunter's continued use and enjoyment of the analysis area.

Although those who fish on Beattie Pond, Wing Pond, Rock Pond, Moxie Stream and Parlin Pond are primarily focused on the river, the Proposed Project would be visible to anglers and boaters in these areas and would diminish their enjoyment. Users of these water resources generally have high expectations for visual quality. DOE concluded that the Proposed Project would result in negligible to moderate impacts on visual resources for anglers and boaters in these areas.

Rafters using the Kennebec Gorge access the river location via a set of stairs adjacent to the Harris Dam. The rafting resource is dependent on scheduled water releases from the Harris Dam. Rafters are aware of the existing transmission lines adjacent to the parking and preparation areas prior to rafting. Rafters enter the river and run a range of Class III–V rapids within the first 5 miles of the rafting experience. The Proposed Project crosses the Kennebec about 3 miles downstream of the last major Class III and IV rapids (Black Brook Rapids). The 3 miles between Back Brook Rapids and the Proposed Project crossing location are free flowing with occasional Class I or II rapids. At the Proposed Project crossing location, the river is generally flatwater and the rafters are allowed to swim. Most rafting companies offer lunch for the rafters at different locations in the vicinity of the Proposed Project crossing. From the picnic area north of the crossing, the conductors would be visible, but the structures would be screened from view by vegetation and topography. From the southern picnic area looking north, one HVDC transmission line structure and conductors would be visible. Lunch typically takes 1 hour. After lunch, rafters continue down the river for approximately 3.5 miles to the location where the rafts are taken out of the river near The Forks Rest Area. Most trips begin around 10:30 am and take out is generally around 3pm. Rafters of the Kennebec River have a high expectation for visual quality. Although the most active portion of the trip would not have Proposed Project views, portions of the Proposed Project would be visible from other portions of the river; therefore, visual intrusions would still be noticeable to rafters, diminishing rafters' enjoyment. Rafting companies have options for choosing picnic locations without Proposed Project views. If they choose one of the locations closest to the Proposed Project crossing, the rafters may be potentially exposed to the Proposed Project for up to an hour. The presence of the Proposed Project would not deter rafters from swimming but may slightly diminish their enjoyment of scenery from certain picnic areas. Visibility of the crossing itself would be for a relatively short duration as rafters float past the 150-foot-wide corridor. Woody vegetation, including mature capable trees would be preserved within 150 feet

on the east side and 250 feet on the west side of the edge of the river to minimize views into the corridor from the river. The calculation to allow capable species to remain within the corridor is based on conductor height and sag, required clearance from conductor to vegetation, topography between the river and each pole, and assumed maximum mature tree height of approximately 75 feet (trees taller than 75 feet in height and within the transmission line corridor may need to be removed in order to prevent their encroachment into the conductor safety zone). The tips of one structure would be visible looking in each direction, but the majority of the structures would be screened by the preserved trees.

Brookfield Renewable Power, owner of the Harris Station Dam Hydro Electric Facility, maintains records of all rafting companies and has indicated approximately 20 rafting companies register to use the river throughout the season. There are approximately 10 rafting outfitters consistently running trips on the Upper Kennebec each year. The rafting community has provided use numbers indicating that the average number of rafters (with a rafting company) over the past 3 years was about 42,000 per year. Each rafting company is allowed to have 120 rafters per day during the rafting season from April 15 to October 15. The industry typically licenses approximately 100 whitewater guides a year, many either rent a raft or own their own raft and take friends and family down multiple times a year. These individual users account for approximately 10,000 additional users per season.

Overall, the Proposed Project would have minimal to moderate visual impact on recreational users depending on location, activity, and duration of exposure.

Working Population

The primary working population affected by the Proposed Project include the people who are employed throughout Segment 1 in commercial timber harvesting. Segment 1 is primarily located within working forests accessed off Spencer Road in Parlin Pond Twp, Bradstreet Twp, T5 R7 BKP WKR, Hobbstown Twp, Appleton Twp, Skinner Twp, Goldbrook Road in Skinner Twp, and Capitol Road in Johnson Mountain Twp. There would be minimal visual impacts on the commercial timber working population in the area.

Another working population affected by the Proposed Project includes the seasonal rafting companies and boating guides using the Kennebec River, and recreational and sporting guides who use area waterbodies for boating, fishing and hunting. As noted in the review of the scenic resources above, there would be minimal to moderate impacts on commercial users of the Kennebec River depending on duration of exposure (where picnic sites are chosen). Guides using other recreational resources would experience minimal to moderate visual impacts depending on location, activity and duration of exposure (i.e. if they chose to use a resource with Proposed Project views).

Conclusion

Based on the range of potential visual impacts and the VIA provided in the NRPA application (NECEC 2017, CMP 2020t, Terrence J. DeWan & Associates 2017), Segment 1 would not significantly interfere with existing scenic and aesthetic uses. However, DOE concluded that Segment 1 of the Proposed Project would result in negligible to moderate adverse impacts to visual resources in the surrounding area.

Segment 2

Landscape

Color: The proposed single-pole HVDC transmission structures would be constructed of weathering steel (i.e., self-oxidizing) that would have a dark brown, rusty appearance. From most of the Segment 2 viewpoints, the difference in color between structures and surrounding vegetation would result in a

relatively minor visual impact. Where the HVDC structures are seen adjacent to the existing wooden H-frame structures, there would be a stronger color contrast.

Form: Most of Segment 2 would use one type of transmission structure: a single pole structure averaging 100 feet tall which would result in a minimal to moderate contrast in form. The angle structures would be 2-pole structures more similar in form to the existing H-frame structures.

Line: Segment 2 is co-located with an existing transmission line therefore the proposed conductors and cleared corridor would create minimal additional line contrast. Where the proposed conductors but not the existing conductors are visible, there would be a moderate line contrast. However, increased viewing distances would diminish the line contrast visibility from elevated viewpoints.

Texture: The HVDC structures would be single pole self-weathering steel, which have a smoother texture than the standard wooden poles. This texture would cause a minimal contrast in texture.

Human Settlement

Motorists

The main motorists who would see the Proposed Project include the camp owners who drive on Lake Moxie Road and Troutdale Road to access camps on Moxie Pond, and homeowners in Moscow who live off Heald Pond Road, Chase Pond Road, Stream Pond Road, Wolf Mountain Pass Road, Bassett Lane, Henry Beaudoin Road, Burns Road, and Donigan Road. Motorists presently see the existing 115-kV transmission line in several locations where they cross existing roads or where there is no vegetation between the road and the existing corridor. The longest duration of exposure would be on Troutdale Road for approximately 1,000 feet where the road is located within the eastern side of the existing cleared corridor (see Photosimulation 18, Appendix E). The proposed widened corridor and HVDC structures would be located on the west side of the corridor away from the road. Motorists would continue to use the roads to access their camps and homes. Due to the Proposed Project being co-located with the existing transmission line corridor, DOE concluded that there would be minor to moderate effect on motorists' continued use and enjoyment of those roads. There would be minor to moderate visual impact to motorists.

Residents

Most camp residents on the west side of Moxie Pond and Baker Stream have preserved vegetation between their camps and the existing 115-kV transmission line corridor. Because the Proposed Project would be located on the west side of the corridor, there would be no change in the vegetative buffer and therefore no visual impacts. The camp owners on the east side of Moxie Pond (mostly clustered around Mosquito Narrows) may have limited views of the tops of 3 to 5 HVDC transmission structures at a distance of 0.2 to 1 mile. The majority of the structures and conductors would be either screened by shoreline vegetation or seen against the wooded backdrop. The visual impact to camp owners on the east side of Moxie Pond would be minimal. The Proposed Project would not negatively affect the camp owners' experience or their continued use and enjoyment of their camps.

On Troutdale Road near Joe's Hole/Baker Stream and the crossing of the Appalachian Trail, there are camps on either side of the existing transmission line: one 400 feet to the northeast, and one 180 feet to the southwest. With the 75 feet of proposed clearing on the west side of the corridor, the existing vegetated buffer for the camp on the west side of the transmission line would be reduced and may result in a narrow opening to the corridor. The proposed HVDC structures would not be visible from the camp but the widened corridor may allow one existing 115-kV transmission structure to be visible. The visual impact to camp owners on Troutdale Road would be none to minimal depending on the screening effect of remaining vegetation.

Most residents in Moscow whose driveways currently cross the existing 115-kV transmission line corridor have significant vegetative buffers between their homes and the existing cleared corridor and would not be affected by the Proposed Project. Homeowners off of Donigan Road may see portions of the HVDC structures above the tree line depending on the vegetative buffer on their property. The visual impact to homeowners in Moscow on Heald Pond Road, Chase Pond Road, Stream Pond Road, Wolf Mountain Pass Road, Bassett Lane, Henry Beaudoin Road, Burns Road, and Donigan Road would be none to moderate depending on existing vegetative buffers remaining between their homes and the Proposed Project.

Recreating Population

There are several types of recreational users that would be affected by the Proposed Project including hikers on the Appalachian Trail and Mosquito Mountain; boaters and those who fish on Moxie Pond, Baker Stream, and Wyman Lake; and ATV users and snowmobilers using ITS trails 86.

There would be minor to moderate visibility of the Proposed Project from the summit areas of Pleasant Pond Mountain and Bald Mountain. Appalachian Trail hikers currently experience crossing the existing 115-kV transmission line corridor three times in proximity to Troutdale Road. Hikers expect to see the transmission line as it is noted in Trail Guides and if they park in the trailhead adjacent to the existing corridor. During Section 106 consultation with consulting parties, it was concluded that the Appalachian Trail user's experience would be enhanced by modifying the location and number of trail crossings by adjusting the trail alignment to cross the ROW once along Segment 3. The Proposed Project would negatively affect the hikers' experience and their continued enjoyment the Appalachian Trail due to the visual intrusion of the transmission line corridor.

Proposed Project views from Mosquito Mountain are seen in context with the existing 115-kV transmission line corridor both in the foreground (at the trail crossing), and the midground and background from summit overlooks. The proposed self-weathering steel HVDC structures would be seen against a wooded backdrop which would minimize their visibility. The widened corridor clearing would be visible in areas where the existing corridor is already visible. The Proposed Project would not negatively affect the public's continued use and enjoyment of Mosquito Mountain.

Expectations for visual quality among boaters on Moxie Pond, Wyman Lake, and Baker Stream are moderated by the visibility of existing development. On Moxie Pond the main areas of Proposed Project visibility would be in the southern area near Joe's Hole and near Black Narrows where the existing transmission line is already visible. On Wyman Lake, boaters and those who fish would see the Proposed Project in context with the dam, the existing transmission line, and Bingham Wind turbines. The Proposed Project would minimally affect the boating/fishing experience and would not decrease the public's continued use and enjoyment of the waterbodies.

Conclusion

Based on the range of potential visual impacts, and the VIA provided in the NRPA application (NECEC 2017, CMP 2020t, Terrence J. DeWan & Associates 2017), DOE concluded that Segment 2 would not unreasonably interfere with existing scenic and aesthetic uses and would not adversely affect scenic character in the surrounding area including in the municipalities in which it is located or in neighboring municipalities, where applicable.

Segment 3

Landscape

Color: The proposed single-pole HVDC transmission structures would be constructed of weathering steel (self-oxidizing) that would have a dark brown, rusty appearance. From most of the Segment 3 viewpoints, the difference in color would result in a relatively minor contrast with the surrounding vegetation. Where the HVDC structures are seen adjacent to the existing wooden H-frame structures, there would be a strong color contrast.

Form: Most of Segment 3 would use one type of transmission structure: a single pole structure averaging 100 feet tall which would result in a minimal to moderate contrast in form. The angle structures would consist of two poles more similar in form to the existing H-frame structures.

Line: Segment 3 is co-located with an existing transmission line therefore the proposed conductors and cleared corridor would create minimal additional line contrast. Where the proposed conductors are visible and the existing conductors are not, there would be a moderate line contrast.

Texture: The HVDC structures would be single pole self-weathering steel, which have a smoother texture than the standard wooden poles. This texture would cause a minimal contrast in texture.

Human Settlement

Motorists

The primary viewing population is the year-round residents who live or work in or near Concord Twp, Embden, Anson, Starks, Industry, New Sharon, Farmington, Wilton, Chesterville, Jay, Livermore Falls, Leeds, Greene, and Lewiston and use State Routes 201 in Moscow, Route 16 in Concord Twp and Embden, Route 8 in Anson, Route 43 in Starks, Route 2 in Farmington, Route 156 in Chesterville, Route 133 in Jay and Livermore Falls, Route 219 in Leeds, Route 100/202 in Greene and Lewiston, and the surrounding local roads. Segment 3 would include 64 road crossings.

At 39 of these crossings, motorists currently see an existing 115-kV transmission line on H-frame structures that are typically 45 feet tall within a 150-foot cleared transmission line corridor. At the remaining 25 crossings, motorists see two 115-kV transmission lines—one on wooden H-frame structures typically 45 feet in height and one on wooden single pole structures typically 75 feet in height within a 225-foot cleared transmission line corridor. The existing 150- or 225-foot wide corridors would be widened by 75 feet on the west side to accommodate the proposed HVDC transmission line corridor which would be supported on self-weathering steel structures that would be typically 100 feet in height. The Proposed Project would minimally increase the overall visual impact of the transmission line corridor as motorists cross under the lines.

Residents

There are approximately 96 homes located directly adjacent to or that have a view of the existing transmission line and proposed Segment 3. The majority are single family homes on individual lots or farmsteads in rural settings. For the most part, the homes are oriented away from the transmission line corridor. In most locations homeowners have maintained a sufficient amount of woods on their properties to provide an adequate buffer between themselves and the proposed widened corridor. In a few locations, such as along Route 16 in Concord Twp, there would be open views toward the Proposed Project because of adjacent open fields. There would be minimal to moderate visual impact on the residential properties that are adjacent to or within view of the transmission line corridor, depending on the viewing distance and amount of intervening or preserved vegetation.

Recreating Population

Existing trails are used by ATV riders, snowmobilers, and hikers throughout Segment 3. Because current users are accustomed to riding or walking in the cleared transmission line corridors and seeing transmission structures and overhead conductors, there would be minimal visual impact to recreational trail users resulting from the Segment 3 activities. Recreational boaters using the Carrabassett, Sandy, and Dead Rivers are also accustomed to viewing the existing transmission lines and adjacent open fields on either side of the corridors while using these resources.

Increasing the cleared width by 75 feet and installing HVDC transmission line structures would have moderate visual impact on canoeists and kayakers who cross under the lines and may affect the continued use and enjoyment of the rivers. The Proposed Project views for boaters on Clearwater Pond would be in the midground/background viewing distance and would not affect the continued use and enjoyment of the pond. Allen Pond is a smaller pond located within foreground viewing distances from the Proposed Project. The Proposed Project would be most visible from the southern end of the Pond where the existing transmission line is visible. The proposed HVDC transmission line would have minimal to no impact on the continued use and enjoyment of these water resources. Segment 3 would also be located adjacent to the Bowman Airfield in Livermore. The Proposed Project would be located to avoid impacts on the airfield.

Working Population

The majority of the working population within the Segment 3 viewshed are agricultural and commercial forestry workers. There are also adjacent gravel pits and smaller commercial businesses (such as RV Sales and car repair). The Proposed Project is located within the foreground of two high school campuses (Carrabec High School in Anson and Mt Blue High School in Farmington), but there would be no Proposed Project views for teachers/administrators from within the school facilities. The visual impacts on the working population in the Segment 3 area would be minimal to none.

Conclusion

Based on the range of potential visual impacts, and the VIA provided in the NRPA application (NECEC 2017, CMP 2020t, Terrence J. DeWan & Associates 2017), DOE concluded that Segment 3 would not unreasonably interfere with existing scenic and aesthetic uses and would not adversely affect scenic character in the surrounding area including in the municipalities in which it is located or in neighboring municipalities, where applicable.

3.7.2.3 Applicant Committed Measures

To minimize visual impacts from the Proposed Project, engineering designs have been chosen to mitigate each segment's potential impacts. The applicant selected its route to maximize co-location within existing transmission line corridors, and in the new corridor (Segment 1), the selected route would minimize views through the use of intervening topography and vegetation. In addition, the applicant proposes to implement the following measures to reduce impacts on visual resources:

- Management of full height vegetation or taller vegetation associated with the wildlife travel corridors (Wildlife Areas) for approximately 14.08 miles in Segment 1

- Limiting the areas that would be maintained as scrub-shrub habitat; for the remaining portions of Segment 1, approximately 39.02 miles, areas that would be maintained as scrub-shrub habitat would be limited to a width of 54 feet beneath the overhead conductors. Areas outside the 54-foot width, vegetation would be managed in a tapered configuration, increasing in height as one approaches the 150-foot corridor limit.

- Underground installation at the Upper Kennebec River using HDD, thereby avoiding visibility of the Proposed Project to users on the river

- Structures constructed of natural wood and self-weathering steel

- Reduced structure heights adjacent to Moxie Pond; limited clearing in areas adjacent to the Appalachian Trail by tapering the proposed 75 foot clearing width (27 feet beneath the overhead conductors managed as scrub-shrub and the remaining 48 feet to the edge of the clearing limits managed as tapered vegetation increasing in height).

- Allowing the existing cleared edge associated with Section 222 in areas adjacent to the Appalachian Trail to grow into a tapered configuration

- Use of non-specular (non-reflective) conductor within the viewshed of Coburn Mountain, Rock Pond, Moxie Stream, and the Appalachian Trail

- Tapered vegetation management within the viewshed of Rock Pond and Coburn Mountain

- Preservation of riparian vegetation

- Maintenance of vegetation at minimum height of 35 feet within 100 feet of Moxie Stream

- Maintenance of roadside vegetation and buffer plantings at Troutdale Road in Bald Mountain Township, and Route 201 in Johnson Mountain Township and Moscow

- Maximizing structure setbacks from roads and streams

The only nationally significant feature affected by the Proposed Project is the Appalachian Trail. Impacts to the Appalachian Trail are limited to minor visual resource impacts. Visual impacts on the Appalachian Trail would be mitigated through the implementation of the treatment plan in a MOA with the USACE, DOE, NPS, and Maine State Historic Preservation Office (SHPO) (USACE et al. 2020: Section 10.3) which includes vegetation tapering, shorter transmission line structures, buffer plantings, partial relocation of the trail, and a reduction of Appalachian Trail crossings of the transmission line ROW from three to one.

The applicant evaluated site specific means to minimize impacts that included proposing to use 100-foot tall steel poles that can be placed farther apart than typical H-Frame structures, site-specific adjustments to structure locations, use and location of temporary roads (versus construction of permanent access roads), and substation design. The proposed use of taller structures reduces the number of poles that need to be placed, the amount of temporary construction roads that would need to be created, and the number of poles located in wetlands.

Two main mitigation strategies have been employed in the development of the site plans for the new and improved substations to reduce their potential visual impact and achieve a harmonious balance between the facilities and the surrounding landscape. These include upgrading existing substations within the existing facility footprint which minimizes the need for additional clearing. A detailed planting plan would be prepared by the Proposed Project landscape architect. The plan would consider specific site conditions to determine the optimum plant species mix. The proposed new Merrill Road Converter Station has been sited to avoid visibility from public roads. The preserved vegetation around the station would screen it from view from Merrill Road.

MDEP regulations have standards pertaining to scenic impacts that must be satisfied in order to obtain a permit. The applicant submitted a detailed Visual Impact Assessment (Terrence J. DeWan & Associates 2017) that examined the potential scenic impacts of the transmission line and related substation upgrades and included photo-simulations from multiple key observation points. This information was subjected to intense examination and cross-examination through the state hearing, including its public hearing. The MDEP concluded that the Proposed Project would not have an unreasonable adverse effect on scenic uses or character of the surrounding area after considering available and practicable mitigation measures such as site-specific clearing restrictions, shorter pole heights, and non-reflective cables. The USACE found the MDEP's conclusions to be reasonable and reflective of the detailed analysis of these effects in the administrative record.

3.8 Socioeconomics

3.8.1 Affected Environment

The analysis area for socioeconomics is Androscoggin, Franklin, and Somerset counties. A description of the existing conditions for population and housing; labor, employment, and income; taxes and revenue; and tourism for the analysis area is discussed below.

Auburn is the county seat for Androscoggin County, Farmington is the county seat for Franklin County, and Skowhegan is the county seat for Somerset County. Based on population data from the U.S. Census Bureau, Androscoggin County is currently the fifth largest county in Maine in population, Somerset County is ninth, and Franklin County is fifteenth.

The 2017 population for Androscoggin County was estimated at 107,399 (USCB 2017), which is a 0.3 percent decrease from the population of 107,709 in 2010 (USCB 2010a). Franklin County had a population estimated at 29,799 in 2017. This was a decrease in population from the population (30,767) in 2010 (USCB 2010b). Somerset County also experienced a decrease in population, with an estimated population of 52,222 in 2010 and 50,351 in 2017 (USCB 2010c). Population data for Androscoggin, Franklin, and Somerset Counties are shown in Table 3.8-1.

Table 3.8-1. Population Data for Androscoggin, Franklin, and Somerset Counties

Location	2010	2017	2010–2017 Population Change	2010–2017 Population Percent Change
United States	308,758,105	324,985,539	16,227,434	5%
Maine	1,328,358	1,334,612	6,254	0.5%
Androscoggin County	107,709	107,399	-310	-0.3%
Franklin County	30,767	29,799	-968	-3.0%
Somerset County	52,222	50,351	-1,871	-4.0%

Source: USCB 2010a, 2010b, 2010c, 2017

In 2017, Androscoggin County contained approximately 49,616 total housing units, of which 8.8 percent were vacant. Franklin County contained approximately 22,068 housing units in 2017, of which 47.5 percent were vacant. Somerset County contained approximately 30,801 housing units in 2017, of which 30.5 percent were vacant (USCB 2017). The Census Bureau did not have data available on the homeowner vacancy and rental vacancy rates for these counties.

3.8.1.1 Employment and Income

In 2017, the unemployment rate in Androscoggin, Franklin, and Somerset counties was higher (3.4 percent, 3.7 percent, and 5.1 percent, respectively) than the State of Maine (3.3 percent). As indicated in the table below, the unemployment rate in Androscoggin and Franklin counties, and the State of Maine was lower than the United States (4.1 percent) in 2017. However, the unemployment rate for Somerset County was higher (5.1 percent) than the United States (4.1 percent). Employment data for Androscoggin, Franklin, and Somerset Counties are shown in Table 3.8-2.

Table 3.8-2. Employment Data for Androscoggin, Franklin, and Somerset Counties

Industry	United States	Maine	Androscoggin County	Franklin County	Somerset County
Population 16 years and over	255,797,692	1,104,528	86,257	25,265	42,185
In labor force	63.4%	63.1%	65.5%	60.9%	57.8%
Employed	58.9%	59.6%	62.1%	57.1%	52.7%
Unemployed	4.1%	3.3%	3.4%	3.7%	5.1%
Not in labor force	36.6%	36.9%	34.5%	39.1%	42.2%

Source: USCB 2017.

The median household income in Androscoggin County, Franklin County, and Somerset County was $49,538, $45,541, and $41,549, respectively, in 2017. The median household income for the State of Maine was $53,024, and $57,652 for the United States. The median household income in Androscoggin, Franklin, and Somerset counties was thus 7 percent, 14 percent, and 22 percent lower, respectively, than the State of Maine. As indicated in the Table 3.8-3, in 2017, each of the three counties had a larger percentage of service occupations, and production, transportation, and material moving occupations than the State of Maine. Androscoggin County had a higher percentage of sales and office occupations in comparison to the state, and Somerset and Franklin counties each had a higher percentage of natural resources, construction, and maintenance occupations than the State of Maine. Income data for Androscoggin, Franklin, and Somerset Counties are shown in Table 3.8-3.

Table 3.8-3. Income Data for Androscoggin, Franklin, and Somerset Counties

Occupation	United States	Maine	Androscoggin County	Franklin County	Somerset County
Civilian employed population 16 years and over	150,599,165	658,693	53,532	14,426	22,217
Median Household Income	$57,652	$53,024	$49,538	$45,541	$41,549
Management, business, science, and arts	37.4%	36.6%	33.2%	32.0%	27.4%
Service	18.0%	18.3%	19.3%	20.4%	18.5%
Sales and office	23.5%	23.2%	23.5%	22.3%	22.8%
Natural resources, construction, and maintenance	8.9%	10.7%	9.8%	12.7%	14.5%
Production, transportation and material moving	12.2%	11.2%	14.1%	12.5%	16.9%

Source: USCB 2017.

3.8.1.2 Taxes and Revenue

The largest employer in Maine is Maine Health, followed by Hannaford Bros Co., Walmart/Sam's Club, Bath Iron Works Corp., and Eastern Maine Medical Center. The largest industry in Androscoggin, Franklin, and Somerset counties is health care.

