9.0 RESOURCE IMPACT SUMMARY

CMW prioritized avoidance and minimization of impacts to protected resources during the design phase of the Project. The following sections summarize unavoidable impacts associated with construction and operations of the Project.

Of the 75 wetlands identified within project survey areas, only portions of 12 wetlands will be subject to permanent impacts totaling only 3,039 square feet of the total 33.4 acres of land disturbed for construction of the Project. More than half of these permanent impacts are the result of required improvements to Ludden Lane which were unavoidable due to the location of the existing road through wetlands. An additional 4,286 square feet of wetlands will be temporarily altered by use of timber mats placed over wetlands to support construction or where temporary vegetation clearing is necessary for construction activities. An additional 2,258 square feet of palustrine forested (PFO) wetlands will be converted to palustrine scrub-shrub (PSS) wetlands for maintenance of the roadside transmission right-of-way during operations. A summary of these unavoidable impacts can be found in Table 9-1.

In addition, although the one PSVP along the ridgeline has not been confirmed as significant by the Maine DIFW, CMW has designed the Project to avoid and minimize impacts to this resource to the extent practicable (see NRPA-21 in Section 11). CMW will maintain a minimum 100-foot setback from the spring high water line of the PSVP pool and will retain a minimum 75 percent of the adjacent critical terrestrial habitat as undisturbed forest lands, meeting Maine DEP permit-by-rule (Chapter 305) standards for significant wildlife habitats.

9.1 Wetlands and Waterbodies

Results of the wetlands and waterbodies impact assessment are presented in Tables 9-1, 9-2, and 9-3 and are summarized by project segment in the following sections.

Existing Access Roads: Eleven wetlands located adjacent to Ludden Lane or along the existing access road route will be impacted by the Project. Portions of five PFO wetlands (totaling 199 square feet); one PSS (totaling one square foot); and three palustrine emergent (PEM) wetlands (totaling 1536 square feet) will be subject to permanent fills associated with the access roads. Six of these PFO wetlands will have areas that will be permanently converted to PSS as the result of operations of the electric transmission line that will run parallel to the access road. Portions of two permanently impacted wetlands are classified as Maine WSS (Table 9-3). One of these wetlands (AW5) is a WSS due to being located within 25 feet of a NRPA regulated stream (AS9 and AS6) and the second (AW12) is a WSS due to being located within the FEMA mapped 100-year floodplain. Total permanent impacts to wetland AW5 is 32 square feet and the permanent impacts to AW12 is one square foot (see NRPA plans NRPA-05 and NRPA-08 in Section 11).

Widening of Ludden Lane from its existing 14 to 18 feet width to its construction-phase width of 16 to 20 feet will require replacements of several existing culverts and bridges along the road. Many of these existing culverts are in poor condition and are not functioning properly to manage stormwater. Of the 11 stream crossings associated with the Project, ten are improvements to existing stream crossings along

Table 9-1 Canton Mountain Wind Project Wetlands Alteration Summary

Wetlands/ Project Segment	Permanent Wetlands Impacts[1] (Square Feet = ft^2)				Temporary Wetlands Impacts[3] (ft^2)				Total Temporary and Permanent Impacts (ft^2)	Conversion PFO to PSS[4] (ft^2)
	PFO[2]	PSS[2]	PEM[2]	Total Perm.	PFO	PSS	PEM	Total Temp.		
Access Road										
AW5-1	40			40				0	40	33
AW8	18			18				0	18	150
AW5-2	32			32				0	32	146 + 47
AW5-3	96 + 8			104				0	104	224
AW12		1		1				0	1	
AW25	5			5				0	5	1038
AW27			1120	1120			1240	1240	2360	
AW27-2			140	140			308+63 +40	411	551	
AW30				0		77		77	77	
AW32			276	276			235	235	511	
AW36				0				0	0	120
Total	199	1	1536	1736	0	77	1886	1963	3699	1758
Ridgeline										
RW77	1303			1303				0	1303	500
Total	1303	0	0	1303	0	0	0	0	1303	500
Transmission Line										
TW23				0			313	313	313	
TW20				0			61	61	61	
TW16				0	215			215	215	
TW12-1				0			135	135	135	
TW12-2				0	1296			1296	1296	
TW10				0			303	303	303	
Total	0	0	0	0	1511	0	812	2323	2323	0
Project Totals	**1502**	**1**	**1536**	**3039**	**1511**	**77**	**2698**	**4286**	**7325**	**2258**

1. Permanent impacts are those associated with fill in wetlands that will not be removed following construction.
2. Dominant Cowardin wetland types impacted by the Project: Cowardin et al. 1979.
3. Temporary impacts are those associated with temporary fills in wetlands or vegetation removal required to accommodate the construction phase of the Project. Temporary impacts include placement of timber mats in wetlands, which will be removed following construction. These wetlands will be restored to pre-construction topographic and vegetated conditions following construction.
4. Permanent conversion of forested wetlands to scrub-shrub wetlands (PFO to PSS) are associated with existing forested wetlands located along the proposed transmission line right-of-way that will be maintained as scrub-shrub or emergent wetlands following construction.

