CENTRAL MAINE POWER COMPANY
Site Location of Development Act // Natural Resources Protection Act
Upgrade of Transmission Corridor – 78 Municipalities

Excerpts from the Department's Record

- Project Description
- Applicant's Visual Impact Assessment – methodology and assessment of Segment 27
- Construction Plan
- Application information on MPRP Stormwater Management Plan – Basic Standards
- Division of Watershed Management (DWM) comments, dated January 14, 2010
- MPRP revisions in response to DWM comments, dated January 29, 2010
- Memo to Department staff from licensee regarding request for multiple third party inspection candidates, dated November 13, 2009
- Memo chain, dated January 21, 2020, regarding Maine Department of Inland Fisheries & Wildlife's comments on avian marker balls placement at specific Inland Waterfowl and Wading Bird Habitats

Please refer to pages 93-105 of the Department Order for the Amended Vegetation Management Plan, dated March 31, 2010.

1.0 DEVELOPMENT DESCRIPTION

1.1 INTRODUCTION

The Maine Power Reliability Program (MPRP) is a Central Maine Power Company (CMP) project to upgrade Maine's bulk power transmission system. MPRP is a proposal to build, rebuild, or re-rate transmission lines in approximately 360 miles of transmission line corridor. In addition, MPRP includes building, expanding, or otherwise upgrading a total of 13 substations. The location of the transmission line corridors and substations is generally shown in Exhibit 1-1 of this Section. In addition, four existing substations will be decommissioned.

The vast majority of Maine's bulk power transmission system was placed in-service in the early 1970s and is now reaching the limits of its ability to meet the growing electrical demand of Maine customers. Since the last major transmission infrastructure was completed nearly 40 years ago, the patterns of both available generation and customer load have shifted significantly. For example, the population has become more concentrated in the southern part of the state, while the generation needed to serve that load, especially with the closure of Maine Yankee, is now more distant, and dispersed. Even at today's load levels, the bulk power system fails to meet the standards to which bulk power transmissions systems must now be planned. As electric load increases in the future, these deficiencies will be exacerbated.

In addition to increased electricity use and changing generation patterns, in recent years there has been an increased focus on and strengthening of the reliability and security standards, including those relating to transmission planning, mandated by law and administered by the North American Electric Reliability Corporation (NERC), the Northeast Power Coordinating Council, Inc. (NPCC) and ISO New England (ISO-NE).[1]

[1] In 2005, in response to the August 2003 blackout and concerns for reliability, Congress passed the Energy Policy Act of 2005 ("EPAct"), which, among other things, mandates electric reliability standards. Energy Policy Act of 2005, Title XII, Subtitle A ("Electric Modernization Act of 2005"), § 1211(a) ("Electric Reliability Standards"), Pub. L. No. 109-58, 119 Stat. 594. EPAct amended Section 215 of the Federal Power Act (FPA) (16 U.S.C. § 824o) to direct the Federal Energy Regulatory Commission (FERC) to establish one national Electric Reliability Organization (ERO).

In 2006, FERC selected NERC as the ERO responsible for developing and enforcing reliability standards for the bulk-power system throughout the United States, subject to FERC approval under FPA § 215. *See North American Electric Reliability Corp.*, 116 FERC 61,062, *order on reh'g & compliance*, 117 FERC 61,126 (2006), *order on*

1.2 NEEDS ASSESSMENT

In order to evaluate the ability of the system to continue to serve Maine customers reliably and to meet required reliability and security standards, CMP, Bangor Hydro Electric (BHE), Maine Public Service Co. (MPS), and the Northern Maine Independent System Administrator (NMISA), under the direction and supervision of ISO-NE, undertook and completed a comprehensive forward looking needs assessment and transmission planning study (Needs Assessment) of Maine's bulk power system currently supporting the CMP and BHE service territories.

Using mandatory and enforceable reliability standards, the Maine grid was evaluated at forecast load levels for the year 2017. Planning standards require that the system be operated such that reasonable contingencies, including the unexpected loss of generation resources or transmission lines, can occur without causing overloads, low voltages, instability, cascading outages, or loss of customer load. The Needs Assessment identified significant reliability needs in Maine such that the bulk power system will, no later than 2012,[2] fail to meet the relevant planning standards, designed to ensure adequate and safe electric service, unless prompt remedial action is taken.

After identifying significant reliability needs, the MPRP evaluated transmission and non-transmission solutions to ensure reliability of the grid. In this regard, two studies were performed: a Transmission Alternatives Assessment to develop transmission solution alternatives and select a

compliance, 118 FERC 61,030 (2007); *see also* Rules Concerning Certification of the Electric Reliability Organization; Procedures for the Establishment, Approval and Enforcement of Electric Reliability Standards, Order 672, 71 Fed. Reg. 8662 (Feb. 17, 2006), *order on reh'g*., Order No. 672-A.

Reliability standards proposed by NERC and adopted by FERC are mandatory and enforceable with full force of law. By final Order in March 2007, effective on June 18, 2007, FERC amended its regulations to incorporate 83 mandatory reliability standards. *See Mandatory Reliability Standards for the Bulk-Power System*, "Final Rule," Order No. 693 (March 16, 2007), 72 Fed. Reg. 16,416 (April 4. 2007), *order on reh'g*., Order No. 693-A, 120 FERC 61, 053 (2007); *see also* 18 C.F.R. § 40.2. Part 40 of the regulations now applies to all users, owners and operators of the Bulk-Power System within the United States (other than Alaska or Hawaii), and requires each applicable user, owner or operator of the Bulk-Power System to comply. *See id.* Utilities or bulk-power system users, including CMP, who do not comply, face fines up to $1 million per day. *See* 16 U.S.C. § 825o-1(b); NERC Sanction Guidelines §§ 3.20, 3.21.