The combined sales tax in the region is 5.5 percent. Maine imposes an income tax on all entities organized as corporations and that have Maine-source income. The corporate income tax is graduated, with rates ranging from 3.5 percent (for income up to $350,000) to 8.93 percent (for income in excess of $3,500,000). For year-end 2017, Androscoggin County had a total general revenue of $12,586,100, of which $9,108,796 was generated from taxes (Androscoggin County Treasurer's Office 2017). Franklin County had a total general revenue of $6,464,224 in 2017, of which $5,299,164 was generated from taxes (Franklin County Treasurer's Office 2017). Somerset County had general revenues of $16,611,118 in 2017, with $12,340,408 generated from taxes (Somerset County Treasurer's Office 2017).

3.8.1.3 Tourism

Tourism is one of Maine's largest industries, supporting nearly 110,000 jobs and about 16 percent of the employment in the state (Maine Office of Tourism 2018). Tourism in the state is largely focused on the beaches, coast, and lakes, mountains, nature and wildlife, and outdoor recreational activities. Based on 2018 data from the U.S. Travel Association, domestic and international travelers to Maine spent $4.5 billion in 2018 and generated $553.8 million to federal, state, and local governments. Travelers to Maine generated 35,790 jobs, which represented 6.9 percent of Maine's total private industry employment in 2018. The Kennebec Valley region, which hosts Androscoggin and Somerset counties, had an estimated 2.78 million travelers visit in 2018, which was a 6.2 percent increase over 2017 (Maine Office of Tourism 2019). Kennebec Valley visitors spent $304.3 million in 2018, up 2.1 percent from 2017 (Maine Office of Tourism 2019). The Maine Lakes and Mountains region, which consists of Androscoggin County and Franklin County, had an estimated 4.93 million travelers visit in 2018, which represents a 2.4 percent increase over 2017. Visitors to the Maine Lakes and Mountains region spent $670.5 million in 2018, roughly equivalent to 2017 spending.

3.8.2 Environmental Consequences

3.8.2.1 Impact Analysis Area and Indicators

The analysis area for socioeconomic impacts is Androscoggin County, Franklin County, and Somerset County. No changes to population and demographics, housing, or tourism are anticipated from the construction and operation and maintenance of the Proposed Project. Therefore, there are no impact indicators for these socioeconomics components. In terms of potential socioeconomic impacts, there would be a potential change in local taxes and revenues, as well as employment. Therefore, the following indicators were considered when analyzing impacts on socioeconomics:

- **Employment and Income**: Increase in employment during construction, or operation and maintenance.
- **Taxes and Revenue**: Increase in local government tax revenues.

3.8.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, a Presidential permit would not be issued to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in Maine, and the potential socioeconomic impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Population and Housing

The applicant has stated that construction of the Proposed Project would require approximately 785 temporary construction workers per year during the construction period. Preference would be given whenever possible to local Maine workers. Contractors have been interacting with local hotels to secure housing for workers during the construction phase. The operation and maintenance of the Proposed Project would support an average of 21 jobs per year that would directly support the maintenance and operations. Based on employment estimates the newly developed and expanded ROWs would not result in adverse changes to population, demographics, or the availability of housing.

Employment and Income

Construction of the Proposed Project would temporarily increase employment with the addition of approximately 785 construction jobs during the construction phase of the Proposed Project (CMP 2020h). The operation and maintenance of the Proposed Project facilities would require an average of 21 new permanent employees. With the addition of temporary jobs during construction and permanent jobs post construction, the Proposed Project would have temporary and long-term beneficial impacts on employment and income in the area.

Positive economic benefits would accrue to Maine from the development, construction, and operation of the Proposed Project. The applicant stated that the Proposed Project would result in an increase in approximately 1,600 jobs per year average during the construction phase, including direct (i.e., project) workers and indirect workers (CMP 2020h). Construction of the Proposed Project would likely not require workers from outside the region to relocate to Maine. Because the Proposed Project largely would support employment of Maine residents, with large contracts focused on Maine companies and companies with a Maine presence, significant changes in population and availability of housing are not anticipated. Therefore, there are no impact indicators for these socioeconomics components.

Taxes and Revenue

Transmission infrastructure investments in the Proposed Project are expected to increase municipal property valuations. Based on existing mill rates and an assumed total capital expenditure of $1 billion, a total of $18 million of additional municipal tax revenue resulting from Proposed Project infrastructure is estimated to be contributed on an annual basis beginning once the investments are fully reflected in property valuations.

Revenues would also be created during the construction phase through payroll taxes, sales and use taxes on equipment and materials, and other indirect taxes such as lodging taxes. Taxes and revenue would be generated by the construction of the Proposed Project from the purchase of building materials and other goods and services and the wages paid to construction workers. The injection into the economy of this money would have a multiplier effect, supporting additional new spending by the initial recipients (e.g., construction workers, suppliers, and business owners). Wages earned at the businesses who provide the goods, materials, and services would potentially be used by business owners and employees for their own subsequent purchases. This direct and indirect economic activity would therefore represent a positive contribution to the local community’s economic well-being. In addition, the Proposed Project would contribute to local taxes and revenue associated with property taxes, property leases, fees, and real estate purchases and transfers. The increase in taxes and revenue generated by the construction and operation of the Proposed Project would be a beneficial impact to local governments that rely on these sources of tax revenue, such as school districts.

Tourism

Land uses in the area of the Proposed Project generally include forestry, agriculture, residential / commercial / industrial, transportation, recreation, conservation, historical, and natural features such as rivers, lakes, wetlands, and wildlife habitat areas. These uses would continue during the construction, operation, and maintenance of the transmission lines and associated facilities. The proposed newly developed Segment 1 and the proposed expanded Segment 2 and Segment 3 are not anticipated to result in adverse changes to tourism. Although there are outdoor recreational activities that attract tourism, MDEP has determined in the MDEP Order that the Proposed Project would not impose limitations on recreational activities such as hunting, fishing, hiking, and snowmobiling (MDEP 2020: Page 57). Specifically, and after extensive live and written testimony on the scenic, aesthetic, and recreational impacts of the Proposed Project, MDEP found in the MDEP Order that outdoor recreationalists and tourists would continue to be able to cross the corridor and access the same areas they have traditionally used (MDEP 2020: Page 57).

The MDEP Order includes a requirement that the width of the cleared corridor in Segment 1—originally proposed to be 150 feet—would be 54 feet at its widest point, and found that this width as well as the manner in which vegetation is managed in Segment 1 would minimize any adverse impacts such that there would be no unreasonable adverse impact on existing uses in the area. The remainder of the transmission line in Segment 2 and Segment 3 would be co-located either within or immediately adjacent to an existing corridor, and thus would have no unreasonable adverse impact on existing uses in the area.

3.8.2.3 Applicant Committed Measures

The Proposed Project would contribute to the state's gross domestic product and employment during construction, increase property tax revenues for host communities, and provide additional benefits based on the commitments that the applicant agreed to in the MPUC CPCN proceedings, Docket No. 2017-00232 (MPUC 2020). The applicant assumed numerous commitments in connection with the MPUC CPCN proceedings, including investing in economic development and promotion of regional tourism, as well as support for recreational infrastructure (MPUC 2020).

From these and other commitments, the Proposed Project would provide an estimated $250 million in community-based benefits. These benefits would consist primarily of direct cash payments that would be paid to various beneficiaries over the life of the Proposed Project. In addition to the direct payments, benefits would include $2.5 million in transmission and decarbonization studies and an estimated $5 million in equipment and facilities to provide additional fiber optic capacity on the HVDC transmission line.

3.9 Environmental Justice

3.9.1 Affected Environment

This section provides demographic information on minority and low-income populations, which include populations for consideration of potential environmental justice impacts. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to "promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment."

EO 12898 also directs agencies to identify and consider any disproportionately high and adverse human health or environmental effects that its actions might have on minority and low-income communities

(collectively, the environmental justice populations) and provide opportunities for community input when such communities are identified within the analysis area.

The environmental justice data below represent the geographic extent in which project-specific effects on minority and low-income populations would occur. The analysis area for environmental justice consists of 14 Census Tracts in Androscoggin, Franklin, and Somerset counties (see Figure 3.9-1). The analysis area is analogous to the "affected area" in the Federal Interagency Working Group on Environmental Justice guidance (FIWGEJ 2016). The region of comparison consists of Androscoggin, Franklin, and Somerset counties. The region of comparison is analogous to the "reference area" in the same guidance (FIWGEJ 2016). Data for the general U.S. population and Maine are also included for context, to provide a wider scope of comparison, but were not used to identify environmental justice populations.

3.9.1.1 Minority Populations

Minority populations are those identified in the census data as American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; Hispanic; some other race; or two or more races (CEQ 1997). The U.S. Census Bureau defines "white" as a "person having origins in any of the original peoples of Europe, the Middle East, or North Africa." Communities defined as "white" are not considered an environmental justice population. Minority communities may be defined where either: 1) the minority population in the analysis area exceeds 50 percent, or 2) the minority population percentage of the analysis area is meaningfully greater than the minority population in the reference area (USEPA 1994).

Table 3.9-1 provides the minority population statistics of Androscoggin, Franklin, and Somerset counties in comparison to the minority population statistics of the State of Maine and general U.S. population. As shown in the table, the percentage of minorities in Maine is small, comprising approximately 7 percent of the state population according to the U.S. Census Bureau, 2013–2017 American Community Survey 5-Year Estimates (USCB 2017).

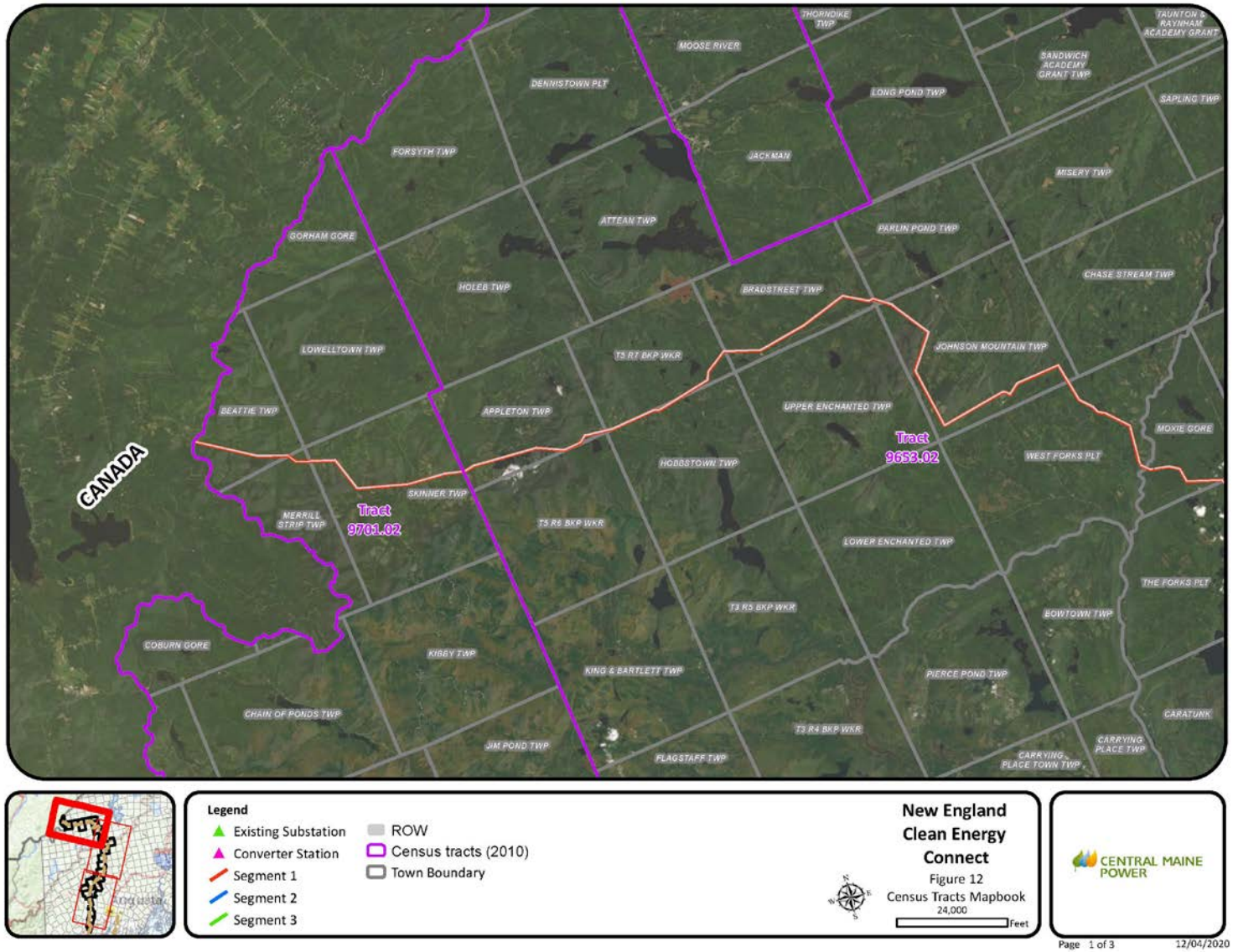
Table 3.9-1. Minority Statistics in the U.S., Maine, and Androscoggin, Franklin, and Somerset Counties

	United States	Maine	Androscoggin County	Franklin County	Somerset County
Total Population	321,004,407	1,330,158	107,317	30,177	50,994
Race (Percent of Total Population)					
White	75.7%	96.7%	96.9%	98.3%	98.7%
Black or African American	13.9%	1.8%	2.8%	0.8%	0.9%
American Indian and Alaskan Native	1.7%	1.7%	4.0%	1.4%	1.3%
Asian	6.3%	1.6%	1.4%	0.8%	0.9%
Native Hawaiian and Other Pacific Islander	0.4%	0.1%	0.1%	0.2%	0.1%
Some other race	5.4%	0.3%	0.3%	0.4%	0.1%
Hispanic or Latino and Race					
Hispanic or Latino origin (of any race)	17.6%	1.5%	1.8%	1.3%	1.0%
White Alone, not Hispanic or Latino	82.4%	98.5%	98.2%	98.7%	99.0%

Source: USCB 2017.

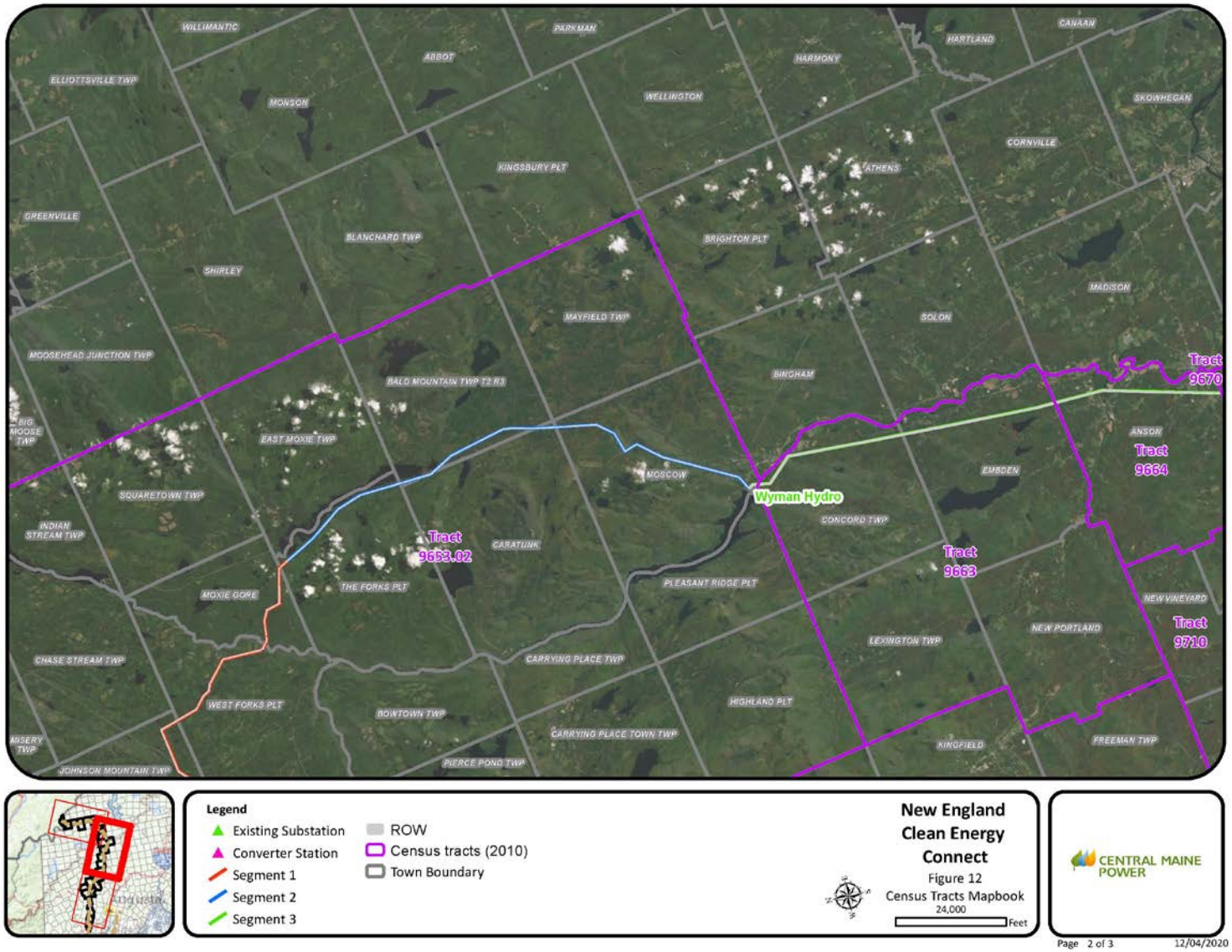
The largest minority population within one of the affected counties was identified as American Indian and Alaska Native, which comprises 4.0 percent of the Androscoggin County population. More specific

minority population statistics from the Androscoggin Census Tracts are described in Table 3.9-2. The Census Tracts in the analysis area were identified using the U.S. Census Bureau 2010 Census Tract Reference Map for Androscoggin, Franklin, and Somerset counties as shown on Source: CMP, December 2020.



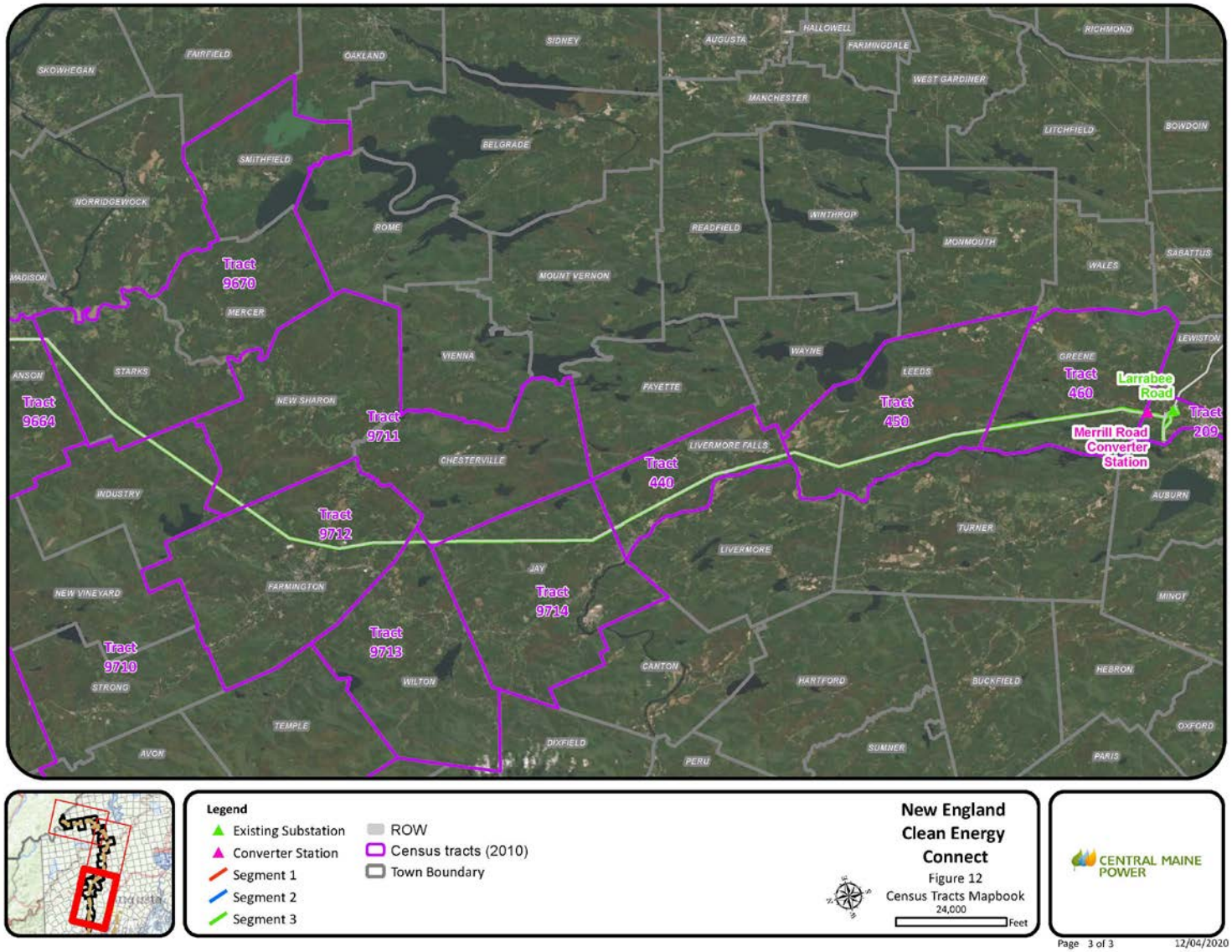
Source: CMP, December 2020.

Figure 3.9-1. Census Tracts Mapbook



Source: CMP, December 2020.

Figure 3.9-2. Census Tracts Mapbook cont.



Source: CMP, December 2020.

Figure 3.9-3. Census Tracts Mapbook cont.

Table 3.9-2 through Table 3.9-4 provide the minority population statistics by county and Census Tracts traversed by the Proposed Project.

Table 3.9-2. Minority Statistics for Census Tracts in Androscoggin County

	Androscoggin County	Census Tract 206	Census Tract 208	Census Tract 209	Census Tract 440	Census Tract 450	Census Tract 460
Total Population	107,317	2,566	7,804	4,803	3,134	2,300	4,354
Race (Percent of Total Population)							
White	96.9%	99.4%	95.5%	95.7%	100%	99.1%	99.7%
Black or African American	2.8%	0.2%	4.0%	5.0%	0.1%	0.0%	2.2%
American Indian and Alaskan Native	4.0%	2.2%	3.5%	2.2%	2.9%	1.9%	3.8%
Asian	1.4%	1.0%	3.2%	1.7%	0.0%	0.0%	0.3%
Native Hawaiian and Other Pacific Islander	0.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
Some other race	0.3%	0.6%	0.0%	0.4%	0.0%	0.5%	0.0%
Hispanic or Latino and Race							
Hispanic or Latino origin (of any race)	1.8%	4.3%	0.0%	2.2%	2.60%	1.30%	2.70%
White alone, not Hispanic or Latino	98.2%	95.7%	100%	97.8%	97.40%	98.70%	97.30%

Source: USCB 2017.

Census Tracts 206 and 208 in Androscoggin County are outside the analysis area and located east of census tract 209 in Lewiston. However, they were included in Table 3.9-2, because Androscoggin County contains the largest percentage minority population of the three counties in the analysis area (American Indian and Alaska Native represents 4 percent of the Androscoggin County population). Work associated under the Proposed Project in census tract 209 includes the proposed new Merrill Road Converter Station and existing Larrabee Substation. Census Tracts 206 and 208 in Androscoggin County were included for purposes of comparison to census tract 209 due to their proximity to existing CMP transmission infrastructure, which traverses south through Androscoggin County, and to demonstrate that the minority population in census tract 209 is not meaningfully greater than the minority populations in nearby census tracts (CMP 2020i).

Table 3.9-3. Minority Statistics for Census Tracts in Franklin County

	Franklin County	Census Tract 9701.02	Census Tract 9710	Census Tract 9711	Census Tract 9712	Census Tract 9713	Census Tract 9714
Total Population	30,177	695	4,449	3,024	7,623	4,008	4,684
Race (Percent of Total Population)							
White	98.3%	99.4%	99.1%	99.9%	97.9%	97.3%	96.90
Black or African American	0.8%	0.0%	2.1%	0.3%	0.8%	0.3%	1.3%
American Indian and Alaskan Native	1.4%	0.3%	1.3%	1.3%	0.1%	0.9%	3.9%
Asian	0.8%	0.0%	0.5%	0.2%	0.5%	3.5%	0.4%

	Franklin County	Census Tract 9701.02	Census Tract 9710	Census Tract 9711	Census Tract 9712	Census Tract 9713	Census Tract 9714
Native Hawaiian and Other Pacific Islander	0.2%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%
Some other race	0.4%	0.6%	0.0%	0.1%	0.7%	0.0%	1.5%
Hispanic or Latino and Race							
Hispanic or Latino origin (of any race)	1.3%	0.0%	1.8%	0.0%	1.7%	0.7%	1.5%
White alone, not Hispanic or Latino	98.7%	100%	98.2%	100%	98.3%	99.3%	98.5%

Source: USCB 2017.