Table 9-2 Canton Mountain Wind Project Waterbody Impact Summary

Waterbody/ Project Segment	Crossing[1] Type	Maine DEP[2] River, Stream or Brook	Permanent [3]			
			Perennial[4]		Intermittent[5]	
			linear feet	square ft.	linear feet	square ft.
Access Road						
AS9	replace existing 18-inch CMP culvert	Yes			24	72
AS6-1	replace existing timber/steel bridge	Yes	24	453		
AS6-2	replace existing timber/steel bridge	Yes	24	545		
AS19-1	replace existing 18-inch CMP culvert	Yes			24	96
AS19-2	replace existing 24-inch HDPE culvert	Yes			51	204
AS29-1	replace existing 36-inch CMP	Yes	24	336		
AS35	replace existing 12-inch CMP culvert	Yes			25	50
AS29-2	replace existing timber/steel bridge	Yes	24	336		
AS48	replace existing 30-inch CMP	Yes			27	108
AS58	replace existing 24-inch CMP	Yes	24	72		
AS49	new intermittent stream crossing	Yes			75	375
Total			120	1,406	226	905

1. Ten of the 11 proposed stream crossings are upgrades to existing culverts or bridges. CMP is an acronym for corrugated metal pipe and HDPE is an acronym for high-density polyethylene; both are types of culvert. Site specific crossing plans in Section 11 of this application show proposed crossing methods and details.
2. Waterbody meets the NRPA's definition for a river, stream, or brook and, therefore, the resource is regulated by the Maine DEP. Waterbodies regulated by Maine DEP are also regulated by the USACE.
3. Permanent impacts are those associated with permanent alterations to streams associated with construction of the access road and associated culvert replacements. In locations where a bridge or concrete box culvert is proposed permanent impacts would include permanent shading of the stream segment crossed by the bridge or culvert with no in-stream work (see NRPA plans in Section 11).
4. Perennial streams flow more than 6 month of the year and likely flow year round.
5. Intermittent streams flow more than 3 months but less than 6 months of the year.

Ludden Lane and the existing logging road, and one is a new crossing. All of the proposed crossings will be performed in compliance with Maine DEP's permit-by-rule standards. Existing corrugated metal culverts will be replaced with new HDPE culverts that will be extended in length to accommodate the maximum construction width of 20 feet. Permanent stream impacts are those associated with lengthening replaced culverts to accommodate the new road width. In locations where bridges will be replaced or for the new stream crossing (AS49), new arch culverts/bridges will be installed working from existing portions of Ludden Lane avoiding in-stream work. Permanent impacts are those associated with shading the stream segment and associated banks due to the newly installed culvert or bridge.

New Access Road to Ridgeline: One existing intermittent stream (AS49) will be crossed with an open-bottom culvert in accordance with Maine Permit-By-Rule standards. No wetlands will be impacted by this portion of the Project.

Ridgeline: Only one PFO wetland (RW77) located along the ridgeline portion of the Project will be permanently impacted for a total of 1,303 square feet; 500 square feet of this PFO will be converted to PSS. Due to the orientation of this wetland when compared to turbine site 1, its crossing was considered unavoidable. CMW did minimize impacts to this crossing to the extent practicable by designing the road crossing at the narrowest part of the wetland. No streams will be impacted in association with the ridgeline part of the Project.

Table 9-3. Impacts to Wetlands of Special Significance

Wetlands/ Project Segment	Permanent WSS Impacts[1] (Square Feet = ft^2)				Temporary WSS Impacts[3] or Conversion of Habitat(ft^2)				Adjacent Stream/FP[4]	NRPA Plan Reference
	PFO[2]	PSS[2]	PEM[2]	Total	PFO	PSS	PEM	Total		
Access Road										
AW5-2 (east)	32				146				AS9	NRPA-05
AW5-2 (west)					47				AS6	NRPA-05
AW12		1							FP	NRPA-08
Project Totals	**32**	**1**	**0**	**0**	**193**	**0**	**0**	**0**		

1. Permanent impacts are those associated with fill in wetlands that will not be removed following construction.
2. Dominant Cowardin wetland types impacted by the Project: Cowardin et al. 1979.
3. Temporary impacts are those associated with temporary fills in wetlands or vegetation removal required to accommodate the construction phase of the Project. Temporary impacts include placement of timber mats in wetlands, which will be removed following construction. These wetlands will be restored to pre-construction topographic and vegetated conditions following construction. Conversion of wetlands habitat from PFO to PSS is required for maintenance of the aboveground electric transmission lines.
4. Portions of the wetlands are classified as Maine wetlands of special significance (WSS) due to either being located within 25 feet of a NRPA-regulated river, stream or brook or because they are located within the Federal Emergency Management Agency (FEMA)-mapped 100 year floodplain.