[2] The initial analyses used 2012 as a reference point because, as a practical matter, the project could not be completed until that year. Those analyses showed, however, that by 2012 there were already substantial needs, and a more recent analysis performed in the course of the proceedings at the MPUC shows that the needs identified in the initial analyses substantially already exist. In other words, the system now in place would not be the system required by the relevant planning standards even for today's loads.

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preferred alternative; and a Non-Transmission Alternatives (NTAs) Assessment and Economic Evaluation to identify and evaluate other potential solutions.

In summary, the Needs Assessment analyzed 18 different operating scenarios, and approximately 275 different contingencies, to identify areas that needed to be addressed to meet applicable reliability standards. The Transmission Alternatives Assessment then evaluated a variety of transmission options within the affected service territory to identify the optimal response from a transmission solution perspective. Finally, the NTA Report evaluated the opportunities for substituting non-transmission alternatives for the transmission options.[3]

With the exception of one area identified in the studies (the South Portland Loop), it was determined that construction of the transmission solutions must be pursued in order to ensure continued system reliability and compliance with the mandatory reliability planning standards of NERC, NPCC and ISO-NE. The transmission solutions are more cost-effective to Maine customers than the NTAs and will provide greater certainty and enhanced system performance.

CMP has petitioned the Maine Public Utilities Commission (MPUC) pursuant to 35-A M.R.S.A. § 3132(2) for a Certificate of Public Convenience and Necessity (CPCN) for the MPRP. This process, which is ongoing, requires the MPUC to determine whether there is a public need for the project after consideration of multiple factors, including reliability, safety, and economics. 35-A M.R.S.A. § 3132(6); 65-407 CMR Ch. 330, § 9(B). Among the factors being considered is electric and magnetic fields (EMF). An integral part of the MPUC review is whether the transmission elements proposed as part of MPRP are appropriate solutions to addressing the reliability needs of the transmission system, or whether one or more non-transmission alternatives should be substituted for one or more proposed transmission elements.

Moreover, CMP has analyzed multiple alternatives to the proposed location and character of the project to lessen its environmental impact and reduce any potential risks to the public health and safety, without unreasonably increasing cost. See 38 M.R.S.A. § 487-A(4). For more

[3] Although not directly relevant to the Site Law and NRPA approval criteria, the NTA Report is discussed here for background purposes. The NTA Report and the issue of the NTAs are being thoroughly examined in the pending MPUC Certificate of Public Convenience and Necessity (CPCN) proceeding.

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information on these alternatives, please see Attachment 2.0 of the NRPA application, which is incorporated here by reference.

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1.3 TRANSMISSION LINE SOLUTIONS

The transmission line solutions take three basic forms: building new lines, rebuilding existing lines, and re-rating existing lines. The MPRP will include a total of approximately 540 miles of newly built, rebuilt, or re-rated transmission lines constructed within approximately 360 miles of transmission line corridor.

New transmission lines will be built in locations where the existing transmission line infrastructure was determined to be inadequate to meet the reliability requirements identified in the Needs Assessment. Approximately 185 miles of new 345,000 volt (345 kV) and 119 miles of new 115,000 volt (115 kV) transmission line are proposed to be built as part of MPRP.

Rebuilding of existing lines is generally required for one or more reasons including the need to: (i) replace structures that are approaching the end of their service life, (ii) increase a line's capacity, (iii) reconfigure to create additional space within an existing corridor, or (iv) limit electrical outages. In some cases, the rebuild will consist of relocating a transmission line section by building a new version of the line at a different location within the same corridor. In doing so, adequate space is then created to fit an additional transmission line in the same corridor. The relocated line may be rebuilt in a different configuration: for example, an H-frame double pole structure may be replaced with a single pole structure. All rebuilds will be operated at the same voltage as the original lines. Rebuilding or reconstruction of existing transmission lines within the same right-of-way is exempt from the Site Location of Development Act (Site Law) under 38 M.R.S.A. § 488.

In order to accomplish maximum utilization of the transmission line corridor, the MPRP has identified approximately 195 miles of lines to be rebuilt. The majority (approximately 174 miles) of the rebuilds are 115 kV lines. Additionally, there are three areas (totaling 17 miles) where 345 kV lines will also have to be rebuilt. In two of these situations currently existing double circuited 345 kV lines (*i.e.*, two transmission line sections located on a single structure) need to be separated for reliability reasons because the loss of a single structure could result in the loss of two high voltage circuits. Finally, there are also almost three miles of 34.5 kV transmission lines that will be rebuilt as part of the MPRP.

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The MPRP planned rebuilds involve moving existing lines to a different location within the transmission line corridor. Once the rebuilds are in-service, the original transmission lines will be removed. A significant consideration in rebuilding transmission lines is the amount of time that a line is taken out of service. For example, rebuilding a new line in the same location or in close proximity to an existing line would mean, for worker safety reasons, having to take down the existing line before building the new line. This may lead to an extended period of time during which this part of the grid would be with limited or no power, that is, there would be a potential for service outage. For obvious reasons, the number and duration of outages needs to be minimized.

Approximately 40 miles of transmission line (36 miles of 115 kV and 4 miles of 345 kV) are being re-rated. Re-rating involves potentially modifying a transmission line so that it can operate at a higher electrical capacity. This can be accomplished by replacing the existing conductor with a larger one (higher conductor capacity) and/or by increasing its operating temperature. Adding a larger conductor generally requires stronger transmission structures, resulting in a rebuild vs. a re-rate. Increasing the operating temperature in turn increases the amount of sag in the line. In order to guarantee that a re-rated line will continue to meet clearance standards, the re-rated line can either be re-tensioned (pulled tighter), and/or the height of the line can be increased through the use of taller structures. A re-rated line may require such modifications through part or all of its length. Re-rating a transmission line has even less potential to cause environmental impact than a rebuild of a line, and thus is also exempt from the Site Law under 38 M.R.S.A. § 488.