Table 3.9-4. Minority Statistics for Census Tracts in Somerset County

	Somerset County	Census Tract 9653.02	Census Tract 9663	Census Tract 9664	Census Tract 9670
Total Population	50,994	1,216	1,873	2,638	2,137
Race (Percent of Total Population)					
White	98.7%	97.8%	98.1%	100.0%	99.3%
Black or African American	0.9%	0.0%	0.9%	0.0%	0.5%
American Indian and Alaskan Native	1.3%	3.0%	1.8%	3.0%	1.5%
Asian	0.9%	0.0%	0.4%	0.0%	0.2%
Native Hawaiian and Other Pacific Islander	0.1%	0.0%	0.4%	0.0%	0.2%
Some other race	0.1%	0.0%	0.1%	0.0%	0.0%
Hispanic or Latino and Race					
Hispanic or Latino origin (of any race)	1.0%	0.2%	0.1%	0.00%	1.9%
White alone, not Hispanic or Latino	99.0%	99.8%	99.9%	100.0%	98.1%

Source: USCB 2017.

The minority population in the analysis area does not exceed 50 percent and the minority population percentage of the analysis area is not meaningfully greater than the minority population in the general population. In addition, aggregation of all minority populations within the analysis area does not result in meeting one of the above standards. The total population of the census tracts in the aggregate is approximately 46,938 people. Aggregation of the minority populations within these census tracts totals approximately 2,379 people, or approximately 5 percent of the total affected census tract population (USCB 2017). Accordingly, the minority populations within the analysis area do not constitute an environmental justice population.

3.9.1.2 Low-income Populations

Low-income populations are identified as individuals and families that are living at or below the U.S. Department of Health and Human Services poverty guidelines. *Low income*, as defined by the poverty guidelines for 2017, was $12,060 for an individual and $24,600 for a family of four (HHS 2017). The U.S. Census Bureau defines poverty-level thresholds for individuals and a family of four as income levels

below $12,488 and $25,094, respectively (USCB 2017). Poverty thresholds do not vary geographically but are updated annually for inflation using the Consumer Price Index.

Table 3.9-5 describes the low-income population statistics for the analysis area, using 2017 data. The 2017 median household income of families in the counties affected by the Proposed Project ranged from $29,868 to $66,303. Families identified as living below the poverty level ranged from 16.3 percent (Census Tract 9701.02) in Franklin County, 15.7 percent (Census Tract 440) in Androscoggin County, and 10.1 percent (Census Tract 9653.02) in Somerset County, although the county level was greater at 12.6 percent.

The median household income in each of the affected census tracts is above both the 2017 U.S. Department of Health and Human Services poverty guidelines and the U.S. Census Bureau poverty-level thresholds. The per-capita income within each of the affected census tracts also exceeds both the 2017 U.S. Department of Health and Human Services poverty guidelines and the U.S. Census Bureau poverty-level thresholds for individuals (Table 3.9-5). Accordingly, since there is not a low-income population within the analysis area, there is not an environmental justice population under this criterion.

Table 3.9-5. Income Statistics for Census Tracts

	Characteristic			
County/Census Tract	**Median household income**	**Per-capita income**	**Percent below poverty level (individuals)**	**Percent below poverty level (families)**
Androscoggin County	$49,538	$26,276	26.1%	9.5%
Census Tract 209	$45,403	$19,854	30.1%	11.7%
Census Tract 440	$29,868	$18,175	41.7%	15.7%
Census Tract 450	$53,705	$23,165	24.7%	9.9%
Census Tract 460	$66,303	$28,886	25.6%	1.9%
Franklin County	$45,541	$24,162	28.1%	7.6%
Census Tract 9701.02	$41,458	$24,033	28.9%	16.3%
Census Tract 9710	$41,116	$22,562	30.7%	8.5%
Census Tract 9711	$47,661	$23,452	30.4%	7.5%
Census Tract 9712	$40,150	$22,311	26.4%	8.4%
Census Tract 9713	$41,915	$23,986	33.6%	4.9%
Census Tract 9714	$59,769	$25,427	29.9%	7.1%
Somerset County	$41,549	$22,641	32.3%	12.6%
Census Tract 9653.02	$32,944	$20,269	39.3%	10.1%
Census Tract 9663	$46,042	$29,137	26.6%	8.3%
Census Tract 9664	$42,228	$19,905	24.2%	9.0%
Census Tract 9670	$47,917	$26,010	24.3%	7.7%

Source: USCB 2017.

3.9.2 Environmental Consequences

3.9.2.1 Impact Analysis Area and Indicators

The impact analysis area for impacts on environmental justice comprises the 14 census tracts in the analysis area that the Proposed Project intersects as listed below:

- Androscoggin County
  - Census Tracts 209, 440, 450, and 460
- Franklin County
  - Census Tracts 9701.02, 9710, 9711, 9712, 9713, and 9714
- Somerset County
  - Census Tracts 9653.02, 9663, 9664, and 9670

The following indicators are considered when assessing impacts on environmental justice communities:

- Proximity of the Proposed Project to an environmental justice population (as defined in Section 3.9.1.1, *Minority Populations*, and Section 3.9.1.2, *Low-income Populations*); and qualitative discussion describing any potential high and disproportionate adverse socioeconomic or environmental effects on environmental justice communities in the analysis area.

3.9.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, a Presidential permit would not be issued to the applicant for the Proposed Project, the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in Maine, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Minority Populations and Low-income Populations

Segment 1 is the only proposed new transmission corridor, extending 53.5 miles in undeveloped ROW from the Canadian Border in Beattie Township to intersect with the existing Section 222 corridor in The Forks Plantation. Segment 1 intersects census tracts 9701.02 and 9653.02, the two least populated census tracts in the analysis area (Table 3.9-5).

Segment 2 would extend approximately 21.9-miles along an existing corridor that would be expanded to include a new transmission line from the intersect with the Section 222 corridor to the Wyman Substation in Moscow. This segment intersects a portion of census tract 9653.02, the second smallest population in the analysis area.

Segment 3 would extend 71.1 miles along an existing corridor that would be expanded to include a new transmission line from the Wyman Substation to the proposed new Merrill Road Converter Station in

Lewiston, constructing 1.2 miles of new transmission line from the proposed new Merrill Road Converter Station to the existing Larrabee Road Substation, and a rebuild of 0.8 miles of 34.5 kV transmission line outside of the Larrabee Road Substation. Segment 3 intersects the remaining 12 census tracts 9663, 9664, 9670, 9710, 9711, 9712, 9713, 9714, 440, 450, 460, and 209.

As described in Section 3.9.1.1, *Minority Populations*, the minority populations within the analysis area do not constitute an environmental justice population and would not be subject to disproportionately high and adverse human health or environmental effects associated with the Proposed Project.

In addition, median household and per-capita incomes in the analysis area are above both the 2017 U.S. Department of Health and Human Services poverty guidelines and the U.S. Census Bureau poverty-level thresholds. As such, the Proposed Project would not result in a disproportionately high and adverse human health or environmental effects to an environmental justice population.

Following is a qualitative discussion describing potential adverse socioeconomic or environmental effects in the analysis area.

Land Use

As stated in Sections 3.9.1.1, *Minority Populations,* and 3.9.1.2, *Low-income Populations*, the minority and low-income populations within the analysis area do not satisfy the criteria of an environmental justice population. Any potential impacts associated with the Proposed Project, would likely be minimal visual or noise impacts associated with construction activities or operation of the Proposed Project in or adjacent to areas where minority or low-income households are located. However, all persons, regardless of race or income, would experience these same impacts associated with the Proposed Project. These impacts would be minimal given the largely rural nature of the Proposed Project. Where the Proposed Project would be near residential areas, there are few residences in the vicinity, and development is sparse. Any inconveniences associated with construction would be short-term for the residences and businesses located adjacent or within close proximity to the Proposed Project, and long-term impacts would be minimal. Land uses in the vicinity of the Proposed Project would continue uninterrupted during the construction, operation, and maintenance of the transmission lines and the associated facilities. No displacement of residences or businesses would occur as a result of the Proposed Project, so there would be no disproportionately high or adverse impacts on low-income or minority populations in the affected census tracts that would be created by the Proposed Project with regard to land use.

Visual

Visual impacts resulting from the Proposed Project would not be specific to low-income or minority populations. The Proposed Project route would maximize co-location within existing transmission line corridors. Other mitigation measures to preserve visual resources and reduce visual impact are discussed in Section 3.7, *Visual Resources*. Because the low-income and minority populations within the affected census tracts are consistent with those populations in the general population, visual impacts would not have a disproportionate impact on those populations within the analysis area.

Socioeconomics

There would be no displacement of residences or businesses, or permanent changes to access to such properties as a result of the Proposed Project (CMP 2020i). Access to all properties, including residences, businesses, and public facilities, would be maintained during construction and operation of the Proposed Project. No adverse impacts on employment opportunities or income would occur. Rather, the Proposed Project would contribute to the state's gross domestic product and employment during construction as well as increase property tax revenues for host communities. There would be no adverse or disproportionate impacts on low-income or minority populations from a socioeconomic standpoint.

Air Quality

The minority and low-income populations in the affected census tracts would not be disproportionately affected by short-term air quality impacts as a result of the Proposed Project (see Section 3.11, *Air Quality and Climate Change*). Temporary minor influences on air quality due to construction may occur from construction personnel commuter traffic, exhaust from construction vehicles, and temporary dust generated by construction activities. Fugitive dust is expected only at substation construction sites and along unpaved construction access roads. Applicant proposed measures would minimize emissions of fugitive dust.

Given the limited duration of these activities at any one location, and the rural nature of the analysis area, influences on overall air quality would not specifically affect minority or low-income populations in the analysis area.

Noise

As discussed in Section 3.12, *Noise*, the selected conductor sizes are designed to be nearly noise free. Corona discharges (and associated audible noise) would be minimized by the applicant proposed measures. All sound levels produced by new and/or upgraded transmission lines and substations would remain within MDEP allowable levels. Noise generated from construction activities would be short-term and occur primarily during daylight hours. Any noise resulting from the Proposed Project would not be significant or disproportionately affect minority or low-income populations in the analysis area.

Infrastructure

As discussed in Section 3.13, *Infrastructure*, during construction, there would be short-term effects from increased construction traffic, temporary lane closures, and/or traffic delays. Access to all properties, including public facilities, schools, and social service agencies, would be maintained during construction, and local agencies and residents would be notified of upcoming construction activities and potential disruptions to transportation facilities.

The minority populations in the affected census tracts would not be disproportionately affected in terms of access to public services during construction or operation of the Proposed Project. There would be no permanent impact in terms of access to public services associated with the Proposed Project.

The Proposed Project is consistent with the existing infrastructure in the Proposed Project area. Portions of the Proposed Project are proposed to be located in predominantly forested areas that are remote, actively managed, and already subject to forest harvesting activity. A large portion of the Proposed Project would be within an existing transmission line corridor. Any impacts associated with the substations would be minimal and also compatible with existing infrastructure. There would be no adverse or disproportionate impacts on low-income or minority populations related to infrastructure.

Human Health and Safety

The Proposed Project does not pose a threat to public health and safety. Public services such as police, fire, and medical facilities would be needed only in cases of emergency. As discussed in Section 3.14, *Human Health and Safety*, the applicant proposed measures, including a vegetation management plan, routine inspection of the lines, use of transmission line materials designed to reduce the risk of fire, and use of select conductors to reduce Corona discharges (i.e., small amounts of ozone), would reduce the potential for Human Health and Safety impacts. In addition, the Proposed Project would be constructed, operated, and maintained to meet or exceed all applicable safety standards.

In summary, no disproportionately high or adverse impacts on environmental justice communities in the analysis area would be created by the Proposed Project.

3.9.2.3 Applicant Committed Measures

When the following applicant proposed measures are incorporated into the construction, operation, and maintenance of the Proposed Project, impacts on environmental justice populations would be minimized:

- Maintain access to all businesses, residences, and public facilities during construction.
- Notify local agencies, residences, and business owners of upcoming construction activities and potential disruptions associated with the Proposed Project.
- Develop and implement the following: Emergency Preparedness and Response Plan; Fire Protection Plan; Environmental, Health, and Safety Management Plan; Traffic and Transportation Management Plan.

3.10 Historic and Cultural Resources

3.10.1 Affected Environment

Cultural resources are past and present expressions of human culture and history in the physical environment. They represent physical locations of human activity, occupation, or use and can refer to historical or architectural objects, sites, structures, or places with potential public and scientific value, including locations of traditional cultural, ethnic, or religious significance to a specific social or cultural group. Fragile and irreplaceable, cultural resources represent an integral part of American heritage that is identified through field inventories, historical documentation, or oral histories. Cultural resources are located, classified, ranked, and managed to identify, protect, and utilize them for public benefit.

The National Historic Preservation Act of 1966 (NHPA), as amended, established the Advisory Council on Historic Preservation (ACHP), SHPOs, and the National Register of Historic Places (NRHP) and mandates that federal agencies consider an undertaking's effects on cultural resources that are listed or eligible for listing on the NRHP (see 36 CFR 800). Historic properties are a set of cultural resources that meet specific eligibility criteria for listing in the NRHP. Used in this context, the words "historic properties" have no connotation of age or cultural affiliation and refer only to cultural resources that are listed on, determined eligible for listing on, or may be eligible for listing in the NRHP. Historic properties are managed as directed by 36 CFR 800, Protection of Historic and Cultural Properties. The historic preservation laws mandating the protection and treatment of historic properties specifically identify eligibility for inclusion in the NRHP as the key factor in determining preservation needs.

The ACHP is authorized by Section 211 of the NHPA to issue regulations to govern the implementation of Section 106 of the NHPA. These regulations, "Protection of Historic Properties" (36 CFR Part 800), establish the process that federal agencies must follow in order to consider the effects of their undertakings on historic properties and provide the ACHP its required opportunity to comment. Section 106 establishes a four-step review process by which historic properties are given consideration during the conduct of federal undertakings, and requires that agencies consult with the SHPO and/or Tribal Historic Preservation Office (THPO) to determine if the agency's undertaking could affect historic properties.

In addition to the NHPA, other relevant federal historic preservation laws include, but are not limited to, the Antiquities Act of 1906 (16 U.S.C. 431–433), the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa–mm), and National Trails System Act of 1968 (P.L. 90-543 as amended through P.L. 111-11, March 30, 2009), American Indian Religious Freedom Act of 1978, the Native American Graves Protection and Repatriation Act, EO 13007, and EO 13175. NEPA states that federal agencies will take

into consideration impacts on the natural environment with respect to an array of resources, and that alternatives must be considered. The courts have made clear that cultural resources are regarded as part of the natural environment.

For the purposes of analysis, historic properties have been organized into prehistoric and historic resources; however, when being discussed in a general sense, the term "cultural resources" is used throughout this document. Prehistoric resources are any material remains of human life or activities that represent a time before Euro-Americans established a presence in the planning area. Historic resources include material remains and landscape alterations that have occurred since the arrival of Euro-Americans, including those associated with Native Americans. Traditional cultural properties are places associated with the cultural practices or beliefs of living communities that are rooted in the community's history and are important in maintaining cultural identity.

3.10.1.1 Analysis Area

The analysis area for historic and cultural resources is defined as the Area of Potential Effect (APE). The APE specifically covers "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." (36 CFR 800.16(d)). The APE for the Proposed Project is a 0.8 kilometer (km) or 0.5-mile buffer on each side of the Proposed Project centerline as well as around converter and substation footprints. This area is the geographic extent in which the impacts on cultural resources from the Proposed Project may occur.

3.10.1.2 Cultural Setting

The analysis area has been used by people for thousands of years. The earliest known occupation in Maine occurs roughly 13,000 years before present (BP), or the Paleoindian Period, spanning 13,000 to 11,000 BP. At this time, the climate in the region was sub-arctic with higher elevations and northern Maine being grassy tundra, central Maine having open spruce forest, and southern Maine and New England having a dense spruce conifer forest. The coast would have been miles further off today's coastline and is today marked by a 200-foot depth contour, approximately 33 fathoms underwater (Maine Historic Preservation Commission 2020). Archaeological sites dating to this period reveal that peoples of the time were highly mobile, creating small campsites marked by distinctive stone tools, and hunted caribou and perhaps mammoth and mastodon. It is also possible that Paleoindians had a seasonal costal economy based on shellfish and fish, but there is sparse archaeology to confirm or deny this theory (Maine Historic Preservation Commission 2020). The regional climate warmed rapidly from 10,000 to 3000 BP and marks the Archaic Period. During this time period, Native American groups lived in seasonal villages concentrated at the inlets and outlets of lakes, along major river valleys, and along the coast. Travel between these areas was accomplished via overland routes or by dugout canoes, as evidenced by heavy woodworking stone gouges and chisels used to manufacture the dugouts (Maine Historic Preservation Commission 2020). Fishing as well as terrestrial mammal hunting of deer, moose, bear, and other furbearers were the main food sources of the peoples that lived during the Archaic Period including the peoples of Moorhead Burial tradition and the Susquehanna tradition (Maine Historic Preservation Commission 2020). The Archaic Period transitioned to the Ceramic Period, which took place between 3,000 to 500 BP (1500 AD) and is characterized by technological changes including the manufacture and use of the birchbark canoe, fired clay pottery, and the bow and arrow. Peoples of this time also spoke closely related languages known as the Algonkian language family (Maine Historic Preservation Commission 2020). Birchbark canoes are much lighter than dugout canoes and can be poled and dragged up a beaver-dammed stream or portaged between drainages, which increased the ability to travel long distances. This resulted in increasingly dispersed settlement patterns around lakes and smaller streams during this period. Food was cooked in ceramic pots. Also, evidence of corn, bean, and squash

horticulture is apparent in southern Maine around 900 BP (1100 AD). In this region, growing these foods caused population growth and larger village size. The other areas of the state remained reliant on harvesting and hunting wild resources until after contact with Europeans (Maine Historic Preservation Commission 2020).

Europeans, mainly the French and English in New England, arrived in the Gulf of St. Lawrence around 1500 AD and introduced trade items such as iron tools, copper kettles, glass beads into the pre-existing Native American trade network in the Northeast. European settlement and trade increased after 1600 AD and these items, as well as firearms, became much more common in Maine. Rapid tribal reorganization occurred in southern New England as well as southern and western Maine over the following 150 years as a result of disease introduced by Europeans and warfare among tribes as well as between tribes and European settlers (Maine Historic Preservation Commission 2020). The French and English continued to settle the area and conflicts arose, resulting in the British expelling the French from Maine during the French and Indian War in 1763. This resulted in much of eastern and northern Maine undergoing rapid settlement by English colonists as well as from British Americans in New England. Following the American Revolution, farmers, fishermen, and tradesman migrated to Maine. Although the fishing and agricultural economies dominated, industries such as lumber sawmills, shipbuilding, and paper manufacture became prominent during the late eighteenth century (Rose 2003). Maine achieved statehood in 1820. Between this time and the beginning of the Civil War in 1860, shipbuilding and fisheries continued to lead Maine's economic development. The largest number of nineteenth century immigrants arrived from Canada, mainly of French-Canadian origin, to pursue industry job opportunities in the United States. Irish immigration to the area was also notable during the mid to late nineteenth century. Immigration to Maine slowed after the Civil War and the economic focus of Maine shifted to forest products and textiles (Rose 2003). The tourist industry showcasing Maine's rugged natural landscape blossomed during the twentieth century. The Bath Iron Works Shipbuilding Company, specializing in manufacturing iron and steel ships, was founded in 1884 and became a major factor in Maine's economy and is currently the State's largest private employer (Rose 2003). Maine's current largest industries include tourism, fishing, leather manufacturing, forestry, paper manufacturing, lumber manufacturing, and ship and boat building (Rose 2003).

3.10.1.3 Resources within the Analysis Area

Cultural resources include prehistoric and historical archaeological and architectural structures, features, and objects, as well as Native American traditional cultural and religious properties. Several cultural resources identification and evaluation studies were completed for the Proposed Project in compliance with Section 106 of the NHPA. These studies were conducted in advance of Section 106 consultation to facilitate state permitting under Maine's Site Law, administered by the MDEP. Effects on historic properties are one Site Law consideration. Accordingly, the Maine Historic Preservation Commission (MHPC) provided its findings of effects on historic properties (utilizing the federal Section 106 framework) during the Site Law permitting process. The most up-to-date accounting of cultural resources that could be affected by the Proposed Project, as well as agreed on treatment and avoidance for these resources, is contained in Appendix A of the MOA titled *New England Clean Energy Connect: Treatment and Avoidance Plans for Above Ground and Archaeological Resources* (SEARCH Inc. 2020).

Phase I archaeological surveys conducted along the entirety of the Proposed Project ROW (all 5 segments; only three Segments are evaluated in this EA for the Proposed Project) identified 47 new cultural resources, including 29 sites and 18 isolated finds, and 16 previously recorded sites. Of these, 13 sites in the APE of Segments 1, 2, and 3 are either eligible for the NRHP or their NRHP eligibility status is undetermined and therefore assumed eligible for the purposes of Section 106. No known historic properties are located in the APE Segment 1, four historic properties are located in the APE of Segment 2,

and nine historic properties are located within the APE of Segment 3 (SEARCH Inc. 2020). These 13 historic properties, their NRHP eligibility status, and their associated segment are listed in Table 3.10-1.

Table 3.10-1. Historic Properties in the Area of Potential Effects

Site Number or Name	Site Type	NRHP Eligibility Status	Associated Segment Number
ME 431-035	Fish Hatchery	Undetermined	Segment 2
Appalachian National Scenic Trail	Recreation Trail	Eligible	Segment 2
ME 293-015	Farmstead	Undetermined	Segment 2
ME 293-016	Farmstead	Undetermined	Segment 2
ME 013-002	Domestic	Undetermined	Segment 3
ME 013-003	Domestic	Undetermined	Segment 3
Rural Agricultural Historic District: E. Gray Farm and B.F. Hilton Farm	Rural Agricultural Historic District	Eligible	Segment 3
ME 154-012	Possible Walkway	Undetermined	Segment 3
ME 154-009	Farmstead	Undetermined	Segment 3
ME 217-001	Farmstead	Undetermined	Segment 3
ME 217-003	Farmstead	Undetermined	Segment 3
Turmel Road Bard	Dairy Barn	Eligible	Segment 3
Bowman Airfield	Airfield	Eligible	Segment 3

Source: SEARCH Inc. 2020.
Note: cultural resources with an NRHP eligibility status of Undetermined are assumed eligible for the purposes of Section 106 until which time it becomes necessary to formally evaluate the resource.

3.10.1.4 American Indian Consultation

As described in the USACE Draft Environmental Assessment for the NECEC Transmission Line (USACE 2020a) and the MOA for the Section 106 consultation (USACE et al. 2020, USACE et al. 2021) (Appendix G), although the Proposed Project does not cross any tribal lands, federally recognized tribes that may have an interest in the Proposed Project were consulted. USACE (with DOE as a cooperating agency) invited the Aroostook Band of the Micmacs, the Houlton Band of the Maliseet Indians, the Passamaquoddy Tribe, and the Penobscot Nation to participate in the Section 106 process as consulting parties in accordance with 36 CFR Section 800.3(f)(2). The tribes did not elect to participate in consultation.

3.10.2 Environmental Consequences

3.10.2.1 Impact Analysis Area and Indicators

The impact analysis area for historic and cultural resources is the APE, or a 0.8 km or 0.5-mile buffer on each side of the Proposed Project centerline as well as around converter and substation footprints. Analysis in this section is based off of information provided in the Draft Environmental Assessment for the NECEC Transmission Line and the results of the Section 106 consultation process (USACE et al. 2020; USACE et al. 2020; USACE et al. 2021; SEARCH Inc. 2020). All impacts on cultural resources are permanent as, once disturbed, a cultural resource or traditional cultural property cannot be restored to its original context. The following indicators were considered when analyzing impacts on cultural resources:

- Damage, loss, or disturbance from construction, operation, and maintenance that would alter the characteristic(s) which make a historic property or resource of traditional or cultural significance to American Indian tribes eligible for listing in the NRHP

- Damage, loss, or disturbance from construction, operation, and maintenance that would alter the characteristic(s) which make a place of traditional or cultural significance important to Native American tribes

- Visual impacts on setting, feeling, or association where setting, feeling, or association is a characteristic which make the resource eligible for listing in the NRHP (Criterion A, B, or C[10] only)

3.10.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project; the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Segment 1

There are no known historic properties in Segment 1, therefore no known sites, buildings, structures, or districts listed in or eligible for listing in the NRHP, would be affected by construction activities. Additionally, based on information known to date, no resources important to American Indian tribes have been identified, and activities related to the Proposed Project are not expected to have an adverse impact to known historic properties or resources of cultural or religious significance to Native American tribes.