Transmission Line: There will be no permanent wetland impacts associated with the transmission line portion of the Project. A total of 2,323 square feet of temporary wetlands impacts associated with matted wetlands crossings will be required for construction of the proposed transmission line. The only stream located within in the transmission right-of-way (TS18) will not be crossed during construction. Construction equipment will work up to the stream and then move around using access along the transmission corridor without crossing the stream to complete installation of the transmission line.

9.2 Vernal Pool Impacts

One vernal pool (plan ID 9PSVP field ID CR_SVP_BA506) located along the ridgeline portion of the Project met the Maine DEP's biological criteria for classification as a PSVP, and one vernal pool located

within 250 feet of the proposed transmission line portion of the Project was previously confirmed by Maine DIFW as a significant vernal pool.

Although 9PSVP may not be a natural feature in the landscape because it appears to be at least partially associated with historic quarrying, CMW assumed this resource would be classified as a SVP during design of the Project and has maintained both a minimum 100-foot setback from the spring high water line and a minimum of 75 percent of the adjacent critical terrestrial habitat intact and unfragmented following construction of the Project. Therefore, the proposed Project-related activities within 250 feet of this resource area are expected to meet the Maine DEP's Chapter 305, Section 19, Permit-by-Rule Standards in the event that this resource is determined by Maine DIFW to be a SVP.

In addition, one SVP is located outside of the proposed Project work limits and east of the proposed transmission line that will be constructed within the same right-of-way as the Saddleback Ridge Wind transmission line (see Attachment 6-1, Appendix G, Map 1). Data forms for this SVP were submitted to the Maine DIFW as part of the regulatory permitting for the Saddleback Ridge Wind project in 2010. As a result, the Maine DIFW confirmed that this SVP meets the NRPA significance criteria. It was also determined that the Saddleback Ridge transmission line could be built maintaining a minimum 100 foot separation distance between the transmission line right-of-way and the spring high water line of the SVP and that a minimum of 75 percent of the adjacent critical terrestrial habitat would remain intact following construction. Therefore, the transmission line would be built in compliance with Maine DEP's Permit-by-Rule standards (Chapter 305), Section 19, for *Activities in, on or over significant vernal pool habitat.* Because the CMW transmission line would be built entirely within the previously approved transmission line right-of-way, and no additional alteration of habitat is proposed, the CMW project is also expected to meet the Maine DEP's Chapter 305, Section 19, Permit-by-Rule Standards.

9.3 Project Resource Impact Summary

Table 9-4 provides an overall summary of unavoidable temporary and permanent impacts associated with construction and operations of the Project.

Table 9-4 Canton Mountain Wind Project Overall Resource Impact Summary

Project Segment	Permanent Wetland Fill (square feet)	Temporary Wetlands Alterations (square feet)	Permanent Conversion PFO to PSS (square feet)	Stream Crossings (linear feet)	Impacts to PVP (number)
Access Road	1,736	1,963	1,758	346	0
Ridgeline	1,303	0	500	0	0
Transmission Line	0	2,323	0	0	0
Totals	**3,039**	**4,286**	**2,258**	**346**	**0**

9.4 Impact Assessment, Wetlands Functions and Values, and Compensation

CMW prioritized avoidance and minimization of impacts to protected natural resources throughout the planning and design phases of the Project. As a result, only portions of 12 of the 75 wetlands surveyed in the project area will be permanently impacted (totaling 3,038 square feet of permanent impacts). As described in Section 7, CMW also went through an extensive iterative process to avoid and minimize

impacts to protected natural resources. This section summarizes the unavoidable resource impacts associated with construction and operations of the Project.

Maine's NRPA, Chapter 310, *Wetlands and Waterbodies Protection Rules*, requires that proposed projects not have unreasonable impacts on protected resources that result in lost functions and their associated values to society and the environment. The USACE's *Highway Methodology Workbook* defines wetlands functions and values as follows:

Functions: Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society. Functions result from both living and non-living components of a specific wetland. These include all processes necessary for the self-maintenance of the wetland ecosystem such as primary production and nutrient cycling, among others. Therefore, functions relate to the ecological significance of wetland properties without regard to subjective human values.

Values: Values are benefits to society that derive from one or more functions and the physical characteristics associated with a wetland. The value of a particular wetland function, or combination thereof, is based on human judgment of the worth, merit, quality, or importance attributed to those functions.