The new and rebuilt transmission lines will result in new configurations of lines within the CMP transmission line corridors. Figures depicting the existing and the proposed new configurations within the transmission line corridors can be found in Appendix 1, Transmission Line Configuration Cross-Sections.

A guiding principle in the design of the MPRP transmission line upgrades has been to utilize the existing transmission line corridors to the maximum extent possible. As **Table 1-1** illustrates, the vast majority (98 percent) of the transmission line upgrades are located within, or immediately adjacent to, existing corridors. This co-location has the multiple benefits of minimizing

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environmental impacts, minimizing landowner and societal impacts, and being the most efficient to construct and maintain.

Table 1-1: Transmission Line Utilization

	Percent of MPRP Transmission Line Development
Entirely within Existing Corridor	82±
Within existing Corridor and adjacent land	16±
Within new (Greenfield) Corridor	2±
TOTAL	**100**

The transmission line infrastructure improvements contained in this Site Law are presented in Table 1-2.

1.4 SUBSTATIONS

Substations are a necessary component of all electric transmission systems. Substations function as bulk power distribution centers with equipment and transmission lines interconnected, designed, and configured to serve as the backbone of the electrical grid. Substations also contain the protective equipment required to ensure the transmission of electrical energy is safe and reliable. The substations of the MPRP are a combination of switching and voltage step-down equipment arranged to interconnect the various transmission lines and reduce transmission voltage from 345 kV to 115 kV and/or from 115 kV to 34.5 kV.

The upgrade of CMP's bulk power system will involve 13 different substations, including the development of five new substations. Seven existing substations will be expanded to accommodate new electrical equipment, and another existing substation will receive electrical equipment upgrades for which no expansion is required.

As with the transmission line upgrades, every effort has been made to avoid or minimize environmental and real estate impacts due to the substation upgrades. For existing substations,

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additional required equipment has been configured to avoid the need for substation yard expansion or, if yard expansion is required, the area of the expansion has been minimized to the maximum extent practicable. As noted above, there are several locations where entirely new substations are needed to supplement the transmission line upgrades. Each of these locations has been chosen to meet the electrical need while at the same time minimizing the environmental impacts through site selection and equipment configuration.

The specific substation infrastructure improvements contained in the Site Law are presented in Table 1-3.

Table 1-2: Transmission Line Infrastructure

CMP Transmission Line Section #	Voltage	MPRP Segment(s) #	Description	Length (miles)	Municipality(ies)
MPRP – NEW TRANSMISSION SECTIONS					
243A (formerly 252 and 253)	115 kV	39	Single circuit 115 kV on existing ROW. Livermore Falls SS to Rumford IP SS	20.4	Canton, Dixfield, Livermore Falls, Jay, Peru, Rumford
244	115 kV	35	Single circuit 115 kV on existing ROW. Coopers Mills Road SS to Highland SS	23.0	Jefferson, Waldoboro, Warren, Washington, Windsor
251	115 kV	14	Single circuit 115 kV on existing ROW. Larrabee Road SS to Livermore Falls SS	24.1	Greene, Leeds, Lewiston, Livermore Falls
254	345 kV	1, 4, 6	Single circuit 115 kV on existing ROW. Built to 345 kV standards. Orrington SS to Coopers Mills Road SS	51.4	Appleton, Brooks, Bucksport, Frankfort, Hibberts Gore, Liberty, Monroe, Morrill, Orrington, Searsmont, Somerville, Swanville, Waldo, Washington, Windsor, Winterport
266	115 kV	40B	New 115 kV near Belfast SS	0.3	Belfast
3020	345 kV	18, 19	Single circuit 345 kV on existing ROW. Surowiec SS to Raven Farm SS	12.4	Cumberland, North Yarmouth, Pownal, Yarmouth
3021	345 kV	24	Single circuit 345 kV on existing ROW. So. Gorham to Maguire Road SS	21.0	Arundel, Biddeford, Gorham, Kennebunk, Saco, Scarborough
3022	345 kV	27	Single circuit 345 kV on existing ROW. Maguire Road SS to Three Rivers	19.2	Eliot, Kennebunk, North Berwick, South Berwick, Wells

CMP Transmission Line Section #	Voltage	MPRP Segment(s) #	Description	Length (miles)	Municipality(ies)
3023	345 kV	1, 3, 9	Single circuit 345 kV on existing ROW. Orrington SS to Detroit to Albion Road SS	59.0	Benton, Bucksport, Burnham, Clinton, Detroit, Dixmont, Frankfort, Monroe, Orrington, Pittsfield, Plymouth, Troy, Winterport
3024	345 kV	10	Single circuit 345 kV on existing ROW. Albion Road SS to Coopers Mills Road SS	20.8	Albion, Benton, China, Windsor, Winslow
3025	345 kV	17	Single circuit 345 kV on existing ROW. Coopers Mills Road SS to Larrabee Road SS	35.1	Augusta, Chelsea, Farmingdale, Greene, Lewiston, Litchfield, Monmouth, Wales, West Gardiner, Whitefield, Windsor
MPRP –TRANSMISSION SECTIONS TO BE REBUILT (EXEMPT FROM SITE LAW)					
60	115 kV	15	Rebuild Section 60. Coopers Mills Road SS to Bowman St	12.9	Augusta, Chelsea, Farmingdale, Whitefield, Windsor
65, 205	115 kV	2	Separate Bucksport DCT	0.3	Bucksport
66	115 kV	9	Rebuild Section 66. Detroit to divergence with S67	1.8	Detroit, Pittsfield
67	115 kV	9	Rebuild Section 67. Detroit to divergence with S66	1.8	Detroit, Pittsfield
80	115 kV	35	Rebuild Section 80. Coopers Mills Road SS to Highland SS	23.0	Jefferson, Waldoboro, Warren, Washington, Windsor
81	115 kV	16	Double Circuit with Section 377	0.9	Bowdoinham, Woolwich