There is potential for the discovery of unknown cultural resources during construction, operation, and maintenance activities within the APE. Unanticipated discoveries during construction and operations can result in displacement or destruction of the cultural resource. Disturbance of the archaeological deposits can result in the loss of context of the site and limits that ability to extrapolate data regarding settlement and subsistence patterns. However, according to Section V of the MOA (USACE et al. 2020; USACE et al. 2021), if any potential historic properties are discovered, the Consulting Parties would consult in accordance with 36 CFR Section 800.14 and the applicant may be required to conduct additional investigations and implement additional avoidance, protection, or mitigation measures.

Segment 2

One known historic property, the ANST, and three sites of unknown NRHP eligibility (ME 431-035, ME 293-015, and ME 293-016) exist within the Segment 2 APE. The ANST is a multistate hiking trail established in the 1920s and 1930s and 282 miles of the trail exists in Maine. The NPS is the lead federal agency for the administration of the trail under the National Trails System Act (16 U.S.C. 1241 *et seq.*). The Maine segment of the ANST was determined eligible for the NRHP under Criterion A for its landscape design and association with hiking clubs, the conservation movement, and the Civilian Conservation Corps with a period of significance circa 1920–1968 (SEARCH Inc. 2020). The ANST currently crosses the APE three times from which existing transmission line structures are visible for up to 400 feet. However, the density and height of the vegetation to the west of the currently cleared ROW would be reduced under the Proposed Project with the widening of the ROW by 75 feet, cumulatively

[10] NRHP properties eligible under Criterion A are associated with events that have made a significant contribution to the broad patterns of our history. Properties eligible under Criterion B are associated with the lives of significant persons in our past. Properties eligible under Criterion C are properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

causing impacts that would adversely affect the ANST. During Section 106 consultation with consulting parties, it was concluded that the ANST user's experience would be enhanced by modifying the location and number of trail crossings by moving the trail to the pre-1987 route. The modified trail alignment would cross the ROW once along Segment 2 in the vicinity of the trail route circa 1956 and 1962. Additional details and maps of the route realignment as well as additional minimization and mitigation measures are described in the Treatment and Avoidance Plan (SEARCH Inc. 2020), which is Appendix A of the MOA (USACE et al. 2020; USACE et al. 2021). These measures are designed to minimize impacts on the ANST and have been agreed on by Consulting Parties in the MOA (USACE et al. 2020; USACE et al. 2021).

Because the three sites of unknown NRHP eligibility (ME 431-035, ME 293-015, and ME 293-016) are assumed eligible for the NRHP for the purposes of Section 106, they would be subject to avoidance and treatment measures detailed in the Treatment and Avoidance Plan (SEARCH Inc. 2020) that consist of avoidance of undisturbed areas using fencing and monitoring as well as implementing the use of travel lanes in disturbed areas and timber mats where clearing impacts cannot be avoided to prevent subsurface disturbance. These measures would avoid or prevent impacts on these resources and the applicant has committed to the implementation of these measures in the MOA (USACE et al. 2020; USACE et al. 2021).

As with Segment 1, there is potential for the discovery of unknown cultural resources during construction and maintenance activities within the APE and potential impacts on those resources would be the same as those described in that section. However, Section V of the MOA (USACE et al. 2020; USACE et al. 2021), states that the Consulting Parties would act in accordance with 36 CFR Section 800.14 if any potential historic properties are discovered, and the applicant may be required to conduct additional investigations and implement additional avoidance, protection, or mitigation measures.

Segment 3

Segment 3 contains three known historic properties (the Rural Agricultural Historic District, the Turmel Road Barn, and the Bowman Airfield) and six sites of unknown NRHP eligibility (ME 013-002, ME 013-003, ME 154-012, ME 154-009, ME 217-001, and ME 217-003). The Rural Agricultural Historic District is composed of the E. Gray Farm and the B.F Hilton Farm. Both farms are eligible for listing in the NRHP under Criterion A for Agriculture/Farming and Settlement and Criterion C for Architecture. The farms comprise a potential rural agricultural historic district that is locally significant as both farmsteads are intact and retain their historic agricultural landscape setting and function to represent the mid-to-late nineteenth century agricultural development in Somerset County, Maine. The proposed period of significance for the district is 1811 through 1968. There is an existing transmission line that bisects the district as well as a transfer station and access road that exist on the west side of the district. The Proposed Project would be co-located with the existing transmission line but would require improvements to the ROW corridor that include clearing an additional 75 feet to accommodate co-location of the proposed transmission line and the erection of 100-foot tall structures adjacent to existing 45-foot-tall structures (SEARCH Inc. 2020).

The Turmel Road Barn was determined eligible for listing in the NRHP in 2009 under Criterion A for Agriculture/Farming and under Criterion C for Architecture. The dairy barn is a typical example of mid- to late-nineteenth century agricultural construction that contributes to the setting, feeling, and association of mid- to late-nineteenth century New England agricultural development. Although existing transmission lines are present and visible, they are the same height as the surrounding trees and are not visually intrusive. The Proposed Project would introduce a new transmission line with 100-foot tall structures and the height difference would impact the setting, feeling, and association of the barn (SEARCH Inc. 2020).

The Bowman Airfield was determined eligible for listing in the NRHP in 2009 under criterion A for Transportation. The airfield consists of a one-story hanger constructed in the 1960s that was moved from the northern end of the runway following the construction of modern hangers in the 1990s. The airfield is a typical example of a mid-twentieth century rural airstrip and complex that retains its rural setting. Existing transmission lines currently pass immediately west of the airfield. The Proposed Project would introduce a new transmission line with 100-foot-tall structures adjacent to and west of the existing lines. The Proposed Project would require clearing an additional 75 feet to accommodate co-location of the proposed transmission line and would be visible from the airfield and associated buildings, introducing an impact to the property's historic integrity of setting and feeling.

Through discussions with the Consulting Parties, mitigation measures were decided on to reduce the impact to the historic properties along Segment 3 described above. These include reconnaissance-level survey in towns or areas that have not yet been fully surveyed to provide a broader public benefit to the towns and the state by informing preservation plans. Detailed stipulations regarding these surveys are described in the Treatment and Avoidance Plan (SEARCH Inc. 2020), which is Appendix A of the MOA (USACE et al. 2020; USACE et al. 2021).

Because the six sites of unknown NRHP eligibility (ME 013-002, ME 013-003, ME 154-012, ME 154-009, ME 217-001, and ME 217-003) are assumed eligible for the NRHP for the purposes of Section 106, they would be subject to avoidance and treatment measures detailed in the Treatment and Avoidance Plan (SEARCH Inc. 2020). These measures consist of avoidance of undisturbed areas using fencing and monitoring as well as implementing the use of travel lanes in disturbed areas. Hand felling of trees and timber mats where clearing impacts cannot be avoided would be used to prevent subsurface disturbance. These measures would avoid or prevent impacts on these resources and the applicant has committed to the implementation of these measures in the MOA (USACE et al. 2020; USACE et al. 2021).

As with Segment 1, there is potential for the discovery of unknown cultural resources during construction and maintenance activities within the APE and potential impacts on those resources would be the same as those described for that Segment. However, Section V of the MOA (USACE et al. 2020; USACE et al. 2021) states that the Consulting Parties would act in accordance with 36 CFR Section 800.14 if any potential historic properties are discovered, and the applicant may be required to conduct additional investigations and implement additional avoidance, protection, or mitigation measures.

3.10.2.3 Applicant Committed Measures

Through Section 106 consultation between USACE, DOE, DOI, NPS, CMP, and the Maine SHPO, a MOA for the Proposed Project has been developed and agreed upon by all Consulting Parties (USACE et al. 2020; USACE et al. 2021). The MOA provides the detailed and binding measures and stipulations that would be implemented in order to take into account the Proposed Project's adverse effects on historic properties.

3.11 Air Quality and Climate Change

3.11.1 Affected Environment

This section describes air quality and climate conditions in the analysis areas. The analysis area for Air Quality – Local Effects is 1,000 feet from transmission line centerline and from edge of fixed facilities (e.g., substations). The analysis area for Air Quality – Regional Effects is the MDEP Southern, Central, and Eastern Maine Regions. The analysis area for Climate is Global.

Many human activities cause gases and particles to be emitted into the atmosphere. When certain gases and particles accumulate in the air in high enough concentrations, they can harm humans, especially children, the elderly, asthmatics, and other sensitive individuals, and can damage crops, vegetation, buildings, and other property. Air quality is generally influenced by the quantities of pollutants released within and upwind of the area and can be highly dependent on the chemical and physical properties of the pollutants. The topography, weather, and land use in an area also affect how pollutants are transported and dispersed and the resulting ambient concentrations.

3.11.1.1 Clean Air Act and Ambient Air Quality Standards

To reduce air pollution levels, the Federal government and state agencies have passed legislation and established regulatory programs to limit the allowable quantities of pollutants that may be emitted, and the allowable concentrations in ambient (outdoor) air. Under the federal Clean Air Act, the USEPA has established National Ambient Air Quality Standards (NAAQS) for "criteria" pollutants (40 CFR 50). Criteria pollutants are the predominant air pollutants of concern for public health and the environment, and include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter 10 and 2.5 microns in diameter and smaller (PM_{10} and $PM_{2.5}$, respectively), and sulfur dioxide (SO_2). Volatile organic compounds (VOCs) are not defined as a criteria pollutant but along with nitrogen oxides (NO_X) contribute to the formation of ozone; consequently, VOCs and NO_X are considered in criteria pollutant evaluations.

USEPA sets primary and secondary NAAQS. Primary standards are set at levels to protect public health, including the health of sensitive populations (e.g., asthmatics, children, the elderly), with a margin of safety. Secondary standards are set to protect public welfare, including protection against decreased visibility, increased deposition, and damage to animals, crops, vegetation, and buildings. Some pollutants, such as particles emitted by wildfires, can affect air quality by contributing to regional haze and reduced visibility. SO_2 and NO_X can contribute to acidic deposition. The Clean Air Act lists other pollutants known as Hazardous Air Pollutants (HAPs). However, USEPA and MDEP have not set NAAQS for HAPs, visibility, or acidic deposition. Table 3.11-1 summarizes the NAAQS. MDEP has adopted the NAAQS as the state standards.

Table 3.11-1. National Ambient Air Quality Standards

Criteria Pollutant	Averaging Period	Primary Standard	Secondary Standard
Carbon monoxide (CO)	8-hour[a]	9 ppm (10 mg/m^3)	None
	1-hour[a]	35 ppm (40 mg/m^3)	None
Lead (Pb)	Rolling 3-month average	0.15 µg/m^3	Same as primary
Nitrogen dioxide (NO_2)	Annual (arithmetic mean)	0.053 ppm (100 µg/m^3)	Same as primary
	1-hour[b]	0.100 ppm (188 µg/m^3)	None
Particulate matter (PM_{10})	24-hour[c]	150 µg/m^3	Same as primary
Particulate matter ($PM_{2.5}$)	Annual (arithmetic mean)[d]	12.0 µg/m^3	15.0 µg/m^3
	24-hour[e]	35 µg/m^3	Same as primary
Ozone (O_3)	8-hour[f]	0.070 ppm	Same as primary
Sulfur dioxide (SO_2)	3-hour[a]	None	0.5 ppm (1,300 µg/m^3)
	1-hour[h]	0.075 ppm (196 µg/m^3)	Same as primary

Source: 40 CFR 50.

mg/m^3 = milligrams per cubic meter, $\mu g/m^3$ = micrograms per cubic meter, ppb = parts per billion, ppm = parts per million
[a] Not to be exceeded more than once per year.
[b] To attain this standard, the 98th percentile of 1-hour daily maximum NO_2 concentrations, averaged over 3 years, must not exceed 0.100 ppm (100 ppb).
[c] Not to be exceeded more than once per year on average over 3 years.
[d] To attain this standard, the 3-year average at any monitor must not exceed 12.0 $\mu g/m^3$ (primary standard) or 15.0 $\mu g/m^3$ (secondary standard).
[e] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$.
[f] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average O_3 concentrations measured at each monitor within an area over each year must not exceed 0.070 ppm.
[h] To attain this standard, the 99th percentile of 1-hour daily maximum SO_2 concentrations, averaged over 3 years, must not exceed 0.075 ppm (75 ppb).

3.11.1.2 Attainment Status and Existing Conditions

When the measured concentrations of a criteria pollutant in a geographic region are less than those allowed by NAAQS, USEPA designates the region as an "attainment area" for that pollutant; if the concentration of a criteria pollutant exceeds the NAAQS, USEPA designates the region as a "nonattainment area;" if a region that formerly was designated nonattainment has achieved attainment, USEPA designates the region as a "maintenance area." The entire State of Maine is designated as attainment for all criteria pollutants (MDEP 2019).

States have the responsibility for bringing their regions into compliance with NAAQS. State Implementation Plans are USEPA-approved plans that set forth the pollution control requirements applicable to the various sources addressed by each State. Section 176(c) of the Clean Air Act prohibits federal entities from taking actions in nonattainment or maintenance areas that do not "conform" to the State Implementation Plan. The purpose of this conformity requirement is to ensure that federal activities: (1) do not interfere with the emissions budgets in the State Implementation Plans; (2) do not cause or contribute to new violations of the NAAQS; and (3) do not impede the ability to attain or maintain the NAAQS. To implement Clean Air Act Section 176(c), the U.S. Environmental Protection Agency issued the General Conformity Rule (40 CFR Part 93, Subpart B), which applies only in nonattainment and maintenance areas. Therefore, the General Conformity Rule does not apply to the Proposed Project.

Because the Proposed Project region is in an attainment area, criteria pollutant concentrations are expected to be less than the NAAQS. The Proposed Project region is mostly rural, with few areas of dense development, major highways, or large industrial sources of emissions. Based on these conditions, existing concentrations of pollutants are expected to be relatively low.

3.11.1.3 Climate of Maine

Maine's northerly latitude and geographic location on the eastern margin of the North American continent exposes the state to the moderating and moistening influence of the Atlantic Ocean, as well as the effects of the hot and cold air masses from the interior of the continent. Maine also is located within the primary storm track of the mid-latitudes. Maine's climate is characterized by cold, snowy winters and mild summers. Mean annual winter temperatures range from 25 degrees Fahrenheit (°F) in the far south to less than 15°F in the northern and interior portions of the state. Mean annual summer temperatures range from near 60°F in the far north to near 70°F in the south (NOAA 2016).

3.11.1.4 Climate Change

Climate change, both locally and globally, describes the gradual increase or decrease in average temperatures, or changes in the frequency or intensity of precipitation, wind, or other climate variables. Multiple influences, both natural and anthropogenic, contribute to climate change.

The Greenhouse Effect

The Earth absorbs heat energy from the sun and returns most of this heat to space. Greenhouse gasses (GHGs) trap heat in the lower atmosphere (the atmosphere extending from Earth's surface to approximately 4 to 12 miles above the surface) by absorbing the heat energy emitted by Earth's surface and lower atmosphere and reradiating much of it back to the Earth's surface, causing warming (commonly known as the greenhouse effect). Global atmospheric concentrations of GHGs have increased since the beginning of the industrial revolution, changing the energy balance of the Earth and causing it to warm, which in turn affects climatic conditions. Global climate change refers to long-term (multi-decadal) trends in global average surface temperature, precipitation patterns, ice cover, sea levels, cloud cover, sea-surface temperatures and currents, and other climate conditions (USEPA 2017a). USEPA has defined several gaseous compounds or groups of compounds as GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and various fluoride gases, including sulfur hexafluoride (SF_6). The global warming potentials (GWP)[11] for these gases as listed in USEPA rules (40 CFR 98, Subpart A, Table A-1) for a 100-year time horizon are: carbon dioxide – 1, methane – 25, nitrous oxide – 298, and sulfur hexafluoride – 22,800.

Climate Change in Maine

Temperatures have risen about 3°F in Maine since the beginning of the twentieth century. Winter temperatures have been increasing about twice as fast as summer temperatures. Temperatures are generally projected to exceed historical record levels by the middle of the twenty-first century. The intensity of cold waves is projected to decrease, whereas the intensity of heat waves may increase. Winter warming has resulted in earlier ice-out dates on lakes. On Damariscotta Lake (Lincoln County), the average ice-out date has changed from mid to late April in the early and middle part of the twentieth century to early April now. The growing season has lengthened (NOAA 2016).

Precipitation has increased during the last century. Increases in the frequency and intensity of extreme precipitation events also have occurred and are projected to continue. Mean annual precipitation in Maine has exhibited historically high values in recent years Annual mean precipitation is projected to increase, most likely in the winter and spring. The number of extreme precipitation events (number of days with more than 2 inches) has been variable but recent years have seen a record number of such events, similar to the rest of the northeastern United States. The estimated magnitude of the 24-hr, 100-year rainstorm has increased since 1961, in some areas by more than 20 percent. Sea level at Portland has risen by about 8 inches since 1912, and is projected to rise another 1 to 4 feet by 2100 (NOAA 2016).

3.11.2 Environmental Consequences

This section discusses the impacts of the Proposed Project on air quality and climate.

[11] Each GHG has a different level of radiative forcing (the ability to trap heat). To compare their relative global warming impact, gases are converted to carbon dioxide equivalent (CO_2e) using their unique global warming potential (GWP), which is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide. The larger the GWP, the more that a gas contributes to global warming compared to carbon dioxide over a 100-year period. Carbon dioxide has a GWP of 1, because it is the gas being used as a reference (USEPA 2017b).

3.11.2.1 Impact Analysis Area and Indicators

The analysis area for local effects on air quality is 1,000 feet from transmission line centerline and from edge of fixed facilities (e.g., substations). The analysis area for regional effects on air quality is the MDEP Southern, Central, and Eastern Maine Regions.

The indicator for determining whether or not the Proposed Project would result in a significant impact on air quality is an increase in ambient pollutant concentrations, as a result of project emissions, that would result in an exceedance of the NAAQS.

The analysis area for impacts on climate is the global atmosphere. USEPA and other agencies have not established thresholds of significance for GHG emissions and climate change. Any increase in GHG emissions would contribute incrementally to climate change, but the climate impacts of a single project are too small to be measurable. Potential climate impacts are evaluated in terms of the magnitude of change in GHG emissions.

3.11.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project. The transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur. Changes to the climate that are currently occurring would continue.

Proposed Project

Common Impacts Across all Segments

This section discusses air quality and climate change impacts that are common to all of the Proposed Project segments.

Air Quality

Implementation of the Proposed Project could affect air quality during construction and operation and maintenance. Construction would involve a variety of trucks and equipment typical of land clearing, logging, access road construction, erecting poles and line, and foundations and structural work at fixed facilities. Examples of specific equipment types include dozers/backhoes/tractors, excavators, cranes/boom trucks, pickup trucks, flatbeds and other heavy trucks, and more specialized equipment related to installing poles and lines and other tasks. Helicopters may be used to string the line. There could be one to eight pieces of each equipment type active at once, depending on the nature of the work and the number of active work sites. All of this equipment would produce engine exhaust emissions. Fugitive[12] dust emissions would originate from ground-disturbing activities and earthwork, and from operation of construction equipment and trucks on unpaved roads and earth surfaces.

Construction activities would be temporary and would be dispersed at multiple work sites along the transmission corridor. Construction air quality effects would be mostly localized to the vicinity of the work sites. Because construction emissions would be temporary and would be dispersed along the length

[12] Fugitive emissions are emissions that are not emitted from a stack, vent, or other specific point that controls the discharge. For example, windblown dust is fugitive particulate matter.

of the ROW and over the 35-month construction duration, construction activities are not expected to lead to pollutant concentrations that could exceed the NAAQS. Applicant Committed Measures (Section 3.11.2.3, *Applicant Proposed Measures*) would reduce construction emissions of fugitive dust.

Operation and maintenance activities would involve vehicular travel and equipment usage along the proposed transmission line and at substations but the total amount of activity and the resulting emissions would be low. Helicopters would be used for twice-yearly visual inspection of the corridor. The applicant may install diesel-fueled electric generators at substations to provide backup power in the event of loss of primary power. These generators would be subject to MDEP permitting requirements that minimize emissions and potential offsite impacts. Because operational activities involve relatively low intensity of equipment and vehicle use and would be dispersed along the length of the ROW, operation and maintenance activities are not expected to lead to pollutant concentrations that could exceed the NAAQS.

Emissions of criteria pollutants from fossil-fueled power plants can affect regional air quality. To the extent that the energy transmitted by the Proposed Project would displace energy that would otherwise be generated by fossil-fueled power plants, net reductions in regional emissions could occur. These reductions could lead to a beneficial air quality impact in New England and the Northeast, depending on the locations of the affected power plants.

Climate Change

GHG emissions have been shown to contribute to climate change, as discussed in Section 3.11.1.4, *Climate Change*. As with air quality, discussed above, implementation of any of the Proposed Project would entail emissions of GHGs from equipment and vehicle exhaust during construction and operation and maintenance. During construction, the clearing of the ROW would require clearing of natural vegetation, releasing some CO_2 into the atmosphere.

During operation, direct GHG emissions would occur from any sulfur hexafluoride (SF_6) lost from circuit breakers and switches that would be used at the substations. The total amount of SF_6 contained in the circuit breakers and switches at the proposed substations associated with the Proposed Project would be approximately 6,500 pounds. Based on the applicant-quoted average leakage rate of slightly less than 0.5 percent per year, a maximum of approximately 33 pounds per year of SF_6 would potentially leak. Multiplying by the GWP of 22,800 for SF_6, the estimated total annual CO_2-equivalent (CO_2e) emissions from SF_6 leakage would be about 376 tons (341 metric tons) per year.

As with air quality, discussed above, operation of the Proposed Project would reduce emissions of GHGs in New England to the extent that the hydropower generated by Hydro-Québec and supplied via the Proposed Project would displace electricity generated by combustion of fossil fuels. To assess the changes in GHG emissions associated with the Proposed Project, the results of two studies were evaluated: one prepared for CMP by Daymark Energy Advisors (Daymark 2017) and one prepared for MPUC by London Economics International (LEI 2018). DOE determined that the estimates of GHG emission reductions appeared to be reasonable and plausible and that the two studies provided the best information available on the potential changes in GHG emissions associated with the Proposed Project.

The Daymark study estimated that the Proposed Project would reduce GHG emissions by approximately 3.1 million metric tons CO_2e per year, whereas the LEI study estimated that the Proposed Project would reduce GHG emissions by approximately 3.6 million metric tons CO_2e per year. Both studies estimated the changes in emissions for New England. If Hydro-Québec were to supply electricity via the Proposed Project by diverting that energy from markets outside New England, then those markets would need to obtain energy from other sources. Since Hydro-Québec is predicted to have excess hydropower generating capacity, and so could maximize its revenue by supplying electricity via the Proposed Project

without diverting the electricity from other markets, it is unlikely that GHG emissions produced by combustion of fossil fuels would increase.

3.11.2.3 Applicant Committed Measures

Best management construction practices would be employed to minimize emissions of fugitive dust, including:

- Use of water or other wetting agents on areas of exposed and dry soils before or during windy conditions
- Use of covered trucks for transport of soils or other dry materials
- Controlled storage of spoils on the construction site which may include mulching storage piles with hay or covering with tarps in concert with containing the piles with erosion control mix and/or silt fencing
- Final grading, landscaping, and revegetation or permanent stabilization with approved materials as soon as practical

3.12 Noise

Noise is defined as unwanted sound. The acoustical energy produced by a source propagates through the air as fluctuations in air pressure. These pressure fluctuations, also called sound pressure, are what human ears hear and microphones measure.

Sound energy is physically characterized by amplitude and frequency. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. A 3 dB change in a continuous broadband sound level is generally considered “just barely perceptible” to the average listener. A 6 dB change is generally considered “clearly noticeable,” and a 10 dB change is generally considered a doubling (or halving, if the sound decreases) of the apparent loudness.

Sound waves fluctuate at specific frequencies, depending on the nature and characteristics of the source. Frequency is measured in Hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in low and high frequencies. For measuring noise, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in dBA. For reference, the sound pressure level and subjective loudness associated with some common sound sources are listed in Table 3.12-1.

Table 3.12-1. Typical Sound Pressure Levels Associated with Common Sound Sources

Sound Pressure Level (dBA)	Subjective Description	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 ft	--
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	--
120	Threshold of feeling	Elevated train	Hard rock band
110	--	Jet aircraft flyover at 1,000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd noise at football game	--
90	--	Propeller aircraft flyover at 1,000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal
70	Loud	B-757 aircraft cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet	--	Private office
40	--	Farm field with light breeze, birdcalls	Soft music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and music)
20	--	Rustling leaves	Quiet theater, whisper
10	Just audible	--	Human breathing
0	Threshold of hearing	--	--

Sources: Adapted from Egan 1988 and Ramsey and Sleeper 1994.