There are eight wetlands functions and five values potentially applicable to the Project. They are as follows:

Wetland Functions:

1. Groundwater Recharge/Discharge

   This function describes a wetland's ability to act as a recharge site, such as its potential to provide water to an aquifer or its ability to act as an input site for groundwater to discharge to the surface (i.e., springs and seeps).

2. Floodflow Alteration and Desynchronization

   This function considers a wetland's ability to store and slowly release floodwaters over an extended period of time following storm events.

3. Fish and Shellfish Habitat

   This function considers the potential for a wetland and intermittent or perennial waterbodies associated with a wetland to provide habitat for fish and shellfish.

4. Sediment/Toxicant Retention

   This function describes a wetland's effectiveness at trapping and retaining potentially harmful sediment, toxicants, and pathogens.

5. Nutrient Removal

   This function considers a wetland's ability to remove nutrients such as phosphorus and nitrogen from runoff and prevent the nutrients from reaching surface and groundwater by retaining and transforming them.

6. Production Export

   This function measures a wetland's effectiveness at producing foods for living creatures or other usable products such as timber for humans.

7. Sediment/Shoreline Stabilization

   This function considers a wetland's potential for stabilizing and protecting sediments and shorelines from erosion.

8. Wildlife Habitat

   This function relates to a wetland's ability to provide habitat for various species of wildlife generally associated with wetlands and adjacent uplands. This includes habitat for both non-migratory and migratory wildlife species.

Wetland Values:

1. Recreation (Consumptive and Non-Consumptive)

   This value describes a wetland's ability to provide opportunities for consumptive activities such as hunting and fishing, or non-consumptive activities such as boating, bird watching, and swimming.

2. Educational/Scientific Value

   This value considers a wetland's potential for providing teaching and learning possibilities and opportunities for scientific work and research.

3. Uniqueness/Heritage

   This value relates to a wetland's potential for providing special values such as possessing historically significant sites and unique natural areas.

4. Visual Quality/Aesthetics

   This value considers the aesthetic and visual quality associated with a wetland.

5. Threatened or Endangered Species Habitat

   This value pertains to a wetland's potential for harboring rare, threatened, and endangered species and their habitat.

The applicability of these wetlands functions and values are discussed in the following sections.

9.4.1 Permanent Resource Impacts

Through an exhaustive impact avoidance and minimization process (see Section 8), CMW was able to design 8 wind turbine foundations, 5.1 miles of access roads, a 3,500-square-foot O&M building with 7,500 square foot parking lot, and 2.7 miles of electric transmission lines completely avoiding direct impacts to 63 of 75 wetlands delineated in the project area. Eleven of the 12 wetlands impacted are located along the Ludden Lane and are considered unavoidable impacts due to the configuration of wetlands adjacent to the existing road bed and, in many cases, wetlands created due to the construction of the existing road. The one wetland crossing along the ridgeline (RW77) was considered unavoidable due to the configuration of topographic conditions along the ridgeline; impacts to this wetland were minimized by designing the crossing at the wetlands narrowest location.

Of the 22 waterbodies delineated in the project area, only one new crossing of an intermittent stream (AS49) is required to build and operate the Project. This stream crossing will be built in accordance with NRPA permit-by-rule standards using an open bottom culvert that will allow existing stream bed conditions to remain intact. Ten additional existing culvert or bridge crossings along Ludden Lane will be upgraded (culverts and bridges replaced) as the result of the Project and will also be performed in accordance with NRPA permit-by-rule standards.

Two vernal pools were identified in the Project vicinity that meet both the physical and biological criteria for classification as a significant vernal pool in accordance with Maine's NRPA. CMW has assumed that the area within 250 feet of the spring high water line of both of these vernal pools is critical terrestrial habitat for vernal pool breeding amphibians. A minimum 100-foot separation distance will be maintained between the spring high water line of these pools and the proposed construction work limits. The Project has also been designed to ensure a minimum of 75 percent of the adjacent critical terrestrial habitat (area within 250 feet of the spring high water line of the pools) will remain intact following construction in compliance with NRPA Chapter 305, Section 19, permit-by-rule standards.

9.4.2 Temporary Resource Impacts

Temporary wetland impacts are summarized in Table 9-1. All of the temporary wetland impacts associated with the Project involve placement of timber mats over wetlands to support the construction equipment necessary to build the Project or the temporary clearing of vegetation during the construction phase of the Project. Although the functions of these wetlands will be altered during construction of the Project, these wetlands will be restored to pre-construction vegetated and topographic conditions following construction.

9.4.3 Compensation

In accordance with the NRPA's Chapter 310, *Wetland and Waterbody Protection Rules*, 5(C)(6)(a)(ii), the Project is anticipated to be exempt from state requirements for compensation because permanent impacts to freshwater wetlands would be less than 15,000 square feet. In addition, CMW has demonstrated that impacts to protected resources have been avoided and minimized to the greatest extent practicable, resulting in a project that represents the LEDPA.