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CMP Transmission Line Section #	Voltage	MPRP Segment(s) #	Description	Length (miles)	Municipality(ies)
84	115 kV	10A	Rebuild Section 84. Albion Road SS to Winslow	5.0	Benton, Winslow
86	115 kV	40A	Rebuild Section 86. Bucksport to Searsport	9.2	Prospect, Searsport, Stockton Springs
88	115 kV	15	Rebuild Section 88. Coopers Mills Road SS to divergence with S60	5.5	Augusta, Chelsea, Whitefield, Windsor
89	115 kV	39	Rebuild Section 89. Livermore Falls SS to Jct. outside Riley	4.9	Livermore Falls, Jay
166	115 kV	18	Rebuild Section 166. Surowiec SS to divergence with S374	2.6	North Yarmouth, Pownal
167	115 kV	18	Rebuild Section 167. Surowiec SS to divergence with S374	2.6	North Yarmouth, Pownal
175	34.5 kV	24	Rebuild section 175. Louden to divergence with S3020	1.5	Biddeford, Saco
203	115 kV	3	Rebuild Section 203. Detroit to Intersection with Section 388.	24.6	Detroit, Dixmont, Frankfort. Monroe, Plymouth, Troy, Winterport
207A	115 kV	29	Rebuild portion of Section 207A	0.5	Wiscasset
212	115 kV	15	Rebuild Section 212. Monmouth SS to Larrabee Road SS	11.0	Greene, Lewiston, Monmouth, Wales,
229	115 kV	39	Rebuild section 229. Jct. outside Riley to Rumford IP	13.8	Canton, Dixfield, Jay, Peru, Rumford

CMP Transmission Line Section #	Voltage	MPRP Segment(s) #	Description	Length (miles)	Municipality(ies)
238 (formerly 250)	115 kV	24	Rebuild section 250 (now 238). Louden to divergence with S175	1.5	Biddeford, Saco
250	115 kV	27	Rebuild section 250. Quaker Hill to Three Rivers	8.7	Eliot, North Berwick, South Berwick
257 (Formerly 67)	115 kV	10	Relocate portions of Section 67 (now 257) in areas required by location of additional ROW purchase.	7.9	Albion, China
258 (Formerly 84)	115 kV	10	Rebuild Section 84. Albion Road SS to Coopers Mills Road SS	15.4	Albion, Benton, China, Windsor, Winslow
269 (Formerly 212)	115 kV	15	Rebuild Section 212 Bowman St SS to Monmouth SS	11.4	Farmingdale, Litchfield, Monmouth, West Gardiner
375-377	345 kV	16	Separate Kennebec River DCT. Sections 375 and 377 across the Kennebec River.	3.8	Bowdoinham, Woolwich
375-392	345 kV	29	Separate the Maine Yankee SS DCT. Sections 375 and 392 from M.Y. to divergence of S392	5.4	Wiscasset, Woolwich
388	345 kV	1	Relocate Section 388 in vicinity of Penobscot River Crossing	7.2	Bucksport, Frankfort, Orrington, Winterport
MPRP – TRANSMISSION SECTIONS TO BE RE-RATED (EXEMPT FROM SITE LAW)					
61A	115 kV	38B	Re-rate Section 61A. Tap to Hotel Rd	10.6	Auburn, Minot
67A	115 kV	34A	Re-rate section 67A. Heywood to Rice Rips	9.9	Benton, Fairfield, Oakland, Waterville, Winslow

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CMP Transmission Line Section #	Voltage	MPRP Segment(s) #	Description	Length (miles)	Municipality(ies)
83B	115 kV	34B	Re-rate 83B. Tap to Lakewood	4.0	Cornville, Madison
83C	115 kV	34C	Re-rate 83C. Tap to Sappi	3.3	Skowhegan
88	115 kV	35B	Re-rate Section 88. Divergence with S60 to Augusta E. Side	6.1	Augusta, Chelsea
167A	115 kV	30A	Re-rate 167A. Tap to Prides Corner	1.8	Westbrook
378	345 kV	29	Re-rate Section 378. Maine Yankee SS to Mason	3.4	Wiscasset

Table 1-3: Substation Infrastructure

MPRP SUBSTATIONS			
Substation	**Municipality**	**Voltage**	**Expansion Area**
Equipment Upgrade: No Yard Expansion			
Orrington	Orrington	345/115 kV	0
Yard Expansion			
Belfast	Belfast	115/34.5/12 kV	0.18
Highland	Rockland	115/34.5 kV	0.45
Livermore Falls	Livermore Falls	115/34.5/12 kV	2.15
Maguire Road	Kennebunk	345/115 kV	4.78
Maine Yankee	Wiscasset	345 kV	0.9
Spring Street	Westbrook	115 kV	1.07
Surowiec	Pownal	345/115 kV	4.02
New Substation			
Albion Road	Benton	345/115 kV	16.83
Coopers Mills Road	Windsor	345 kV	27.61
Larrabee	Lewiston	345/115 kV	22.73
Monmouth	Monmouth	115/34.5/12 kV	2.21
Raven Farm	Cumberland	345/115 kV	21.95

1.5 NATURAL RESOURCE IMPACTS

At the request of MDEP and ACOE the following Tables 1-4 and 1-5 have been added to summarize the transmission line and substation natural resource impacts that, in accordance with the Natural Resources Protection Act (NRPA) and Section 404 of the Clean Water Act, form the basis of the compensation package for the Site Law.