Although an instantaneous sound level measured in dBA may indicate the level of noise experienced by an observer at that point in time, environmental sound levels vary continuously. Sound in the environment is constantly fluctuating, for example, when a car drives by, a dog barks, or a plane passes overhead. Most ambient environmental sounds include a mixture of identifiable sources and a relatively steady background sound where no particular source is identifiable. To describe the time-varying character of environmental noise, statistical noise descriptors are used. The equivalent sound level (L_{eq}) is used to describe the average sound level for a specific time period. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the average acoustic energy contained in the fluctuating sound level measured during a specified time period. The exceedance sound level descriptor, Lx, is the sound level exceeded "x" percent of the sampling period and is referred to as a statistical sound level. L90 is the sound level equaled or exceeded during 90 percent of a given time interval and is often used to represent background sound levels without the influence of extraneous sounds.

3.12.1 Noise Laws, Ordinances, Regulations, and Standards

The regulation of noise falls within the jurisdiction of MDEP and various municipalities along the Proposed Project. The MDEP noise rule (the Site Location of Development Act (SLODA) Chapter 375.10, Control of Noise) includes a noise standard for proposed developments in municipalities without a local, quantifiable noise standard, or with a standard that is not sufficiently rigorous, and in unorganized and de-organized areas of Maine. The most conservative (lowest) decibel limits under SLODA (2020)

include 55 dBA during the daytime (7 a.m.–7 p.m.) and 45 dBA during the night (7 p.m.–7 a.m.) at the property line of any protected location, such as a residential property. The MDEP requires that a 5 dBA penalty be added to the measured total dBA when pure tones are observed. The MDEP also regulates sound during construction. Nighttime construction noise levels cannot exceed the standard nighttime noise limit, and daytime construction noise is subject to a sliding-scale limit based on the duration of the construction activities.

Some local Maine jurisdictions that the Proposed Project would traverse have their own noise regulations. These localities are Lewiston, Auburn, Greene, Leeds, New Sharon, and Durham. The specific sound pressure level limits in each of the localities are summarized in Table 3.12-2.

Table 3.12-2. Municipal Sound Pressure Level Limits (Municipal Ordinances)

	Sound Pressure Level Limit (dBA) Daytime / Nighttime			
Locality	Residential	Business/ Commercial	Industrial	Source of Limit
Lewiston	50	60	70	City of Lewiston Code of Ordinances Appendix A Section 19
Greene	55/45[b]	65/55[b]	70/60[b]	Town of Greene Code of Ordinances Section 6-501.1
Leeds	55/45[b]	65/55[b]	70/60[b]	Town of Leeds Code of Ordinances Section 5.F.14
New Sharon	55/45[a,c]	65/55[a]	70/60[a]	Town of New Sharon Site Plan Review Ordinance Section IV

[a] Daytime is 7 a.m. to 7 p.m. and nighttime is 7 p.m. to 7 a.m.
[b] Daytime is 7 a.m. to 10 p.m. and nighttime is 10 p.m. to 7 a.m.
[c] New Sharon also has institutional limits identical to the residential limits.

3.12.2 Affected Environment

3.12.2.1 Existing Noise Conditions

The analysis area for noise is 0.5-mile from the proposed transmission line centerline and from the edge of substations/fixed facilities. Land use throughout the analysis area includes rural, forested, and undeveloped areas, with some scattered residences and other areas of localized development. Existing noise in the analysis area consists of natural sounds such as animals, insects, wind, and rustling vegetation. In areas where development or infrastructure exists, there are sounds common to substations, roadways, and other human-caused activities. There would be minimal noise associated with the existing power lines in Segment 2 and Segment 3 that the proposed transmission line expansion would parallel. To establish existing ambient noise levels, the applicant measured noise along the proposed transmission line route and near the existing Larrabee Road Substation from June 27 to 29, 2017 (NECEC 2017). Long-term continuous monitors and short-term measurements were used to established ambient sound levels along the proposed route. Because the primary land uses within most of the analysis area are forested or agricultural with minimal rural residential populations, the average noise levels in these areas range from 20 to 40 dBA during the day and night. In more developed areas, ambient noise levels range from 30 to 50 dBA during the day and night, with some measured ambient levels exceeding the MDEP regulatory limit (See Table 3.12-3).

The applicant used four long-term noise meters to continuously record noise data throughout the 3-day study (NECEC 2017). Figure 3.12-1 shows the noise measurement locations. These noise meters were unmanned for the majority of the time. All measurements were taken using an American National Standards Institute (ANSI) S1.4 type 1 sound-level meters (Larson-Davis Model 831). The sound level meters were field calibrated before and after each set of measurements. None of the calibration level changes exceeded ± 0.5 dB, which is within the acceptable variance per ANSI guidance. A windscreen was used at all times on the microphones to avoid the influence of wind-induced sound increases. Meters

were located in the undeveloped portion of the corridor, within the existing corridor adjacent to the Appalachian Trail crossing and further south in the existing corridor in areas with scattered nearby residences. The meters were installed at an elevation of approximately 5 feet above the ground surface.

These meters recorded overall sound, octave bands, and various other sound metrics each second of the measurement period. Measured sound levels fluctuated due to background sound sources. The one-second average sound levels showed constant fluctuations in sound. The average ambient sound levels for daytime and nighttime periods for each of the continuous sound level meters are provided below in Table 3.12-3.

Table 3.12-3. Measured Average Ambient Daytime and Nighttime Sound Levels

Monitor Location (See Fig. 3.12-1[b])	Daytime[a] Sound Level		Nighttime[a] Sound Level	
	L_{eq} (dBA)	L90 (dBA)	L_{eq} (dBA)	L90 (dBA)
Meter 1	34.2	34.1	35.8	35.6
Meter 2 (location A)	37.5	37.4	28.8	28.8
Meter 2 (location B)	33.0	33.0	26.3	26.4
Meter 3	38.4	38.2	28.9	28.8
Meter 4	47.0	46.8	39.0	38.8

Source: NECEC 2017

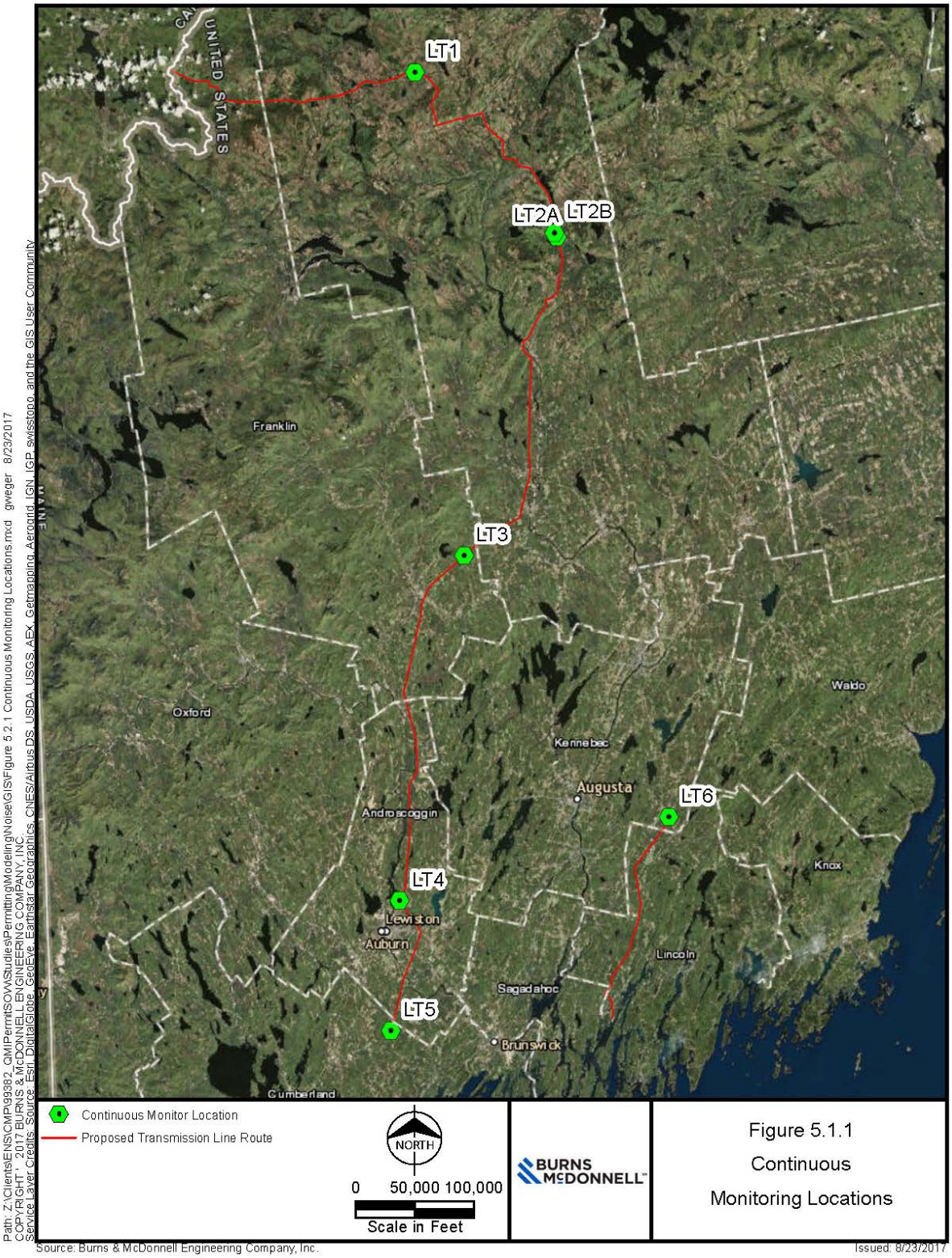
[a] Daytime is 7:00 a.m. to 7:00 p.m. Nighttime is 7:00 p.m. to 7:00 a.m.

[b] Figure 3.12-1 also includes locations LT5 and LT6 which are not relevant to the Proposed Project.

3.12.3 Environmental Consequences

3.12.3.1 Impact Analysis Area and Indicators

The analysis area for impacts on noise is the area within 0.5 mile of the centerline of the proposed transmission line centerline and from the edge of substations/fixed facilities. The indicator for determining whether or not the project would result in a significant impact on noise is a disturbance of noise-sensitive locations (known as *receptors*). Receptors include any residential areas, educational and day-care facilities, health care facilities, long-term-care facilities, places of worship, libraries, parks, and recreational areas specifically known for their solitude and tranquility. Along much of the corridor there are no receptors in the analysis area. In the more developed areas residences are located at various distances from the Proposed Project ROW and substations. Where quantitative noise data are available, predicted noise levels that exceed an applicable noise limit would be considered significant.



Source: NECEC 2017.

Figure 3.12-1. Continuous Noise Monitoring Locations

3.12.3.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project. The transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Common Impacts Across all Segments

Potential Impacts

The Proposed Project would create noise during construction and, to a lesser extent, during operation of the transmission lines, substations, and converter station. This section describes these potential impacts.

Construction

Noise associated with construction activities would be temporary and would occur for various durations and in various locations. Section 3.11, *Air Quality and Climate Change*, above, discusses the types of activities and equipment that would be used. Most construction would occur during normal working hours. Because the Proposed Project involves work on an existing power system that serves customers, there may also be times during which work must occur outside of normal working hours. In addition, there are certain operations that, due to their nature or scope, must be accomplished in part outside of normal working hours. Such work generally consists of activities that must occur continuously, once begun (e.g., filling a transformer with oil).

The impacts that various construction-related activities might have would vary considerably based on the type of activity and the proximity of the various project components and corridor to adjacent property lines. Generic sound data ranges are available for various types of equipment at certain distances. Table 3.12-4 lists generic construction activities and the associated sound levels at a distance of 50 feet. The types of equipment listed in Table 3.12-4 would be used at various times and for varying amounts of time. Most activities would not occur at the same time. For example, there would be periods during which concrete needs to cure and no construction may occur. Typical maximum sound levels during any of these activities would be between 85 and 95 dBA at 50 feet and would be intermittent or would only last for a short duration. Fifty feet is a reference distance and there are very few sensitive receptors this close to the Proposed Project ROW and substations. Sound levels would be lower at distances greater than 50 feet from the Proposed Project corridor or property lines.

Table 3.12-4. Range of Typical Construction Equipment Noise Levels (dBA)

Generic Construction Equipment Type	Minimum Noise at 50 feet	Maximum Noise at 50 feet
Backhoes	74	92
Compressors	73	86
Concrete Mixers	76	88
Cranes (movable)	70	94
Dozers	65	95
Front Loaders	77	96
Generators	71	83
Graders	72	91
Jack Hammers and Rock Drills	80	98

Generic Construction Equipment Type	Minimum Noise at 50 feet	Maximum Noise at 50 feet
Pumps	69	71
Scrapers	76	95
Trucks	83	96

Source: FHWA 2006.

Operation

Operational noise of a transmission system comes from the transmission lines and associated equipment, and from maintenance activities, but primarily from the system's substations that contain transformers. Sound from transmission lines is generally corona discharge. Substations also contain various pieces of equipment that could generate corona noise. Vehicles used for operation and maintenance travelling along the access roads, as well as helicopters used for twice-yearly visual inspection of the corridor, would contribute some noise, but these noise impacts would occur at infrequent intervals, would be short-term in duration, and are not anticipated to exceed applicable noise limits.

Corona noise usually results from the action of the electric field at the surface of the line conductor and is sometimes audible as a characteristic crackling, frying, or hissing sound or hum, especially in wet or humid weather. Because the noise level depends on the strength of the line's electric field, the potential for perception around an overhead line can be assessed from estimates of the field strengths expected during operation. The typical sound level of a 500-kV transmission line at the source is approximately 49 dBA (during wet or humid conditions), just below that of moderate rainfall on foliage (50 dBA) and above that of a household refrigerator (40 dBA) (DOE 1986, 1996). Overhead lines of 345-kV or greater are more likely to produce audible corona noise than those of lower voltages. The conditions that have the potential to cause audible corona noise are expected to occur occasionally, given the precipitation climate of the Proposed Project corridor. Corona noise would be minimized by selecting properly sized conductors. The applicant selected conductor sizes that, under dry conditions, are designed to be nearly noise free. All sound levels produced by new and upgraded transmission lines were modeled and are anticipated to remain within the levels allowed by MDEP.

Substations contain transformers that generate noise. According to Institute of Electrical and Electronic Engineers (IEEE) Standard C57.12.90 and C57.136, the principal sources of sound in transformers are the core sound, load current sound, and sound from cooling equipment. The core sound is caused by magnetostriction effects and inter-laminar magnetic forces. It is influenced by the flux density, core material, core geometry, and excitation voltage waveform. The load sound is caused by electromagnetic forces resulting from leakage fields. It is proportional to the load current and is predominantly produced by the axial and radial vibrations of the windings. The sound from cooling equipment is generally caused by the cooling fans. The fan noise is influenced by the blade-tip speed, blade design, and the number of fans. Pump noise is typically negligible when fans are running.

Operational noise from the proposed new Merrill Road Converter Station and the existing Larrabee Road substation would be generated by the equipment. The Merrill Road Converter Station would consist of converter transformers, valves, reactors, capacitors, and switches. The station will convert DC power to AC power. The Merrill Road Converter Station would be designed and sited to achieve the MDEP and local noise limits for protected locations.

Operational noise at the proposed Merrill Road Converter Station was modeled using the industry-accepted sound modeling software Computer Aided Design for Noise Abatement (CadnaA). The modeled converter station sound levels at nearby protected locations are provided in Table 3.12-5. The table shows that sound levels from the proposed new Merrill Road Converter Station would not exceed the applicable noise level standards at any of the adjacent residential property lines.

Table 3.12-5. Modeled Operational Sound Levels at Proposed Merrill Road Converter Station

Modeled Receptor	Modeled Sound Level (dBA)	Sound Level Limit[a] (dBA)
PL1 – Western edge of ROW opposite nearest residences on Main Street (north)	41.9	50
PL2 – Western edge of ROW opposite nearest residences on Main Street (center)	40.4	50
PL3 – Western edge of ROW opposite nearest residences on Main Street (south)	37.1	50
PL4 – Southern property line near residences on Merrill Road	33.0	50
PL5 – Eastern property line near residences off Sleeper Road	48.3	50
PL6 – Northern property line near residences off Sleeper Road	40.9	50

Source: NECEC 2017
[a] City of Lewiston noise ordinance limits sound to 50 dBA during the day and night at residential property lines.

The applicant proposes to expand the terminal at the existing Larrabee Road Substation in Lewiston, Maine. The terminal expansion would require the addition of a 345-kV line termination structure, a 345-kV circuit breaker, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundations, and modifications to the existing protection and control systems. The applicant also would replace the existing three-phase T1 transformer at the Larrabee Road Substation with a set of three, single-phase autotransformers to mitigate thermal overloads under contingency conditions.

Operational noise at the existing Larrabee Road Substation was modeled using the industry-accepted sound modeling software CadnaA. The modeled converter station sound levels at nearby protected locations are provided in Table 3.12-6. The table shows that sound levels from the Larrabee Road Substation would not exceed the applicable noise level standards at any of the adjacent residential property lines.

Table 3.12-6. Modeled Operational Sound Levels at Larrabee Road Substation

Modeled Receptor	Modeled Sound Level (dBA)	Sound Level Limit[a] (dBA)
PL1 – Western property line near residences off Larrabee Road	38.1	50
PL2 – Western property line near residences off Larrabee Road	40.2	50
PL3 – Western property line near residences off Larrabee Road	41.5	50
PL4 – Southwestern property line near residences along Main Street	43.1	50
PL5 – Southeastern property Line along railroad	42.8	50
PL6 – Eastern property Line along railroad	39.4	50
PL7 – North of northern property line, near residences on Merrill Road	30.9	50

Source: NECEC 2017
[a] City of Lewiston noise ordinance limits sound to 50 dBA during the day and night at residential property lines.

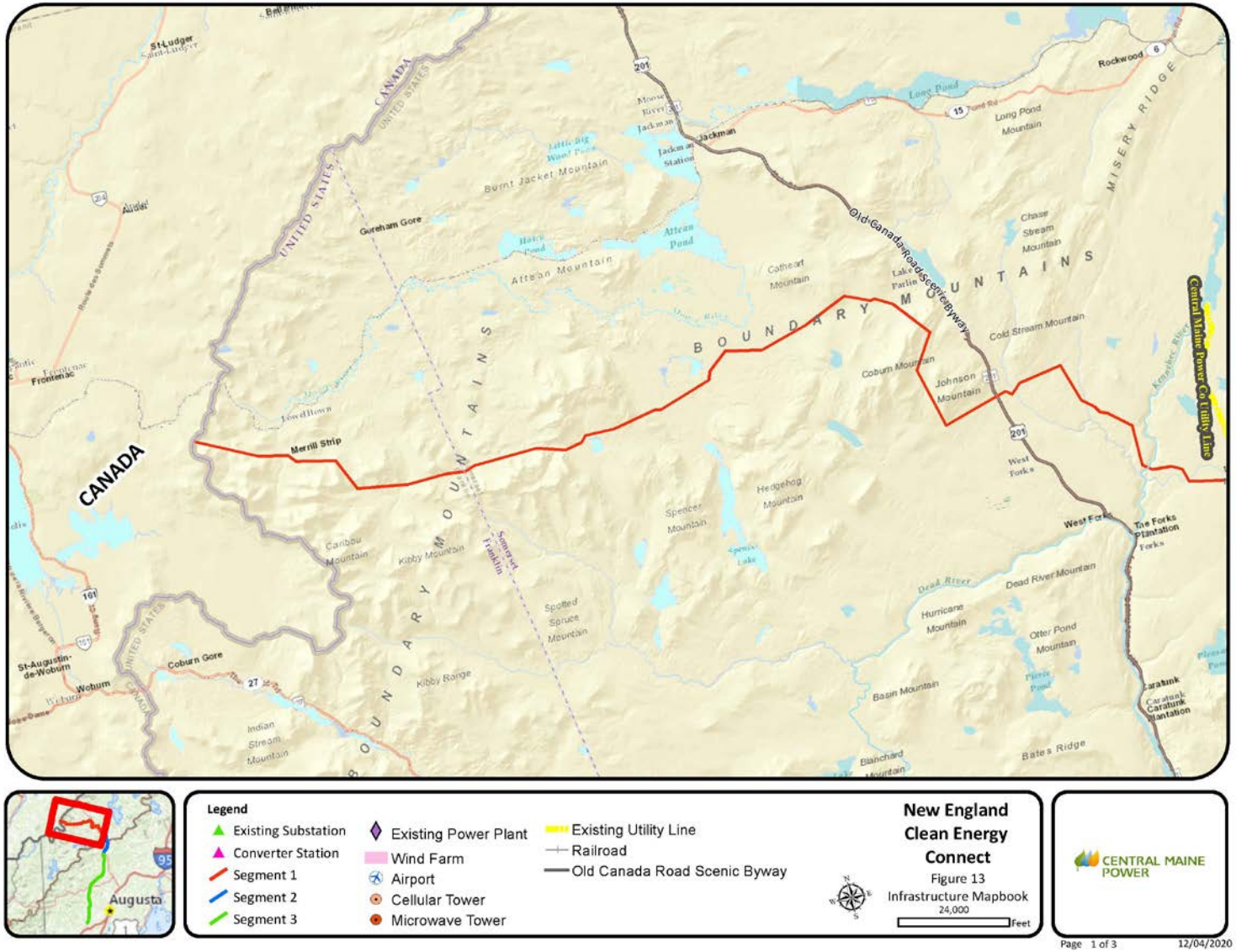
3.12.3.3 Applicant Committed Measures

Best management practices and specific construction methods that reduce construction noise would be implemented, where appropriate.

3.13 Infrastructure

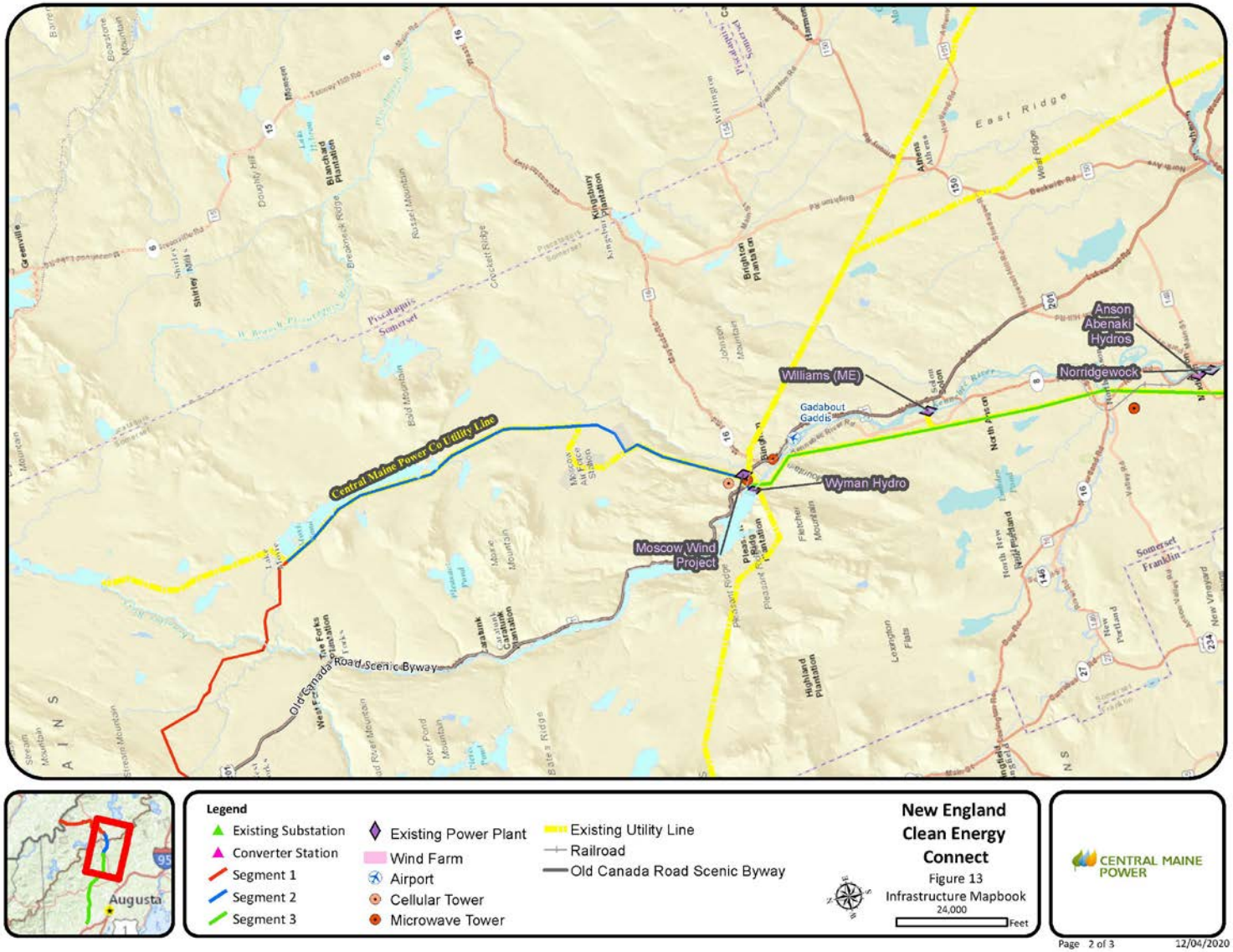
3.13.1 Affected Environment

The analysis area for infrastructure is a 1-mile buffer of the centerline of the transmission line and from the edges of the existing and proposed substations. Infrastructure is defined as those human-made facilities and systems that are fundamental for serving the needs of a population in a specified area. The specific infrastructure components considered in this EA include transportation and traffic; electric power, natural gas, and water supply systems; solid and stormwater management; communications systems; and emergency management. Infrastructure with the analysis area of Segments 1, 2, 3 and the substations is shown in Figure 3.13-1, Figure 3.13-2, and Figure 3.13-3.