No compensation is being proposed for any MPRP-related effects to deer wintering areas (DWAs) and temporary access roads that will be in place for less than 18 months for the following reasons:

- There are no DWAs in the vicinity of any of the proposed substation projects;
- DWAs considered to be Significant Wildlife Habitat are those that have been mapped by the Maine Department of Inland Fisheries and Wildlife (MDIF&W), and given a habitat value ranking of "moderate" or "high," as defined by MDIF&W. 38 M.R.S.A. § 480-I(1)(A). Currently, all of the DWAs located within the MPRP transmission line corridor scope are ranked as "indeterminate." In addition, MDIF&W has not adopted, by rulemaking, criteria for designating moderate or high value DWAs other than what is currently set forth in MDIF&W rule 10.02, and none of the indeterminate DWAs meet these criteria. Therefore, no compensation is required.
- Leaving temporary access roads in place for less than 18 months will not result in excessive temporal loss of wetland functions and values. In addition, once removed these areas will be restored to pre-construction conditions or better. Not proposing compensation for temporary access roads of less than 18 months is consistent with MDEP guidance and policy.

Table 1-4: Summary of Transmission Line Impacts Requiring Compensation

Transmission Line Segment	Permanent Fill Impacts to Wetlands (WOSS and Non-WOSS) (Acres)	Temporary (> 18 months) Access Road Impacts to Wetlands (WOSS and Non-WOSS) (Acres)	Temporary (< 18 months) Access Road Impacts to Wetlands (WOSS and Non-WOSS) (Acres)	# of Significant Vernal Pools where > 25 percent is Non-forested within 250ft	Conversion of Forest to Shrub/herbaceous within 250ft of Significant Vernal Pools (Acres)	# of USACE Vernal Pools where > 25 percent is Non-forested within 750ft	Conversion of Forest to Shrub/herbaceous within 250ft of USACE Vernal Pools (Acres)	Conversion of Forest to Shrub/herbaceous in Waterfowl and Wading Bird Habitat (Acres)	Conversion of Forested Wetland to Maintained Early-successional Habitat (Acres) [USACE]
1	0.05	0.00	2.99	8	8.43	2	3.32	10.88	25.07
2	0.00	0.00	0.00	0	0.00	0	0.00	0.00	0.00
3	0.08	0.00	11.31	7	4.01	1	0.49	6.39	36.70
4	0.02	0.00	2.93	2	0.83	0	0.00	8.05	8.80
6	0.05	0.00	10.24	13	7.27	3	1.06	5.71	22.36
9	0.09	0.00	15.26	1	1.06	1	1.28	0.00	92.76
10	0.05	0.00	6.74	9	3.57	0	0.00	1.57	20.64
10A	0.01	0.00	1.49	0	0.00	0	0.00	0.00	0.69
14	0.05	0.00	6.70	9	4.64	0	0.00	2.37	38.66
15	0.07	7.80	3.67	17	10.36	2	0.95	2.52	24.14
15 Alt.	0.01	1.93	0.65	4	15.09	0	0.00	4.33	27.05
16	0.03	0.00	0.56	0	0.00	0	0.00	0.00	0.00
17	0.04	0.00	3.63	5	5.03	3	1.32	0.00	27.80
18	0.01	0.00	1.64	4	2.65	0	0.00	0.00	5.86
19	0.02	0.00	1.43	2	3.45	4	3.76	2.06	11.78
24	0.04	0.00	6.25	2	0.48	1	0.78	1.28	11.01
27	0.06	0.00	7.65	2	1.95	0	0.00	0.71	9.91
29	0.01	0.00	1.30	1	1.39	0	0.00	0.00	0.55
30A	0.00	0.00	0.61	0	0.00	0	0.00	0.00	0.00
34A	0.02	0.00	1.79	0	0.00	0	0.00	0.00	0.00
34B	0.02	0.00	2.18	0	0.00	0	0.00	0.00	0.00
34C	0.01	0.00	0.73	0	0.00	0	0.00	0.00	0.00
35	0.03	0.00	6.79	0	0.00	0	0.00	0.30	2.00
35B	0.02	0.00	2.99	0	0.00	0	0.00	0.00	0.00
38B	0.03	0.00	3.05	0	0.00	0	0.00	0.00	0.00
39	0.02	0.00	3.54	0	0.00	0	0.00	0.00	1.14

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Transmission Line Segment	Permanent Fill Impacts to Wetlands (WOSS and Non-WOSS) (Acres)	Temporary (> 18 months) Access Road Impacts to Wetlands (WOSS and Non-WOSS) (Acres)	Temporary (< 18 months) Access Road Impacts to Wetlands (WOSS and Non-WOSS) (Acres)	# of Significant Vernal Pools where > 25 percent is Non-forested within 250ft	Conversion of Forest to Shrub/herbaceous within 250ft of Significant Vernal Pools (Acres)	# of USACE Vernal Pools where > 25 percent is Non-forested within 750ft	Conversion of Forest to Shrub/herbaceous within 250ft of USACE Vernal Pools (Acres)	Conversion of Forest to Shrub/herbaceous in Waterfowl and Wading Bird Habitat (Acres)	Conversion of Forested Wetland to Maintained Early-successional Habitat (Acres) [USACE]
40A	0.00	0.00	1.77	0	0.00	0	0.00	0.00	0.00
40B	0.00	0.00	0.02	0	0.00	0	0.00	0.00	0.02
41	0.00	0.00	1.89	0	0.00	0	0.00	0.00	0.00
Spring Street Substation Interconnect	0.01	0.00	0.01	0	0.00	0	0.00	0.00	0.00
TOTAL	**0.85**	9.73[1]	109.81[1]	86	70.21	17	12.96	46.17	366.94[1]

[1]- The wetland impact acres reported in this table are the actual totals and do not match the impact acres reported in the compensation plan. The reason for this is that in areas where resources overlap only the impacts to the resource with the highest compensation requirement are compensated for.