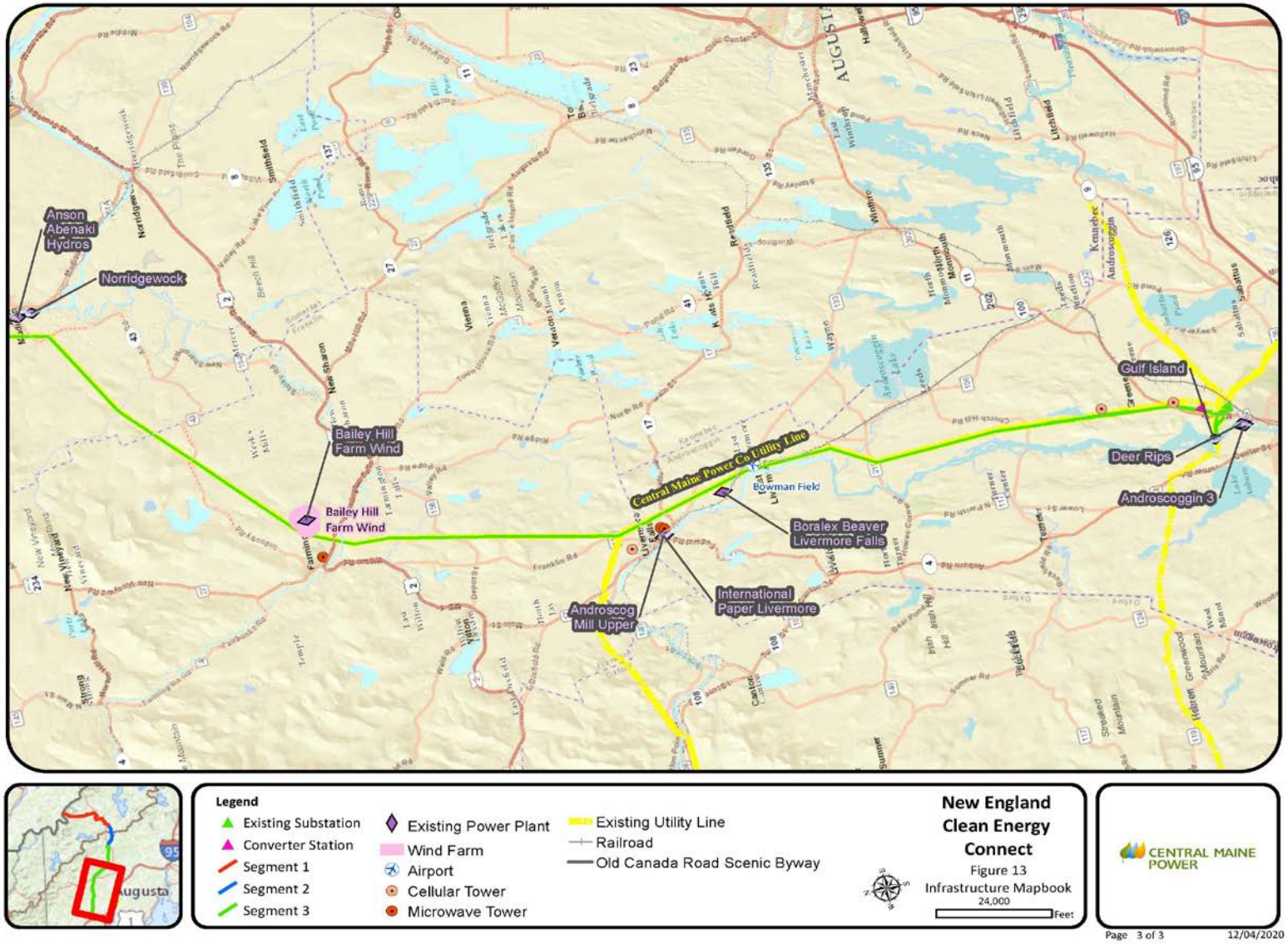
Source: CMP, December 2020.

Figure 3.13-1. Infrastructure in the Analysis Area (Page 1)



Source: CMP, December 2020.

Figure 3.13-2. Infrastructure in the Analysis Area (Page 2)



Source: CMP, December 2020.

Figure 3.13-3. Infrastructure in the Analysis Area (Page 3)

3.13.2 Environmental Consequences

3.13.2.1 Impact Analysis Area and Indicators

The analysis area for infrastructure impacts considers a 1-mile buffer from the centerline of the transmission line and from the edges of the existing and proposed substations. The following indicators were considered when analyzing impacts on infrastructure:

- **Transportation and Traffic**
    - Qualitative discussion of any potential increase in the volume of traffic on access roads and major roadways
    - The number of railroads that are within the analysis area for the Proposed Project
    - The number of existing and planned airports that are within the analysis areas for the Proposed Project
- **Utilities**: disruption of service for municipal utilities, utility corridors, and/or radio, television, or cellular communications
- **Stormwater Management**: destruction of stormwater management infrastructure
- **Emergency Services**: disruption of service for hospitals, fire stations, or police stations

3.13.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project; the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Transportation and Traffic

Construction of the Proposed Project would involve construction of temporary access roads for project construction. Temporary, unpaved access roads through sections of the proposed new transmission line corridor would need to be established for the clearing and construction phases of the Proposed Project. Temporary access roads would be restored to pre-existing contours and revegetated once construction is complete and final restoration has been established. No new permanent roadways would be developed for the Proposed Project. Therefore, construction of the Proposed Project would not create new transportation routes or new traffic patterns, with the exception of new road access to the proposed new Merrill Road Converter Station.

Roads and other infrastructure in the analysis area are illustrated in Figure 3.12-1, Figure 3,12-2, and Figure 3.12-3. Access to the ROW and substations for operation and maintenance would be by way of existing public and private roads. There are no public roads within Segment 1 between the Canadian

Border and State Route 201; access to this portion of the transmission corridor would be by way of private roads. Proposed Project construction and maintenance related parking would primarily be in upland locations on the Proposed Project corridor or in existing developed areas. No on-street parking would be associated with the Proposed Project.

For issuance of the State Land Use Permit (SLC9) the Maine Land Use Commission evaluated areas of the Proposed Project within its jurisdiction to ensure that adequate provision has been made for loading, parking and circulation of land; traffic movement in, on, and from the Proposed Project site. The Maine Land Use Commission reviewed the Proposed Project for assurance that the proposal would not cause congestion or unsafe conditions with respect to existing or proposed transportation arteries or methods. The Commission concluded that the Proposed Project would adequately provide for loading, parking and circulation of traffic, in, on and from the site, and concluded that the proposal would not cause congestion or unsafe conditions, provided the applicant complies with all applicable regulations of Maine DOT, Franklin County, and Somerset County in accordance with Condition #4 of the Site Law Certification.

Airports and Railroads

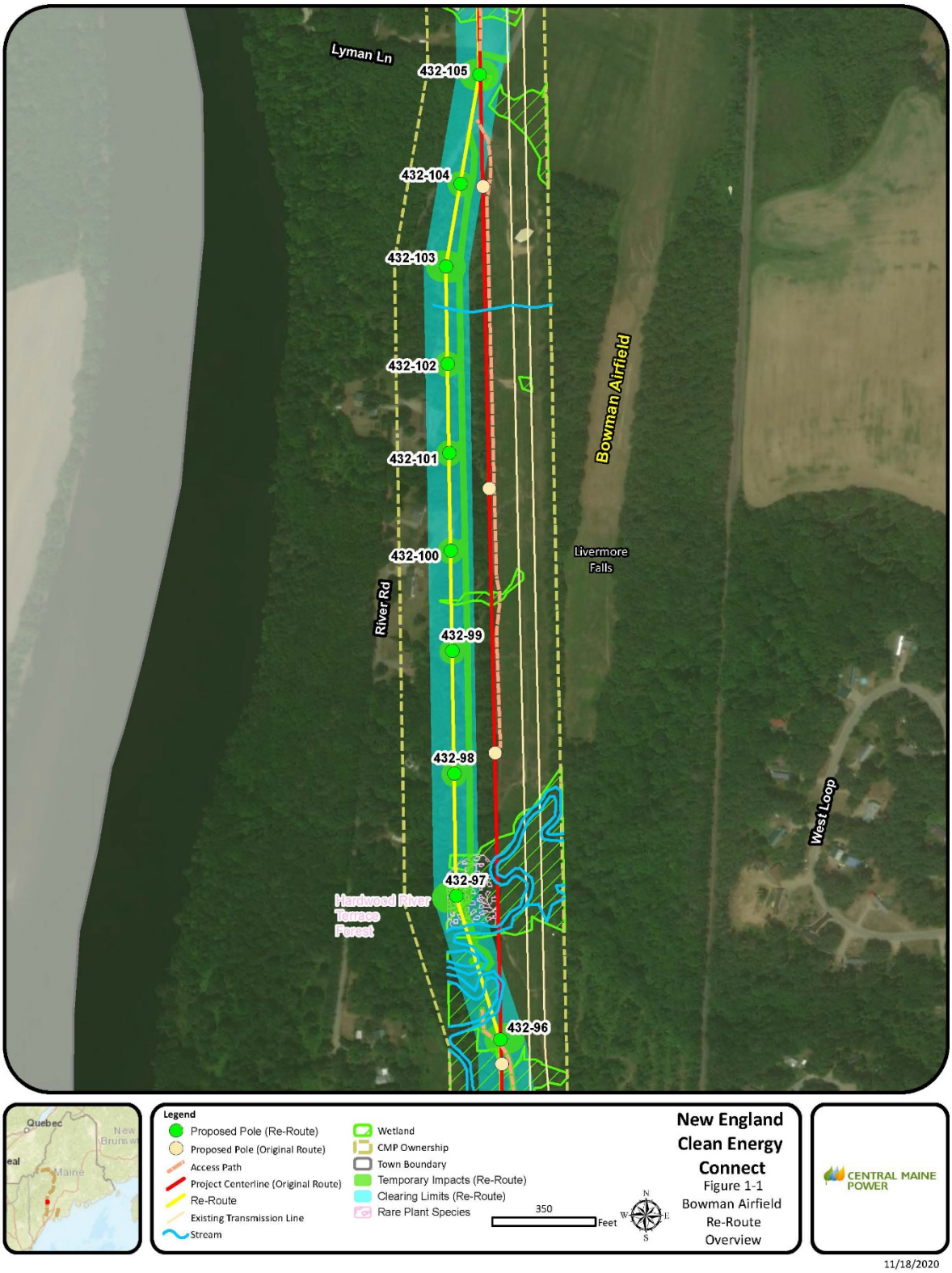
The Proposed Project would not affect the operation of railroads or airports.

One airport, Bowman Field is identified within 1 mile of the centerline of the Proposed Project. Bowman Field is 0.15 miles from the Segment 3 ROW in East Livermore (Livermore Falls). Bowman Field is a privately-owned public use airport located approximately 5 miles south of Livermore Falls (AirNav 2020; FAA 2020a). Bowman Field and the revised Segment 3 ROW are shown in Figure 3.13-4 (CMP 2020t). As of August 2019, the airport averaged 48 aircraft/week. The airport has one turf runway. Segment 3 is an existing ROW that would be expanded for the purposes of the Proposed Project.

Title 14 of CFR Part 77.9, *Notice Criteria*, requires project proponents to notify the Federal Aviation Administration for certain proposed structures constructed in the vicinity of airports. The FAA Part 77 Notice Criteria Tool (FAA 2020b) for the location of the proposed expansion and preliminary design indicates that FAA notification would not be required for the proposed expansion. Expansion of the ROW is therefore not expected to affect operation of the airport. The applicant evaluated Part 77 notification requirements for the Proposed Project during the Issued for Construction design phase of the project. Part 77 notification to FAA is not expected to be required based on the revised Issued for Construction project design.

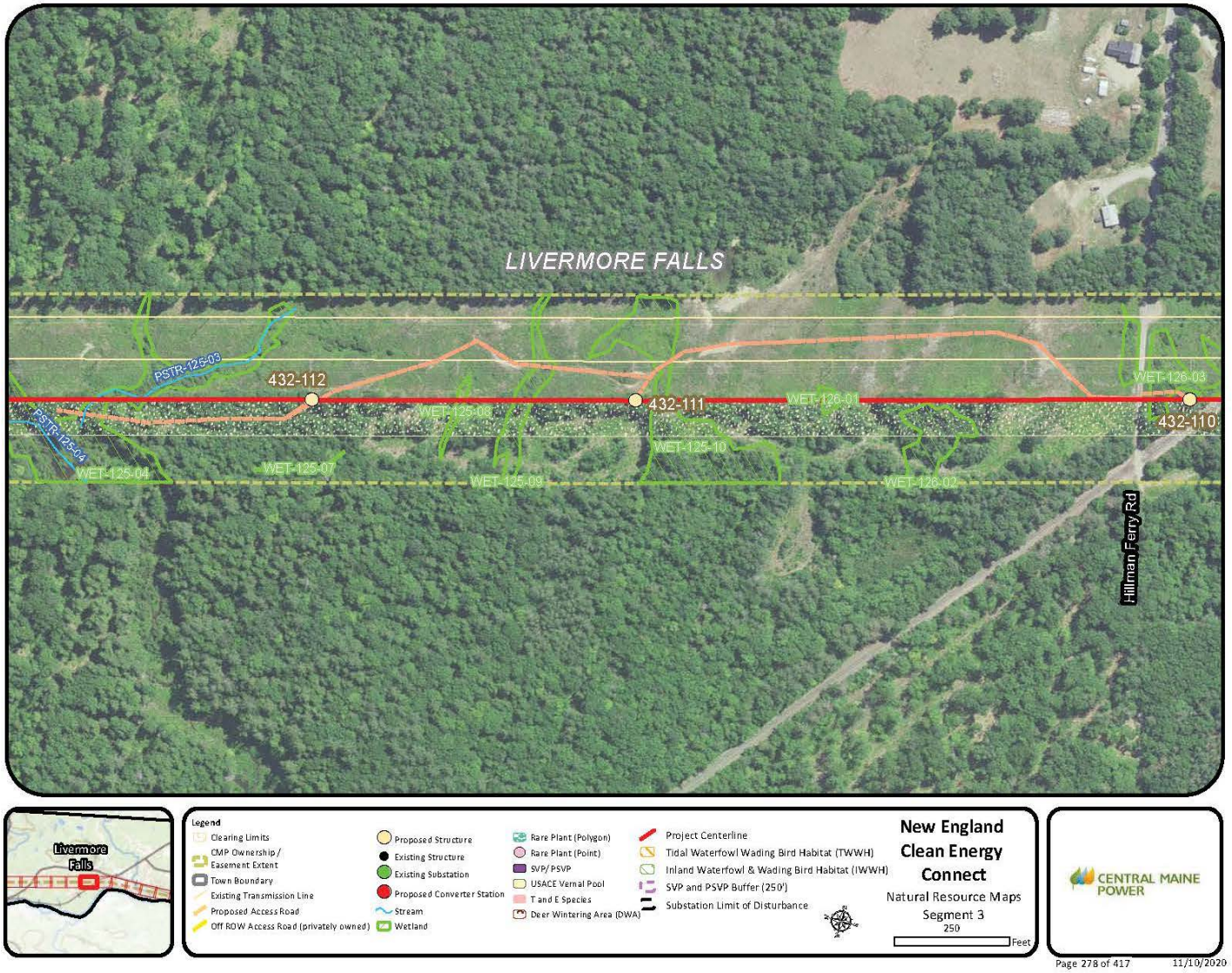
Based on the evaluation of the Issued for Construction design, a 0.62-mile portion of transmission line adjacent to the Bowman Airfield in Livermore Falls has been re-routed to the west (see Figure 3.13-4) of the existing corridor. As described in the Issued for Permitting design, the permitted design of the transmission line, in the vicinity of Bowman Airfield (B10) would follow a path parallel to the existing transmission line Sections 200 and 251 (on the eastern side of the corridor, nearest the airfield) within CMP held right-of-way. The Issued For Permitting design utilized this route to avoid the additional acquisition of land and impact to land/landowners outside of the right-of-way, and was the most effective use of right-of-way width. CMP contracted a Federal Aviation Administration (FAA) consultant to aid in the aeronautical impact study of this portion of the Project. Due to the proposed transmission line's proximity to the airfield, the aeronautical impact study determined the reroute was required to reduce aeronautical risk and increase structure distance from the glide path to improve safety. The re-route of the proposed transmission line near Bowman Airfield implements the minimum height structure design and is offset by a calculated distance west from the Issued For Permitting route to allow for the defined aeronautical surfaces to gain elevation as they rise in an outward direction from the airfield surface. Aligning with Project goals of efficient use of land and minimizing impact to landowners, the reroute near Bowman Airfield is the most effective use of land while conforming to FAA restrictions (CMP 2020t).

Segment 3 would cross a railroad ROW in East Livermore near Hillman Ferry Road. The Segment 3 railroad ROW crossing area in East Livermore is illustrated in Figure 3.13-5 and Figure 3.13-6. The proposed Segment 3 would also cross a railroad ROW in Lewiston at the Larrabee Road Substation. The proposed Segment 3 railroad ROW crossing area is illustrated in Figure 3.13-7. Construction of Segment 3 at the Larrabee Road Substation and in East Livermore for the Proposed Project would involve construction within the railroad crossing ROW. The applicant would coordinate with the railroad operator concerning construction activities and schedule so as not to disrupt railroad operations. Operation and maintenance of the Proposed Project would not affect railroad operations. The applicant would coordinate with the railroad operator for any maintenance activity that would involve work in or over the railroad ROW such that railroad operations would not be disrupted.



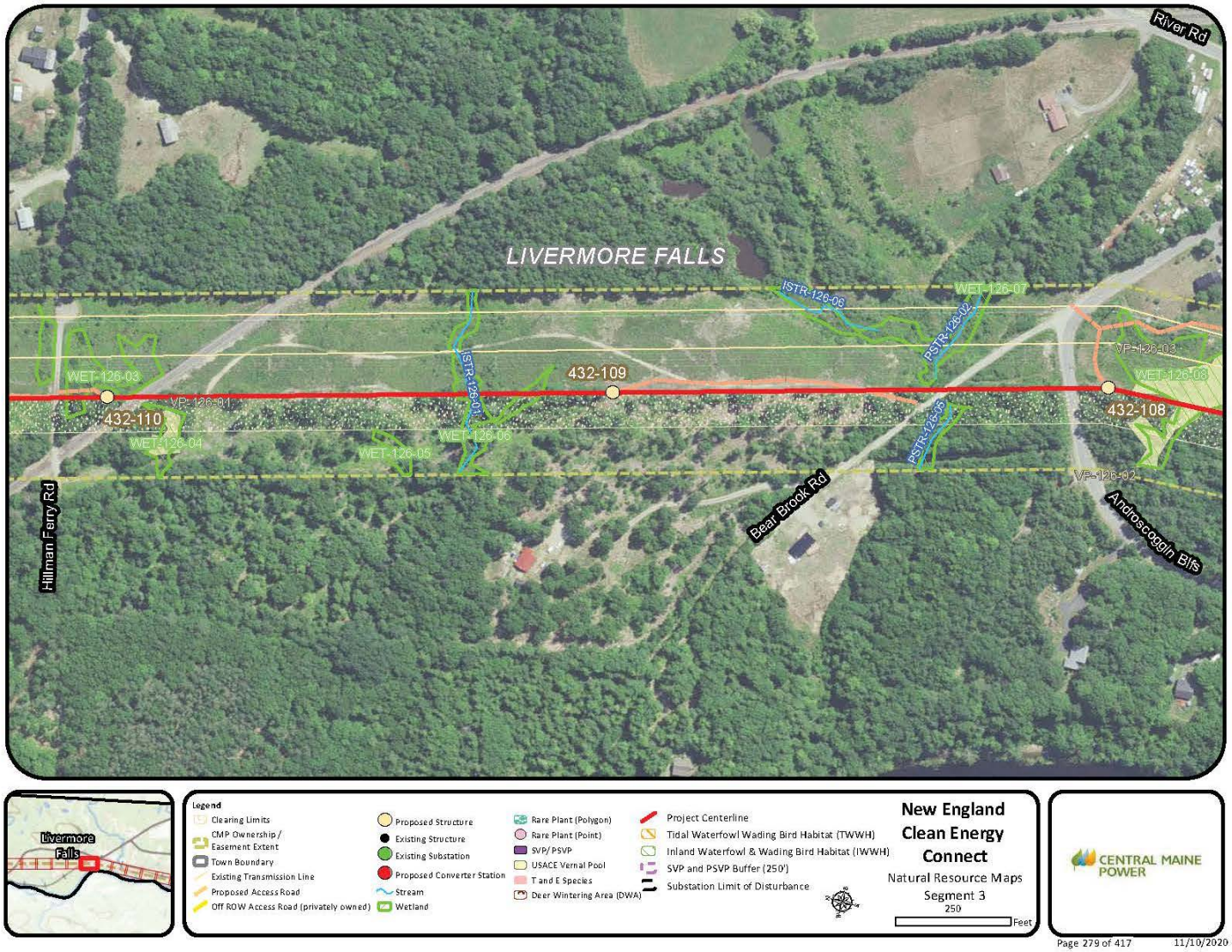
Source: CMP 2020t

Figure 3.13-4. Segment 3 – Bowman Field – East Livermore



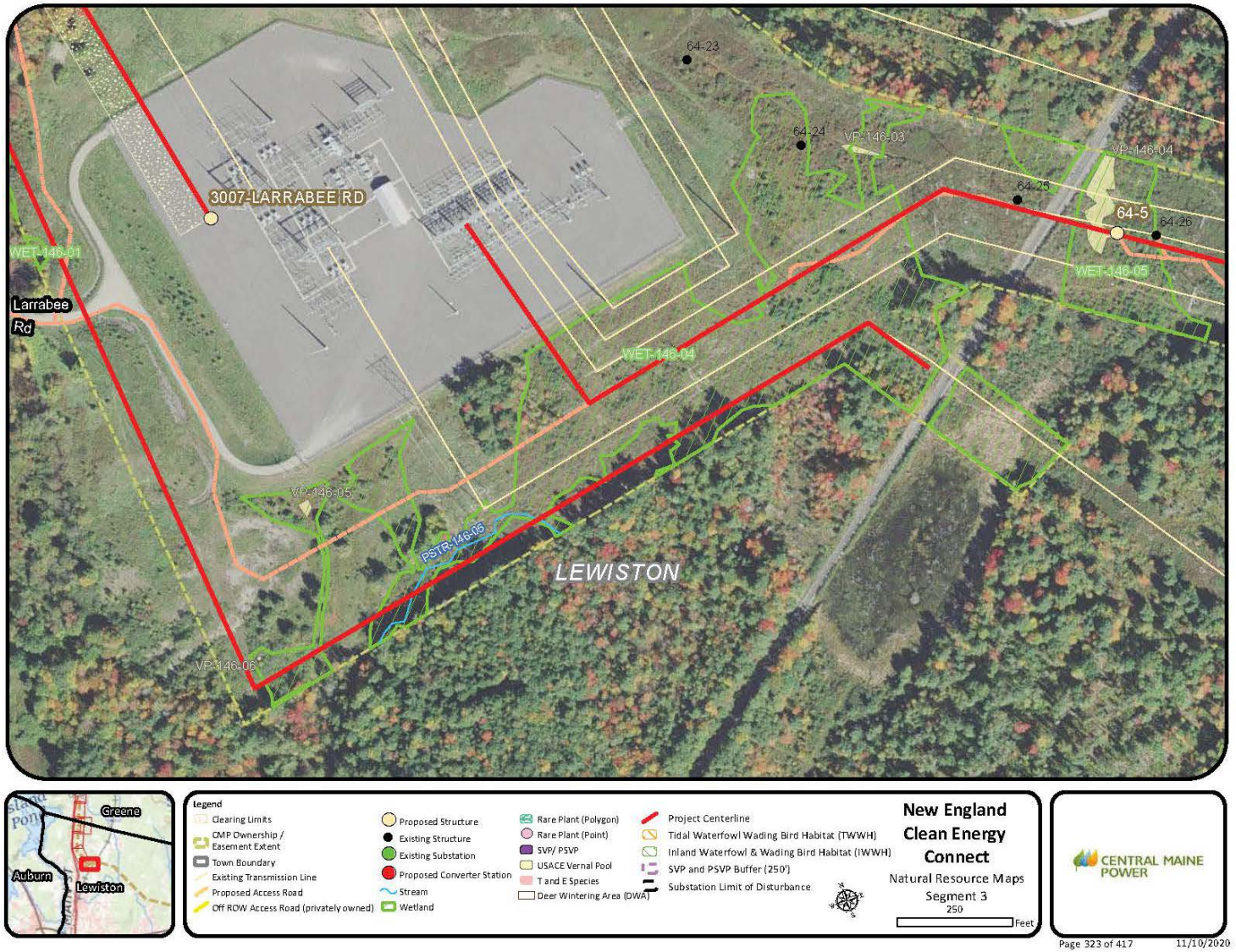
Source: CMP 2020t

Figure 3.13-5. Segment 3 Railroad ROW Crossing – East Livermore (Part 1)