Table 1-5: Summary of Substation Impacts Requiring Compensation

Substation	Permanent Fill Impacts to Wetlands (Non-WOSS) (Acres)	Permanent Fill Impacts to Wetlands of Special Significance (Acres)	# of Significant Vernal Pools where > 25 percent is Non-forested within 250ft	Permanent Fill within 250ft of Significant Vernal Pools (Acres)	# USACE Vernal Pools where > 25 percent is Non-forested within 750ft	Permanent Fill within 250ft of USACE Vernal Pools (Acres)	Permanent Impacts to Streams (Linear feet)
Albion Road	3.71	0.00	0	0.00	0	0.00	0
Belfast	0.00	0.00	0	0.00	0	0.00	0
Coopers Mills Road	0.00	1.57	0	0.00	0	0.00	0
Highland	0.03	0.00	0	0.00	0	0.00	0
Larrabee Road	0.08	0.27	0	0.00	0	0.00	0
Livermore Falls	0.00	0.00	0	0.00	0	0.00	0
Maguire Road	0.30	0.00	0	0.00	0	0.00	0
Maine Yankee	0.04	0.00	0	0.00	0	0.00	0
Monmouth	0.00	0.00	1	0.49	0	0.00	0
Orrington	0.00	0.00	0	0.00	0	0.00	0
Raven Farm	3.25	0.00	0	0.00	2	0.03	0
Spring Street	0.26	0.00	0	0.00	0	0.00	0
Surowiec	2.56	0.79	0	0.00	0	0.00	1,200
TOTAL	10.23	2.63	1	0.49	2	0.03	1,200

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6.0 VISUAL QUALITY AND SCENIC CHARACTER

6.1 INTRODUCTION

The Maine Power Reliability Program (MPRP) consists of approximately 344 miles of new 115 kV and 345 kV transmission line corridor system upgrades in Penobscot, Waldo, Knox, Kennebec, Oxford, Cumberland, and York Counties. A Visual Impact Assessment (VIA) has been prepared for each segment where physical changes will be occurring.

In addition to the new and upgraded transmission lines, MPRP will include the following activities to construct, expand, or remove electrical substations:

- Construct five new substations: Albion Road Substation in Benton, Coopers Mills Road Substation in Windsor, Larrabee Road Substation in Lewiston, Monmouth Substation in Monmouth, and Raven Farm Substation in Cumberland.
- Expand eight substations: Belfast Substation in Belfast, Highland Substation in Warren, Livermore Falls Substation in Livermore Falls, Maguire Road Substation in Kennebunk, Maine Yankee Substation in Wiscasset, Orrington Substation in Orrington, Spring Street Substation in Westbrook, and Surowiec Substation in Pownal.
- Remove three substations: Days Corner switch station in Monmouth, Maxcys Substation in Windsor, and Wales Corner Substation in Wales.

A VIA has been prepared for each substation where physical changes will be occurring.

Each VIA follows the methodology and addresses the standards described in the Maine Department of Environmental Protection's (MDEP) Natural Resource Protection Act (NRPA) Chapter 315 Regulations and also addresses the standards in the Site Law's Chapter 375.14 (Scenic Character). This is the same format that has been used recently for Central Maine Power's Maguire Road Project, which consisted of four expansion components (rebuilds of existing transmission lines Sections 163, 197, 219, and construction of the new Maguire Road switchyard) in Gorham, Scarborough, Saco, Biddeford, Arundel, Kennebunk, North Berwick, South Berwick, and Eliot.

Chapter 315 requires an applicant to demonstrate that a proposed activity will not unreasonably interfere with existing scenic and aesthetic uses of a scenic resource and only applies to activities in, on, over, or adjacent to a protected natural resource.[1] More broadly, Chapter 375.14 requires an applicant to demonstrate that the development will not have an unreasonable adverse effect on the scenic character of the surrounding area.[2] Potential impacts to identified scenic resources, and other points of local sensitivity, have been assessed within each segment.

For purposes of this assessment, the viewshed generally extends one mile from the new or upgraded transmission lines and substations.[3] The analyses also document all scenic resources that may be present within four miles of the transmission line corridors.[4]

Throughout this assessment, all references to rebuilding or re-rating transmission lines are limited to the Natural Resources Protection Act Application. Rebuilt and re-rated lines are exempt from review under the Site Law, 38 M.R.S.A. § 488.

6.1.1 Data Collection

Terrence J. DeWan & Associates (TJD&A), landscape architects in Yarmouth, Maine, conducted field evaluations, photographed existing conditions, and prepared the visual impact assessments for each of the transmission line segments and substations. TJD&A staff collected field data by driving, walking, and photographing the study area to assess visibility from the public roads and viewpoints. Specific field evaluation dates are noted in each segment report. Photographic documentation was made using a Nikon D70 or D300 digital camera. For most photographs the camera was set to record at a "normal" focal length (*i.e.*, equivalent to that found on a 50mm SLR camera). Representative views within the study area are documented in a photo log at the end of each segment report. Additional photographs of each segment and substation, including

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[1] A Scenic Resource is a public natural resource or public land visited by the general public, in part for the use, observation, enjoyment, and appreciation of natural or cultural visual qualities. The attributes, characteristics, and features of the landscape of a scenic resource provide varying responses from and varying degrees of benefits to, humans. *Chapter 315, Maine Department of Environmental Protection.*

[2] Applicants are required to provide evidence that 1) the design of the proposed development takes into account the scenic character of the surrounding area; 2) development which is not in keeping with the surrounding scenic character will be located, designed and landscaped to minimize its visual impact to the fullest extent possible, and 3) structures will be designed and landscaped to minimize their visual impact on the surrounding area. *Chapter 375.14.*

[3] The one-mile limit is derived from the MDEP's Visual Evaluation Field Survey Checklist. In most instances new structures will not be highly visible at distances greater than one mile.

[4] The four-mile limit is derived from Landscape Aesthetics: A Handbook for Scenery Management. United States Department of Agriculture Forest Service, Agricultural Handbook Number 701, December 1995.

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all road crossings, adjacent homes and other development, existing significant roadside buffers, substation fences and buffers, and landscape details, are available in digital form upon request from TRC.