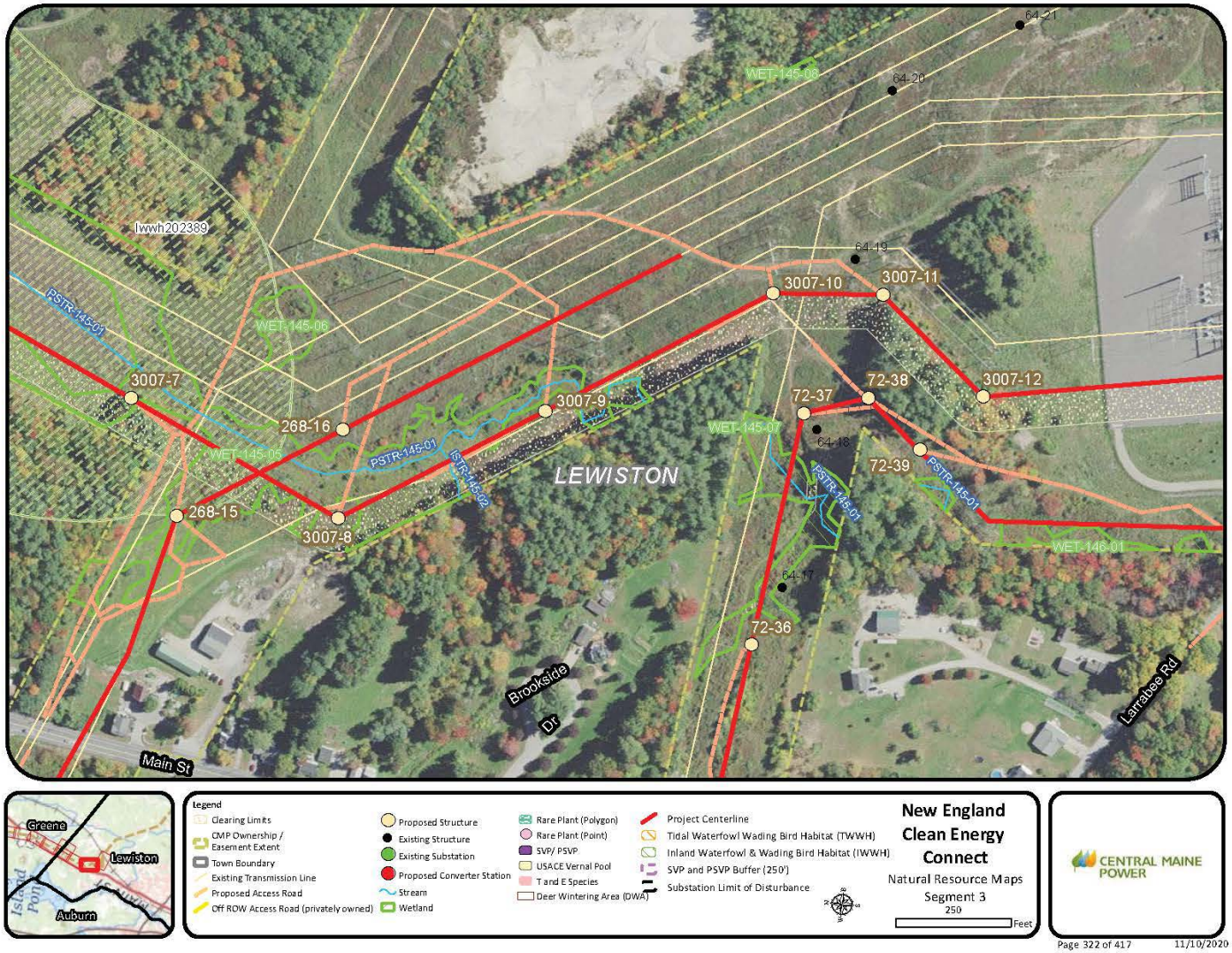
Source: CMP 2020t

Figure 3.13-6. Segment 3 Railroad ROW Crossing – East Livermore (Part 2)



Source: CMP 2020t

Figure 3.13-7a. Segment 3 Railroad ROW Crossing – Larrabee Road Substation



Source: CMP 2020t

Figure 3.13-8b. Segment 3 Railroad ROW Crossing – Larrabee Road Substation

Utilities and Stormwater Management

As noted in the MDEP Order, the Maine Site Law, in 38 M.R.S Section 484(4-A), requires an applicant to demonstrate that the proposed development meets the standards for stormwater management set forth in 38 M.R.S. Section 420-D and the standard for erosion and sedimentation control in 38 M.R.S. Section 420-C. Additionally, an applicant must demonstrate the proposed activity would not cause unreasonable erosion of soil or sediment. The Proposed Project would include approximately 8.2 acres of developed area, which would be impervious area at the proposed new converter station and substations (MDEP 2020: Page 100). The proposed transmission line corridor itself is not categorized as a developed area as defined in Chapter 500 because the corridor would not be mowed more than twice per year.

The applicant would develop stormwater pollution prevention plans (SWPPP) for construction areas and would obtain MDEP approval of construction plans as required for construction of stormwater management systems for the Proposed Project. The applicant would also implement vegetative and structural best management practices for stormwater management during construction of the Proposed Project.

Emergency Services

As cited in the MDEP Order, utility applicants "generally must show that the proposed use will not burden local public facilities and services" including "fire and ambulance services." In this regard, the MDEP Order includes the following requirement:

> Prior to construction, CMP will submit to the Land Use Planning Commission, written agreement(s) with state, local or private emergency service providers to ensure fire and emergency services are available at all times and at all locations of the Proposed Project within the Commission's jurisdiction during and following construction of the Proposed Project (MDEP 2020).

The applicant has established agreements with emergency service providers and has communicated these agreements to permitting authorities to comply with provisions of the MDEP Order and MPUC Order. The 2020 Annual Report on Fire and Medical Support Outreach and Communications (CMP 2020j) is submitted by the applicant in accordance with Paragraph 6 of MPUC's CPCN Order (MPUC 2020). The annual communication summarizes outreach and communications with the host communities regarding: 1) fire and medical support issues in comparable rural areas of its system; and 2) plans to address fire and medical support issues related to construction and operation. The applicant has established a subcontractor agreement for emergency service providers for construction activities for the Proposed Project (CMP 2020k). The applicant has established and implemented emergency response policies and procedures for its existing electric transmission system that would also apply to the Proposed Project construction and operation and maintenance. The Proposed Project therefore is not anticipated to disrupt emergency services or represent a burden to emergency service providers.

3.13.2.3 Applicant Committed Measures

The applicant would implement policies and procedures for construction, operation and maintenance of the Proposed Project that address potential impacts on airport and railroad operations, stormwater management infrastructure, transportation, and emergency service providers. Proposed methods for minimizing infrastructure impacts include the following:

- The applicant would secure all necessary approvals from Maine DOT, Franklin County, and Somerset County for the transportation of materials during and following construction of the Proposed Project in accordance with provisions of the Site Law Permit.

- The applicant would coordinate with railroad operators for Proposed Project construction and maintenance activities in or over railroad ROWs such that rail operations would not be disrupted by construction and maintenance of the Proposed Project.

- The applicant would evaluate the need for notification of FAA concerning potential impacts on airport operations in the detailed design phase of the project.

- The applicant would continue to coordinate and communicate with emergency service providers concerning construction and operation of the Proposed Project.

- The applicant would apply emergency response policies and procedures applicable to its existing electric transmission system to the Proposed Project construction, operation, and maintenance.

3.14 Human Health and Safety

3.14.1 Affected Environment

The analysis area for human health and safety consists of a 1,000-foot buffer of the transmission centerline and the edges of each existing and proposed substation.

3.14.1.1 Contractor Health and Safety

Existing conditions in the analysis area that may result in contractor health and safety concerns for the Proposed Project include risks associated with operation of vehicles and vehicle traffic, construction activities, heavy equipment installation and transportation, the potential to contact existing utility lines, and the potential to sever existing utility lines. Segments 2 and 3 are existing utility corridors in which applicant employees and contractors conduct operation and maintenance activities, including maintenance of electrical equipment and vegetation management. The applicant employees and contractors conducting operation and maintenance activities in the existing utility corridor are responsible for complying with Federal and state occupational health and safety regulations and are responsible for compliance with worksite safety policies and procedures.

3.14.1.2 Public Safety

Electric and Magnetic Field Safety

Anything that carries an electric current, including electric transmission cables, produces an electromagnetic field (EMF). Electrical fields are measured in units of kilovolts per meter (kV/m), and magnetic fields are measured in units of gauss (G). Environmental EMF exposures are generally small and more appropriately measured in milligauss (mG), or thousandths of a gauss. The strength of EMF increases as electric current increases but generally decreases with increasing distance from the source of the electric current. Public risks associated with EMF also vary with the type of electric power being produced. DC electric power does not induce electric currents in humans; however, AC electric power has been shown to create weak electric currents in humans (NIEHS 2002).

EMFs are phenomena that occur both naturally and as a result of human activity. Naturally occurring EMFs are caused by the weather and Earth's geomagnetic field. The public is exposed to EMF daily through the Earth's natural geomagnetic field (approximately 528 mG in the Proposed Project area (NCEI 2020) and through use of common household appliances (DOE 1996; Exponent 2015). The International Commission on Non-Ionizing Radiation Protection (ICNIRP 2010a) developed an exposure limit of 4,000,000 mG for the general public.

In the case of a transmission line, magnetic fields are created when current flows through the line. The strength of the fields is determined mainly by line current, line height, and distance. EMFs occur within the analysis area from other existing distribution and high-voltage transmission lines. There are currently no specific Occupational Safety and Health Administration standards that address exposure to EMFs.

Corona

Corona is a phenomenon associated with all energized transmission lines. Under certain conditions, the localized electric field near an energized conductor can be sufficiently concentrated to produce a tiny electric discharge that can ionize air close to the conductors (EPRI 1982). This partial discharge of electrical energy is called corona discharge or corona. Several factors, including conductor voltage; shape and diameter; and surface irregularities, such as scratches, nicks, dust, or water drops, can affect a conductor's electrical surface gradient and its corona performance. Corona is the physical manifestation of energy loss and can transform discharge energy into small amounts of sound, radio noise, heat, and chemical reactions of the air components. Corona is a type of EMF.

Corona noise occurs in areas where there are existing transmission lines in the analysis area. The level of noise associated with the corona effect strongly depends on weather conditions, as well as the condition of the transmission line. The Proposed Project location is a humid continental climate having humid summers and cold winters. Corona noise is more common during foul weather or rain conditions. The applicant selected conductor sizes that, under dry conditions, are designed to be nearly noise free. All sound levels produced by proposed new and upgraded transmission lines were modeled and are anticipated to remain within the levels allowed by MDEP. Corona discharges occur within the analysis area from other existing distribution and high-voltage transmission lines within the existing Segment 2 and Segment 3 utility corridors.

Contaminated Soils and Groundwater

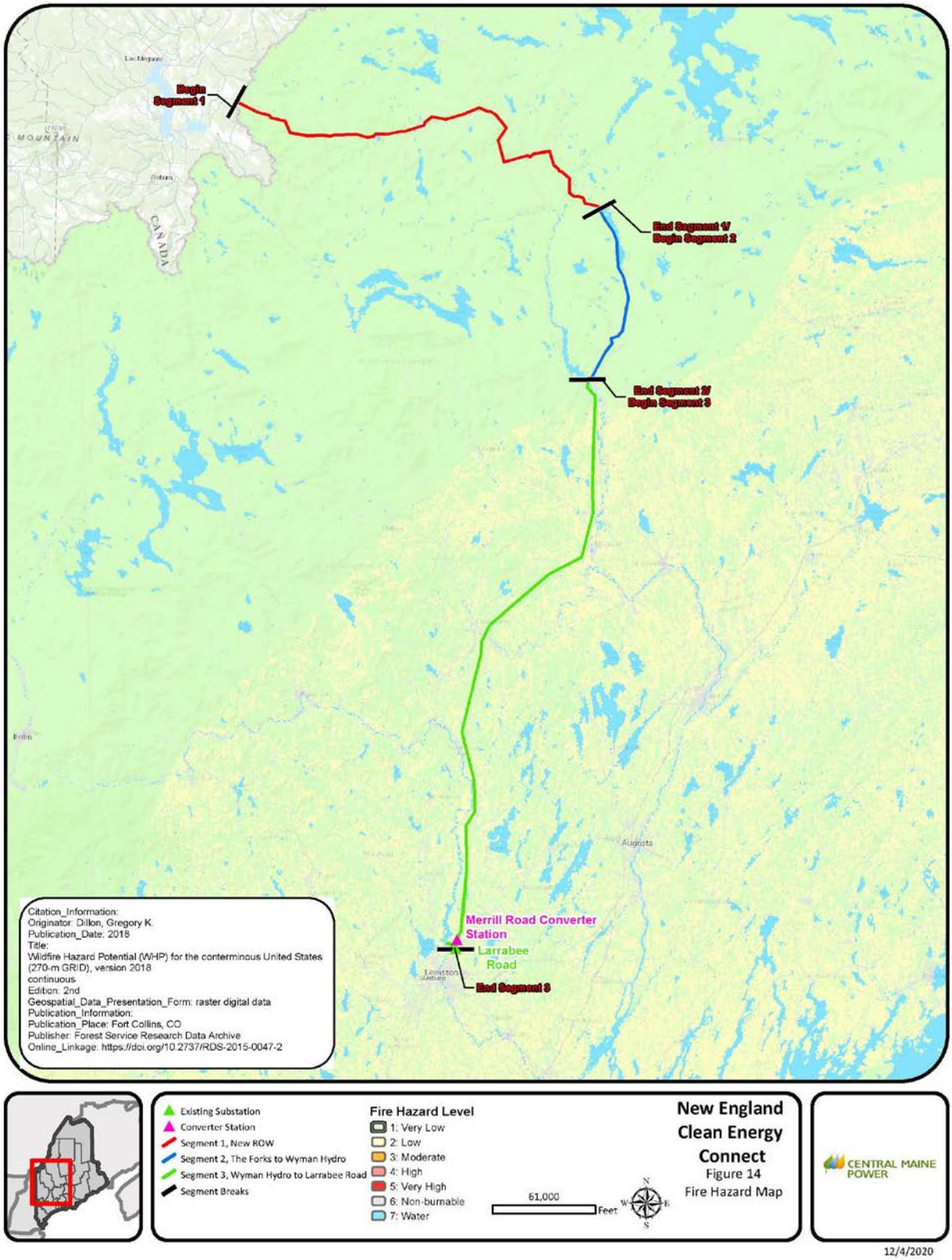
Publicly available databases were searched to gather information regarding known sites of environmental concern within the analysis area. Sites of potential environmental concern include, but are not limited to, Superfund sites, underground storage tanks (USTs)/leaking USTs (LUST), and USEPA-permitted facilities. USEPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) contains data on potentially hazardous waste sites that have been reported to USEPA, as well as sites listed on the National Priorities List (NPL). USEPA and MDEP databases were queried to identify sites of potential environmental concern in relation to the analysis area. There are no USEPA NPL sites or non-NPL CERCLIS sites in the analysis area for Segment 1, Segment 2, or Segment 3 (CMP 2020l). There are no LUST sites in the analysis area for Segment 1, Segment 2, or Segment 3 (CMP 2020l).

Lightning

Thunderstorms are most common in Maine in the summer months and can be associated with lightning. In the United States, there are between 20 and 25 million cloud-to-ground lightning flashes each year. Maine averages about 60,000 flashes each year (MEMA 2020). Maine averages less than 20 cloud-to-ground flashes per square mile per year (Earth Networks 2020).

Fire

The USDA Forest Service Wildfire Hazard Potential Map (USDA 2018) depicts that the existing and proposed transmission line ROW and project area is classified as "Low" or "Very Low" risk of wildfires. Fire hazard classifications of the Proposed Project area are shown in Figure 3.14-1.



Source: CMP, December 2020

Figure 3.14-1. Fire Hazard Map

3.14.2 Environmental Consequences

3.14.2.1 Impact Analysis Area and Indicators

The analysis area for impacts on human health and safety is 1,000-foot from the transmission centerline and from edges of each existing and proposed substation.

The following indicators were considered when analyzing impacts on human health and safety:

- Potential impacts on contractor health and safety
- Potential for contamination of soils and groundwater within the ROW
- Potential impacts from electromagnetic fields and corona

3.14.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project; the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Contractor Health and Safety

The applicant's employees and contractors conducting operation and maintenance activities in the existing utility corridor are responsible for complying with Federal and state occupational health and safety regulations and are responsible for compliance with the applicant's worksite safety policies and procedures. The applicant's employees and contractors conducting construction of the Proposed Project and operation and maintenance of the Proposed Project would also be subject to Federal and state occupational health and safety regulations and compliance with the applicant's worksite safety policies and procedures. In addition to the applicant's existing health and safety policies for system operation and maintenance, the applicant has established contractor health and safety requirements specifically for the Proposed Project construction (CMP 2020m) and in 2020 updated the Environmental, Health, and Safety Management Manual (CMP 2020n) and Emergency Readiness and Response Procedures (CMP 2020o). Implementation of the applicant's health and safety policies and procedures for compliance with Federal and state occupational health and safety requirements would provide safe working environments for the applicant employees and contractors.

Soil Contamination and Groundwater

The proposed transmission lines and substations would contain hazardous materials, including transformer oil. Equipment containing oil at the existing Larrabee Road Substation and the proposed new Merrill Road Converter Station would be equipped with secondary containment systems and would be subject to monitoring and inspection programs in accordance with provisions of the SPCC Plans for the substations. Therefore, no soil or groundwater contamination would be anticipated from these elements of the Proposed Project. Temporary fuel storage equipment that would be used for fueling of construction and maintenance equipment would also be subject to siting, secondary containment, monitoring, and

inspection requirements. Therefore, no releases of fuel into the soil or water would be anticipated from construction, operation, and maintenance of the Proposed Project. Any spills or leaks resulting from unforeseen occurrences would be managed and remediated in accordance with the applicant's SPCC Plans and spill response procedures.

Contractors would conduct construction activities pursuant to MDEP Construction General Permit and a SWPPP for the discharge of stormwater and dewatering wastewaters from construction activities. A construction permit and SWPPP would be required prior to commencement of construction activities.

Although considered to be unlikely, it is possible that areas of contamination would be encountered during construction. If suspected contamination would be encountered during construction (as indicated by field observation or odor), project work would cease at the subject location until the potential contamination would be sampled and characterized and a management strategy developed.

If contamination would be discovered in excess soils after-the-fact, the rejected soils would be redirected to an appropriate disposal facility based on the type of contamination discovered. Furthermore, the soils in the Proposed Project area where the unanticipated contaminated soil originated would be sampled and characterized, and the boundaries of any contamination would be delineated prior to commencing any off-site transport and disposal activities along the affected portion of the ROW.

EMF and Corona Effect

As part of MPUC Docket No. 2017-00232, CMP retained Exponent, Inc (William Bailey, Ph.D.) to calculate the electric- and magnetic-field levels and ion densities for the transmission lines associated with the NECEC project. CMP did so because, as part of the MPUC's consideration of "public health and safety" as one of several enumerated factors the Commission must consider in determining the "public need" for a proposed transmission line under 35-A M.R.S. Section 3132(6), the Commission has historically considered electric- and magnetic-field impacts on the surrounding environment. Exponent's calculations and findings are set forth in its report entitled *Modeling of the Electrical Environment, New England Clean Energy Connect Transmission Project* dated January 11, 2018 (Exponent 2018), which was filed in the MPUC Docket as Exhibit NECEC-16 on January 12, 2018.

To prepare its report, Exponent modeled the electrical environment around the proposed NECEC transmission lines in order to calculate the static electric fields, static magnetic fields and ion densities for each Proposed Project segment containing a DC line and the AC electric and magnetic fields for each project segment containing an AC line. The Proposed Project included segments that contained just the proposed DC line, a combination of the DC line and one or more AC lines and just an AC line. The Exponent Report describes in detail the modeling techniques and assumptions and the formulae and empirical curves used in these calculations. Exponent then compared its study results against relevant environmental assessment standards and guidelines.

For the DC transmission line segments, Exponent considered the guidelines for exposure to static electric and magnetic fields published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the Food and Drug Administration (FDA) and the threshold value for human perception noted by the National Radiological Protection Board of Great Britain (NRPB). The criteria used by Exponent for the evaluation of the DC line on the surrounding electrical environment are listed in the following Table 2, reproduced from Exponent's Report.

Table 2. Environmental assessment standards and guidelines for static fields

Electrical Parameter	Limit	Agency providing guideline (year)	Comment
Static electric field	25 kV/m	NRPB (2004)	Threshold value above which annoying perceptions may occur
Static magnetic field	4,000 G	ICNIRP (2009)	Continuous exposure of the general public
	40,000 G (infants) 80,000 G (adults)	FDA (2014)	Patient MRI exposure
Space charge*	-	-	No health guideline proposed

* No scientific or regulatory agency has determined that small air ions, ion current density, or charged aerosols pose a threat to the environment or to human health, so no exposure guidelines have been proposed. The Ministry of Health of the Russian Federation, however, recommended that positive and negative air ion levels be maintained between a minimum of 400 ions/cm^3 and a maximum of 50,000 ions/cm^3 for public and industrial quarters (MHRF, 2003). The scientific basis for determining the guideline levels was not described.

Source: Exponent 2018.

For the AC transmission line segments, Exponent considered the exposure limits for 60-Hz electric and magnetic fields published by the International Committee on Electromagnetic Safety (ICES) and ICNIRP. ICNIRP and ICES each specify both Basic Restrictions (the prescribed limits on internal body exposure) and reference levels for the environments of the general public and workers with 60- Hz electric and magnetic fields that can be measured or calculated to assure compliance with the Basic Restrictions. Basic Restrictions limit the maximum recommended electric fields induced in body. The criteria used by Exponent for the evaluation of the AC transmission lines on the surrounding electrical environment are listed in the following Table 3, reproduced from Exponent's Report.

Table 3. Guidelines for environmental assessment of AC fields from AC transmission lines

Electrical Parameter	Limit*	Agency Providing Guideline (Year)	Comment
AC electric field	4.2 (36.4) kV/m	ICNIRP (2010)	General public exposure
	5.0 (26.8) kV/m†	ICES (2002)	
AC magnetic field	2,000 (12,400) mG	ICNIRP (2010)	General public exposure
	9,040 (9,150) mG	ICES (2002)	

* For electric fields and magnetic fields, both reference levels and Basic Restrictions are shown. Reference levels quoted from the respective standard are listed first; the limits (i.e., Basic Restrictions) derived by mathematical modeling described by Kavet et al. (2012) at 60 Hz are shown in parenthesis.

† There is an exception within transmission line ROWs, where the limit is 10 kV/m, because people do not spend a substantial amount of time in ROWs and very specific conditions are needed before a response is likely to occur (i.e., a person must be well insulated from ground and must contact a grounded conductor) (ICES, 2002, p. 27).

Source: Exponent 2018.

The results of Exponent's study and its findings with respect to the applicable standards and guidelines as set forth on page ix of the Exponent Report are as follows:

Static Electric and Magnetic Fields: The DC line would produce static electric and magnetic fields similar to those encountered in the natural environment, with magnetic-field levels similar to the Earth's static geomagnetic field and electric-field levels similar to those produced by atmospheric phenomena, weather, and friction charging. The calculated static electric-field levels everywhere on the route are below NRPB's recognition that static fields above 25-kV/m may be annoying (NRPB 2004), and the static magnetic-field levels are likewise well below the ICNIRP and FDA guidelines (FDA 2014; ICNIRP 2009) for static magnetic-field exposure.

Space Charge: Neither the federal government nor the State of Maine has standards or guidelines for ion density associated with transmission lines. The calculated ion densities outside the ROW of the DC only and combined DC+AC segments would be within the range of levels otherwise encountered in the environment.

AC Electric and Magnetic Fields: The AC transmission lines would produce 60-Hz AC electric and magnetic fields that are calculated to be below the ICNIRP and the ICES assessment criteria on public exposure and AC electric-field levels on transmission line rights of way (ICES 2002; ICNIRP 2010b).

No party in the MPUC proceeding offered any evidence to contradict Exponent's results and findings and the MPUC concluded in its May 3, 2019 CPCN Order at page 50 that the applicant, through the submission of the Exponent report among other evidence, satisfied its filing requirements relating to public health and safety under Maine law and provided a sufficient basis for the Commission to consider these issues.

Lightning

The design process and standards applicable to the Proposed Project would ensure the structural integrity and safe operation of the proposed transmission line. The design process would determine appropriate insulation levels to address lightning and electrical parameters. The steel poles used for the proposed transmission line provide the benefit of giving any potential lightning strikes a better path to ground that would other types of pole design. The Proposed Project would meet all National Electrical Safety Code requirements and use shield wire throughout its length. A variety of typical overhead shield wires would be used to provide lightning protection for improved reliability. The poles and shield wire would intercept and shunt potential lightning strikes directly to ground and minimize lightning strikes to nearby facilities at a lower height than the poles. The Proposed Project, therefore, would not be expected to impact human health and safety related to lightning.

Fire

As shown in Figure 3.14-1, the existing and proposed ROW and the project area are classified as "low" or "very low" fire risk. The MPUC Order (MPUC 2020) found that the applicant has adequately addressed fire safety concerns throughout other remote areas of CMP's existing transmission system. The MPUC directed the applicant to, as part of its ongoing outreach and communications with host communities, provide direct and clear information to the affected community about how the applicant (1) has dealt with fire and medical support issues in comparable rural areas of its system and (2) plans to deal with fire and medical support issues in the context of the NECEC. The applicant has provided annual communications to host communities (CMP 2020p).

The Proposed Project design, including the use of steel poles, lightning protection, and other fire protection and safety systems would reduce the risk of fire. Fire risk and fire protection systems are described in the NECEC Project Responses to USACE March 3, 2020 Post-Public Hearing Data Request (CMP 2020p). A principal cause of fires for transmission systems designed to standards and codes is lack of adequate maintenance; CMP has implemented vegetation management systems for CMP's existing transmission lines and would implement post-construction vegetation management for the Proposed Project. The applicant would maintain the transmission line and vegetation in the ROW to meet National Electric Safety Code (NESC) clearances, as is the case for CMP's existing transmission lines. The fire risk associated with the Proposed Project would be similar to the fire risk for CMP's existing transmission line operations in Maine.

3.14.2.3 Applicant Committed Measures

The applicant would implement health and safety protection policies and procedures for construction and operation and maintenance of the Proposed Project that address contractor health and safety, electromagnetic field and corona effects, and the potential for spills or other accidental releases of hazardous materials to the environment. Proposed methods for minimizing human health and safety impacts include the following:

- Contractor health and safety impacts would be reduced through implementation of safety management plans and emergency preparedness and response plans for construction, operation, and maintenance of the Proposed Project. These plans and procedures include Construction Safety Management, Emergency Readiness and Response, Environmental, Health, and Safety Management, and Contractor Safety Guides and Manuals (CMP 2020m, 2020n, 2020o, 2017c, 2018c). These plans and procedures establish project management requirements for contractor procurement, safety communication, and safety compliance; identify safety roles and responsibilities for the applicant's employees, contractors, and vendors; and establish policies and procedures for maintaining safe work practices and safe work environments.

- Corona discharges (and associated audible noise, radio noise, light, heat, and small amounts of ozone) would be minimized in the design process by selecting conductors appropriately sized for the operating voltage of the line and in accordance with Federal Energy Regulatory Commission standards (CMP 2020p).

- Fire risks would be reduced through design and maintenance of the proposed transmission line ROW to applicable code clearances and implementation of a post-construction vegetation management plan and scheduled transmission equipment inspection and maintenance procedures (CMP 2020c, 2020d).

3.15 Hazardous Material and Waste

3.15.1 Affected Environment

The analysis area for hazardous materials and waste consists of a 1,000-foot buffer around the Proposed Project centerline and from the edges of the existing and proposed substations. The analysis area includes both developed and undeveloped areas and forest land, including the existing utility corridors in Segments 2 and 3. Under the federal Resource Conservation and Recovery Act and state statutes and codes modeled on the federal law, MDEP has the authority to monitor and direct businesses that may generate, transport, or dispose of hazardous waste in Maine. As the analysis area is a mixture of residential, commercial, light industrial, and undeveloped land, there are no widespread prior or current industrial uses that would suggest a concentration of hazardous waste sites or solid waste disposal sites would be present in the analysis area. CERCLIS and LUST environmental resource records were researched in the analysis area in Segment 1, Segment 2, and Segment 3.

3.15.2 Environmental Consequences

3.15.2.1 Impact Analysis Area and Indicators

The analysis area for impacts for hazardous materials and wastes is a 1,000-foot buffer from the transmission centerline and from the edges of each existing and proposed substation.

The following indicators were considered when analyzing impacts on hazardous materials and hazardous and solid wastes:

- The presence of known hazardous waste sites within the analysis area and the type, nature, status, and proximity of those sites to the Proposed Project
- The presence, transportation, storage, use, and disposal of hazardous materials during construction, operation, and maintenance of the Proposed Project

3.15.2.2 Impact Analysis

No Action Alternative

Under the No Action Alternative, DOE would not issue a Presidential permit to the applicant for the Proposed Project; the transmission system would not be authorized to cross the United States–Canada border, the Proposed Project would not be constructed in the United States, and the potential environmental impacts associated with the Proposed Project as discussed below would not occur.

Proposed Project

Hazardous Materials

Construction

Diesel fuel and gasoline would be transported to, stored at, and used on site for project construction. Diesel fuel consumption would be 998,400 gallons/year, 2,496,000 gallons total for the construction period, and gasoline consumption would be 249,600 gallons/year (624,000 gallons total for the construction period). Specific locations for temporary fuel storage along the proposed transmission line corridors have not yet been identified and would be identified during the detailed design phase of the Proposed Project. Restrictions for where fuel may be temporarily stored during construction have been established for the Proposed Project. These restrictions, procedures, storage and handling requirements, secondary containment requirements, cleanup and spill reporting requirements, are described in the CMP Environmental Control Requirements (CMP 2017b) and Construction and Post-Construction Vegetation Clearing Plans (CMP 2020c, 2020d). The applicant provided updates to the Plan for Protection of Sensitive Natural Resources During Initial Vegetation Clearing (VCP) and to the Post-Construction Vegetation Maintenance Plan (VMP), collectively referred to as the Vegetation Management Plans, in a Condition Compliance application filed with the MDEP on November 9, 2020.

Regulated hazardous wastes and universal wastes (e.g., used aerosol cans) may be generated incidentally as a byproduct of transmission line or substation construction activities. In the event they are identified, CMP's Environmental Control Requirements, dated February 2017, establish overall requirements for properly managing, storing, transporting and using oil and hazardous materials during construction, and for properly managing any hazardous wastes generated during construction. In addition, contract specifications for waste handling and minimization provided in CMP's October 19, 2018 Response to the MDEP information request (CMP 2018d), include requirements for hazardous waste handling and licensed disposal facilities.

Operation and Maintenance

The following hazardous materials are routinely found and/or used as part of CMP's on-going operations and maintenance of substations and transmission corridors:

- Compressed gases such as nitrogen in cylinders and substation transformers, sulfur hexafluoride (SF_6) in cylinders and substation breakers, welding gases
    - Diesel fuel for refueling of equipment
    - Gasoline for chainsaw operation
    - Sulfuric acid (lead-acid batteries) in the substation control houses
    - Other small quantities of products considered Materials of Trade such as aerosols, solvents, and rechargeable batteries

In addition to hazardous materials, mineral oil can be found in the following substation equipment:

- Transformers
    - Regulators
    - Oil-filled circuit breakers
    - Smaller oil-filled equipment such as capacitors, reclosers, etc.

Equipment at the proposed new Merrill Road Converter Station is estimated to contain 135,000 gallons of oil, as follows:

- **Converter transformer oil**: 30,000 gallons per transformer (120,000 gallons for the site)
- **Generator fuel**: 6,000 gallons total.
- **Auxiliary transformers oil**: 500 gallons per transformer (1,000 total for the site)
- **Cooling plant volume** (glycol): 8,000 gallons for the site.

As a result, an SPCC plan would be required for the proposed converter station. The SPCC Plan would be prepared prior to the delivery of regulated materials to the site. The existing Larrabee Road Substation has an existing SPCC plan which would be updated prior to the delivery of the estimated 25,405 gallons of oil that would be contained within the new transformer proposed at that facility. No other facilities in Segments 1, 2, and 3 of the Proposed Project would require oil storage at quantities requiring an SPCC plan.

The proposed Merrill Road Converter Station would include a water supply well and 2,000-gallon concrete wastewater holding tank for sanitary facilities at the service building. The converter station would be staffed intermittently and the expected water usage and wastewater generation for the facility would not be more than that for a single-family residence. The Maine Department of Health and Human Services (DHHS) Division of Environmental Health calculates water use at places of employment at 15 gallons per employee per day. Under these standards it is estimated that the proposed Merrill Road Converter Station could use up to approximately 100 gallons of water per day. The actual average water usage and wastewater generation are expected to be much lower, as the converter station will be staffed only very infrequently by small maintenance crews. The wastewater holding tank would be installed and pumped and serviced by a professional septic pumping service as necessary, in accordance with Chapter 20 of the Maine Subsurface Wastewater Disposal Rules. An HHE-200 Subsurface Wastewater Disposal

System Application Form has been completed by the applicant for the proposed wastewater holding tank (CMP 2020t).

As referenced in the MDEP Site Law Application, Section 15.0 (2017), substations and transmission line facilities constructed and/or modified as part of the Proposed Project would include equipment that contains fuels and lubricants, as well as oil-filled electrical components (NECEC 2017). As with existing CMP substations, Spill Prevention, Control, and Countermeasure (SPCC) Plans would be prepared to address potential leaks for each of these substations in accordance with the requirements of 40 CFR Part 112. As well, NECEC substations (new and modified) would be constructed with engineered perimeter and/or subsurface oil containment in order to minimize the potential for oil releases to reach navigable waters.

Transportation

Hazardous materials including compressed gases, flammable liquids, and corrosive liquids would be transported to the Proposed Project during construction, operation, and maintenance. Some hazardous materials, e.g., sulfuric acid, would be transported within sealed equipment (e.g., lead-acid batteries). Other hazardous materials would be transported in containers (e.g., compressed gas cylinders, totes). Materials would be transported either by the applicant's personnel or by licensed transporters. Transportation would be on public roads or private roads (there are no public roads that access the proposed Segment 1. Transportation of hazardous materials is subject to U.S. Department of Transportation regulations and Maine Department of Transportation regulations. CMP and its contractors transport hazardous materials in the conduct of operation and maintenance of CMP's existing transmission lines in Maine, including transport on public and private roads. Hazardous materials that would be transported on public and private roads for operation and maintenance of the Proposed Project are listed in Table 3.15-1.

Table 3.15-1. Hazardous Materials Transport for Operation and Maintenance of the Proposed Project

Hazardous Material	Material Type	Locations	Methods of Transportation	Storage/Containers
Acetylene	Compressed Gas	Substations	Company or vendor welding truck dispatched from NASC facility	Cylinders are stored on truck or in designated area at NASC facility
Argon	Compressed Gas	Substations	Company or vendor welding truck dispatched from NASC facility	Cylinders are stored on truck or in designated area at NASC facility
Carbon dioxide	Compressed Gas	Substations	Company or vendor welding truck dispatched from NASC facility	Cylinders are stored on truck or in designated area at NASC facility
Compressed air	Compressed Gas	Substations	Company or vendor welding truck dispatched from NASC facility	Cylinders are stored on truck or in designated area at NASC facility
Diesel Fuel	Flammable Liquid	Transmission Corridor	Company or vendor vehicle	Less than 55-gallon containers on truck
Gasoline	Flammable Liquid	Substations, Transmission Corridor	Company or vendor vehicle	5 gal containers or less on truck or flammable storage cabinet at service center
Nitrogen	Compressed Gas	Substations	Company or vendor vehicle	Compressed gas cylinder, transformers
Oxygen	Compressed Gas	Substations, Transmission Corridor	Company or vendor vehicle	Compressed gas cylinder
SF_6	Compressed Gas	Substations	Company or vendor vehicle	Compressed gas cylinder, gas breakers

Sulfuric Acid	Corrosive Liquid	Substations	Company or vendor vehicle	Lead-acid batteries, wet-cell
Mineral Oil, Non-PCB	Flammable Liquid	Substations	Company tank truck or tote	NASC facility, substations equipment
Hydraulic Fluid	Flammable Liquid	Substations, Vehicles, Tools, Equipment	N/A	Within hydraulic tools, equipment and vehicles

Source: CMP December 2020q.

Hazardous and Solid Wastes

Table 3.15-2 provides the amounts and types of solid waste that would be generated from clearing, grading, excavation and other project construction activities for Segments 1, 2, and 3.

Table 3.15-2. Solid Waste Generation from Construction of Proposed Project

Material	Estimated Disposal Quantity[1] (cubic yards)	Estimated Disposal Quantity[1] (short ton)
Wood (timber, slash, stumps, etc.)	23,220	3,483
Treated wood (poles, cross arms)	464	70
Metals (Ferrous and Non-Ferrous)	19	10
Porcelain Insulators	8	3
Food waste, plastics, common trash	39	7
Wooden Cable Spools & Pallets	93	13
Wooden Insulator Crates	6	1
Concrete Debris	19	39
Spoils (Transmission Lines)	4,412	4,853
Spoils (Substations)	23,994	26,393
Spoils (HDD)	774	851
Total	53,048	35,723

Source: CMP December 2020r.

Table 3.15-3 provides a summary of the types of solid, hazardous, and universal wastes anticipated to be generated from Proposed Project operation and maintenance activities, including the locations of generation and expected methods of storage, transport, and disposal.

Table 3.15-3. Solid, Hazardous, and Universal Waste Generation from Operation and Maintenance of Proposed Project

Waste type	Location generated from	Storage	Transportation/Management/ Disposal Method	Quantity
Aerosols (empty)	Substations, Transmission	Service Center MSW dumpster	Ship to licensed Solid Waste Disposal Facility	Incidental, but < 220 lbs. per year
Aerosols (some contents remaining)[1]	Substations, Transmission	Service Center Hazardous Waste Storage Area	Ship to licensed Hazardous Waste Disposal facility	Incidental, but < 220 lbs. per year
Treated Wood (poles, crossarms)	Transmission	Service Center Treated Wood dumpster	Donate (in accordance with CMP Treated Wood Policy); landfill in licensed special waste landfill, or reuse by CMP	Only generated when a structure is removed/replace
Batteries-Lithium, Lithium Ion, NICAD, NiMH, Small Sealed Lead, Acid, Other Rechargeable Batteries[2]	Substations, Transmission	Service Center Universal Waste Storage Area	Ship to a licensed Universal Waste Recycling facility	Varies depending on project scope/maintenance schedule

Waste type	Location generated from	Storage	Transportation/Management/ Disposal Method	Quantity
Lead-Acid Batteries, Wet-Cell[2]	Substations	NASC facility or substation	Recycle in accordance with Federal Universal Waste Rules	Only generated when a battery is occasionally replaced, or battery bank is upgraded
Scrap Metal	Substations, Transmission	Service Center scrap metal dumpster or gaylord	Recycle by Schnitzer (Auburn) or a similar metal recycling company	Varies based on project scope
Porcelain	Substations, Transmission	Service Center MSW dumpster	Ship to licensed Solid Waste Disposal Facility	Only generated when insulator is damaged, or insulators are replaced
Non-PCB Mineral Oil	Substations	NASC facility or substation	Transported to CMP's NASC facility for reuse or to burn in waste oil boiler to heat the building, or transport to licensed facility	Only generated when equipment and/or oil is replaced
Oil-filled electrical equipment	Substations	NASC facility or substation	Transported to CMP's NASC facility for reuse or transport to licensed facility	Only generated when equipment is replaced
Cardboard	Substations, Transmission	Service Center containers	Send to recycling facility Eco-Maine or similar	Varies based on project scope
Paper	Substations, Transmission	Service Center containers	Send to recycling facility Eco-Maine or similar	Incidental, but < 220 lbs. per year
Oily rags & absorbent	Substations	NASC facility	Send to licensed facility for incineration	Varies depending on project scope/maintenance schedule
Solvent rags	Substations	Service center hazardous waste storage container	Ship to licensed Hazardous Waste Disposal facility	Incidental, but < 220 lbs. per year
Spoils	Substation, Transmission	N/A	Waste will be evaluated on a case specific basis; beneficially reused when possible and managed in accordance with CMP / Avangrid Environmental Policies and Procedures	Varies depending on project scope
Concrete	Substation, Transmission	N/A	Managed as inert fill or ship to licensed Solid Waste Disposal Facility	Varies depending on project scope
Trash (food waste, Styrofoam, etc.)	Substation, Transmission	Service Center MSW dumpster	Ship to licensed Municipal Solid Waste ("MSW") landfill, transfer station, or incinerator	Varies depending on project scope

[1] Hazardous Waste
[2] Universal Waste
Source: CMP December 2020s.

Wood materials associated with clearing would be sold as marketable timber, chipped for biomass facilities, manufactured into erosion control mulch (i.e., stumps) and/or chipped and spread within the Project ROW in accordance with Maine Slash Law (12 M.R.S. §§ 9331 et. seq.). The applicant does not anticipate these materials would be shipped to solid waste landfills. Construction wastes that would be recycled include metals, wooden cable spools, and some plastics. Excess spoils from grading and excavation would be re-used on site, spread, and vegetated within the ROW, or disposed of at an approved location.

Existing wood utility poles would be removed as a result of the Proposed Project. Removed poles would be donated to private entities for reuse or shipped to an approved special waste landfill for disposal; removed poles are not permitted to be disposed of in general solid waste landfills. If surplus treated wood is to be donated, the applicant requires a Pole Transfer Agreement be signed, in which the transferee

agrees to utilize the treated wood as a utility pole or beneficially in accordance with MDEP Regulations Chapter 418 (Beneficial Reuse), as well as in accordance with other applicable federal, state, and local laws. A Safety Data Sheet is provided to pole recipients, and a Consumer Information Sheet is also provided to recipients that describes proper handling procedures for treated wood. The Pole Transfer Agreement also obliges recipients to accept full responsibility for the use and proper disposal of these treated wood items. In this way, the applicant alerts treated wood recipients of management requirements so that this material is utilized in a way that does not adversely affect natural resources.

All other material would be disposed of at appropriate, approved, state licensed disposal facilities or scrap yards. The applicant has identified solid waste management and disposal vendors that would provide services to the applicant during Proposed Project construction. During the MDEP Permit Application review process, the applicant contacted several facilities on its approved facilities list to confirm their capacity and willingness to receive waste streams from the Proposed Project (CMP 2018d). Two respondents, Casella Waste Systems (Juniper Ridge Landfill in Old Town, Maine) and Schnitzer Steel Industries of Auburn and Portland, Maine, confirmed that they are appropriately licensed, have adequate capacity, and are willing to accept the solid waste types and quantities estimated to be generated by the Project in Table 3.15-2.

Hazardous waste and universal wastes are anticipated to be generated from construction, operation, and maintenance activities (see Table 3.15-3). Waste oil, scrap lead-acid batteries, and automotive fluids (e.g., transmission fluid, antifreeze, brake fluid) may be generated from operation and maintenance of construction equipment and operation and maintenance equipment. Scrap lead-acid batteries, mineral oil, and hydraulic fluid would also be generated from transmission line and substation operation and maintenance activities. These waste types are subject to specific waste management regulations. Waste oils would be managed in accordance with MDEP Regulation Chapter 860, *Waste Oil Management Rules*. Scrap batteries would be managed and recycled in accordance with MDEP Regulation Chapter 858, *Universal Waste Rules*. Automotive fluids would be recycled at licensed facilities.

3.15.2.3 Applicant Committed Measures

The applicant would implement policies and procedures for construction and operation and maintenance of the Proposed Project that address potential impacts related to hazardous materials management and hazardous and solid waste generation and management, and impacts related to potential spills or other accidental releases of hazardous materials to the environment. Proposed methods for minimizing hazardous materials and waste impacts include the following:

- Hazardous and solid waste generation for construction and operation of the Proposed Project would be minimized through application of waste minimization and pollution prevention procedures and by reuse and recycling of waste materials where feasible to do so.

- Hazardous materials spills and other releases would be reduced through implementation of spill prevention procedures in SWPPP and SPCC Plans applicable to the Proposed Project including scheduled inspections of oil-containing equipment, maintenance of secondary containment systems for spill control and management, and maintenance of designated storage and management areas for hazardous materials.

3.16 Cumulative Impact

The USACE evaluated cumulative impacts in its EA, and the MDEP evaluated cumulative impacts in regard to scenic and aesthetic resources in its Order. These analyses are summarized below. In addition,

DOE considered the reasonably foreseeable environmental trends and planned actions in the Proposed Project area (40 CFR 1502.15) and has incorporated those factors into its analysis.

3.16.1 USACE Consideration of Cumulative Impacts

USACE analyzed potential cumulative impacts of the Proposed Project in Section 9 of its EA. The analysis was conducted at a watershed scale for the following river watersheds: Upper Kennebec, Dead, St. George-Sheepscot, Presumpscot, Lower Kennebec, and Lower Androscoggin. USACE explains, "Evaluating the geographic scope of cumulative impacts at a watershed scale considers the broader potential of any action taken and the potential of the cumulative impacts on that watershed." (USACE 2020a: Section 9.2, page 141) USACE describes the web search it conducted for both federal and non-federal past, present, or reasonably foreseeable future actions related to energy, transportation projects, municipal projects, and other projects, that may contribute to cumulative impacts to the affected environment within the geographic scope of the NECEC. Also, USACE reviewed Maine Department of Transportation's list of "Projects Under Construction," and notes that it regularly coordinates with the Maine DEP on known or anticipated work in the region.

USACE found "[w]hen considering the overall impacts that will result from the proposed activity in relation to the overall impacts from past, present, and reasonably foreseeable future activities, the incremental contribution of the proposed activity to cumulative impacts in the area described in section 9.2 are not considered to be significant. Compensatory mitigation will be required and has been proposed to offset the impacts to eliminate or minimize the proposed activity's incremental contribution to cumulative effects within the geographic area described…." (USACE 2020a: Section 9.8, page 148) USACE also "determined that the cumulative impact of the past, present, and future federal and non-federal impacts plus the impacts associated with the NECEC Project, do not constitute an unacceptable loss of resource functions and values" (USACE 2020a: Section 9.6, page 148).

3.16.2 Maine DEP Consideration of Cumulative Impacts

MDEP considered potential scenic and aesthetic cumulative impacts of the Proposed Project. MDEP considered the frequency with which an observer might see the Proposed Project from nearby areas, which is influenced by the distance and travel time between viewpoints. MDEP found "that even if an individual engages in multiple activities that included viewing the project from a scenic resource these views would be sufficiently distinct, separated by time, distance, and differences between the different activities that the cumulative effects of the project will not unreasonably interfere with existing scenic or aesthetic uses" (MDEP 2020: Page 54).

MDEP concluded that, "The cumulative impact of the project and other structures in its vicinity will also be not unreasonable. Pre-existing scenic impacts from land use activities in the Segment 1 area are almost entirely the result of commercial forestry. The cumulative impact of the project and these forestry activities...is not unreasonable. Outside of the Segment 1 area, the co-location of the project in an existing transmission line corridor will minimize its scenic impacts, and the cumulative impact of the pre-existing infrastructure and the project is likewise not unreasonable" (MDEP 2020: Page 54).

Chapter 4
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Appendix A
Geology and Soils

Appendix available in separate PDF document

Appendix B
Vegetation

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Appendix C
Water Resources and Quality

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Appendix D
Land Use and Recreation

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Appendix E
Visual Resources

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Appendix F
Environmental Justice

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Appendix G
Historic and Cultural Resources

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Appendix H
Noise

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Appendix I
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Appendix J
Human Health and Safety

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Appendix K
Public Involvement

Appendix available in separate PDF document