Other data sources include the United States Geological Survey (USGS) based site plans, substation grading plans, aerial photographs, and cross-sections and elevations provided by TRC; maps from the Comprehensive Plans from individual towns; Land for Maine's Future website; Maine Department of Conservation (MDOC) websites for State Parks, Wildlife Refuges, and Interconnected Trail Systems (ITS); National Park Services' National Natural Landmark website; The Nature Conservancy; sites listed on the National or State Register of Historic Places; Maine Lakes Study; Maine Rivers Study; DeLorme Atlas and Gazetteer; Google Earth, Live Search Maps, and other secondary data sources.

6.1.2 Program Study Area

Site Context

For each VIA, the physical context is described in terms of the land use, vegetation patterns, land form, and water bodies adjacent to the transmission line corridor or substation site. The narrative evaluates existing vegetative buffers where present and their effectiveness in screening the facilities within the corridor from nearby land uses and scenic resources. Representative photographs are included in each segment to supplement the narrative and to note areas of particular visual interest.

In keeping with MDEP policies, the VIAs have concentrated on views from publicly accessible viewpoints, primarily roads, trails, public lands, and water bodies. Representative photographs are included in **Exhibit 6-4** (Segment Photographs) and **Exhibit 6-5** (Substation Photographs) to supplement the narrative and to note areas of particular interest.

Distance Zones

The concept of distance zones is based upon the United States Department of Agriculture (USDA) Forest Service's visual analysis criteria for forested landscapes and on the amount of detail that an observer can differentiate at varying distances. The distance zones used for the study of the proposed MPRP are defined as:

Foreground (0 to 1/2 mile in distance): Within this distance zone, observers are able to detect surface textures, details, and a full spectrum of color. The majority of public views described in the VIA are in the foreground where transmission lines cross or transmission lines or substations are adjacent to public roads, streams, rivers, or other scenic resources.

Midground (1/2 mile to four miles in distance): In the midground, the details found in the foreground become subordinate to the patterns observed in the larger landscape as a whole. In panoramic views, the midground landscape is the most important element in the composition in determining visual impact. Transmission lines are part of the midground landscape in several types of situations, such as when approaching a road crossing adjacent to open fields, when seen from a public viewpoint on the opposite side of a valley, or when seen on hillsides. The MPRP substations are infrequently part of the midground landscape. Where they are visible at distances greater than 0.5 miles, they are usually seen over agricultural fields and are often partially screened by existing trees.

Background (greater than four miles): Changes to the landscape seen at this distance are highly visible only if they present a noticeable contrast in form or line. There are a few instances where an existing transmission line corridor clearing is visible crossing over a hill, appearing as a notch in the vegetation. The additional structures and occasional clearing proposed for MPRP will be only slightly noticeable at distances beyond four miles. The effects of atmospheric haze would also significantly reduce views of clearings and structures. None of the substations are visible at distances greater than four miles.

6.1.3 Inventories of Scenic Resources within the Viewshed

A MDEP Visual Evaluation Field Survey Checklist for Scenic Resources has been completed for each transmission line segment and substation (**Figure 6-1**). Background information has been added to the checklist for any scenic resources or other visually sensitive areas within the viewshed of the transmission line corridors and substations.

6.1.4 Photosimulations

Photosimulations (computer-altered photographs) have been prepared to illustrate the anticipated changes to the transmission line corridors and the surrounding landscape. The simulations concentrate on scenic resources that may be affected by the upgrade.

As noted earlier, photographs used in the photosimulations were taken during field work with a Nikon D70 digital camera, set to shoot at a focal length equivalent to a 50 mm ("normal") lens. The locations of all photographs were recorded with a GPS unit. In some instances, pairs of photographs were merged in Photoshop to provide a more realistic view of the landscape.

Images of the proposed structures or other changes to the corridors were created in SketchUp and placed into GoogleEarth Pro images of the corridors, cut to match existing condition photographs. The resultant images were then imported into Photoshop to create the photosimulation. The relative size of these new elements was supplied by TRC and located by TJD&A by measuring aerial photographs. Structures that will be removed as part of the upgrade were similarly taken out of the image in Photoshop.

In evaluating the photosimulation, the reviewer should hold the image at the distance specified on the photograph to approximate the actual view.

6.1.5 Affected Population/User Expectations

There are several groups of people who may be affected by the improvements proposed under this program. 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 MPRP upgrades is site specific and will range from minimal to moderate in most locations and high in limited instances.

Residents

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The primary viewing population is the year-round residents who live along the roads that intersect or run along the transmission line corridors or who live within the viewshed of the substations. The majority of the homes that may see the transmission line corridors are 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.

Local Motorists

This category of users includes local residents, commuting traffic, delivery personnel, and others who use local roads as part of their daily routines.

Recreating Population

There are many types of recreation enjoyed by people who use existing transmission line corridors or the resources within their viewshed and/or lands surrounding the substations for a variety of pursuits, including snowmobiling, all terrain vehicle (ATV) riding, mountain biking, boating, fishing, swimming, bird watching, cross-country skiing, snowshoeing, hiking, dog-walking, and berry-picking.

Working Population

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

6.1.6 Visual Impact Assessments

A visual impact assessment has been performed for each transmission line segment and substation of the MPRP. The potential impacts on scenic resources and existing public scenic and aesthetic uses were evaluated within the identified project viewshed, which 98 percent of the time is situated within or immediately adjacent to existing transmission line corridor. The evaluation is based upon knowledge of the MPRP site gained from fieldwork, preliminary plans

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from TRC, resource mapping, a review of the photosimulations and other data sources. The narrative for each segment and substation follows the MDEP Chapter 315 Regulations, as noted below. MDEP's Basic Visual Impact Assessment Form[5] (VIA Form) is used as a starting point to determine the severity of potential visual impacts, based upon an evaluation of the project's visual elements (*i.e.*, landscape compatibility, scale contrast, and spatial dominance). The sections *in italics* are quotes from the Chapter 315 Regulations.

Landscape Compatibility

Landscape compatibility, which 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. Each sub-element is evaluated for how compatible the change resulting from the MPRP activity will be with its surroundings and whether there will be no, minimal, moderate, or severe contrast.

- Color: This section describes anticipated color contrasts between existing conditions and proposed materials to be used for the upgrade. In the case of transmission structures, new wooden poles may initially be darker than the existing poles but the contrast will 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.

  Most of the electrical equipment used in substations will be galvanized or painted a silver color, which should match the existing equipment. In the case of new substations the color should have a moderate contrast with the surrounding vegetation and wood transmission structures.

- Form: The form (three-dimensional shape) of the transmission structures that are being proposed for the MPRP are typical of those currently found in transmission line corridors throughout central and southern Maine. 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 to severe contrasts in form may result in situations when there is disparity between the existing and proposed transmission structures (*e.g.*, a new H-frame structure located adjacent to an existing lattice structure).

[5] The Basic Visual Impact Assessment Form is found in MDEP Guidance for Assessing Impacts to Existing Scenic and Aesthetic Uses under the Natural Resources Protection Act. July 20, 2003.

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- Line: The VIA 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) will 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 expanded substations there should be minimal to moderate contrast in line, depending upon whether the new components will 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 vast majority of the structures used will be wood, with 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. There may be moderate contrasts in texture in situations that use self-weathering steel, which has a smoother texture (and darker color) than the standard wooden poles.

  The texture of the expanded substations should be similar to the existing facilities, so there should 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.

Scale Contrast

Scale contrast is determined by the size and scope of the proposed activity given its specific location within the viewshed of a scenic resource.

The VIAs describe the change in scale between the existing and proposed transmission lines, how the transmission structures fit into the maintained corridor, and how the transmission structures relate to the size of trees that line the corridor (where appropriate). The change in scale of the transmission line(s) and corridors resulting from the MPRP activity is evaluated for the degree of contrast with the surrounding landscape.[6] For example, a minor change in scale might be an existing transmission line corridor with multiple 115 kV transmission lines where one is being upgraded to a 345 kV transmission line, or an existing transmission line corridor widened by 50 feet or less. A moderate change in scale might be an existing transmission line

[6] The Buffer Evaluation Form developed for the Roadside Visual Buffer Report (Exhibit 6-2) is based upon the degree of visible change to existing conditions, which is closely related to the scale of the project.

corridor that will be widened by 50 to 150 feet, or an existing transmission line corridor with a single 115 kV transmission line that will be expanded to include a 345 kV transmission line. A significant change in scale might be a situation in which an existing transmission line corridor is widened by more than 150 feet, or an existing 34.5 kV transmission line is upgraded to a 345 kV transmission line.

The VIA describes the relative size of the substation or the expansion, in comparison to its surroundings (transmission structures, existing trees, nearby homes or other adjacent land uses). This section also examines whether the components for both new substations and expansions will be seen above the surrounding forest cover.

A minor change in scale might be a 10 to 25 percent visible increase in the footprint of the existing substation with little height differential with the surrounding trees and/or transmission structures. A moderate change in scale might be a 25 to 66 percent visible increase in the footprint of the substation, with new components taller than the existing components. A significant change in scale might be a visible change in the footprint of the substation greater than 66 percent and a substantial number of electrical components visible above the tree line.

In making a final determination of scale contrast for both new and expanded substations, the VIA takes into consideration the presence of existing trees, earthen berms, or other natural or man-made features that block the view of the facility. The VIA also recognizes the ability of visual buffer plantings and earthen berms to minimize the visual impact of the substations by reducing its visible mass and introducing naturalistic forms in the immediate foreground.

Spatial Dominance

Spatial dominance is the degree to which an activity dominates the whole landscape composition or dominates landform, water, or sky backdrop as viewed from a scenic resource.

The VIAs describe whether the proposed transmission line(s) or new or expanded substations dominates or is prominent in the whole landscape composition, or is prominently situated within the landscape, or dominates the surrounding landforms, nearby water bodies, or the sky. This section considers the presence or absence of screening vegetation between the viewpoint and the transmission structures or substations, the type and character of viewpoints (both roadside and from scenic resources), and the number of viewers and their respective sensitivity. The dominance of the transmission lines or substations is evaluated for their relative prominence in the landscape: insignificant; subordinate to the surrounding natural and cultural elements in the landscape; co-dominate the landscape; or dominate the landscape, the immediate setting, or the backdrop.

The severity of potential visual impact is determined by professional judgment on the part of TJD&A landscape architects who consider Landscape Compatibility (color, form, line, and texture), Scale Contrast, and Spatial Dominance to determine whether the visual impact will be negligible, moderate, strong, or severe. The evaluation is based upon first-hand knowledge of the specific site; a review of site photography and aerial photographs; MPRP design parameters for the individual transmission lines (cross-sections, areas of tree clearing) and substations; and photosimulations of the transmission lines see **Exhibit 6-2** (Roadside Buffer Report) and **Exhibit 6-3** (Photosimulations).

Transmission lines and substations are usually visible from multiple viewpoints and at different viewing distances. To account for this variability, a range of potential visual impacts is often provided (*e.g.*, moderate to strong) in recognition of both the viewer location and site conditions.

6.1.7 Mitigation Strategies

Mitigation is defined as any action taken or not taken to avoid, minimize, rectify, reduce, eliminate, or compensate for actual or potential adverse environmental impact.[7]

6.1.7.1 Transmission Lines

The primary mitigation measure being employed is to upgrade the electrical system within the current corridors, rather than acquiring and developing new parallel or entirely separate transmission line corridors. This co-location strategy significantly reduces potential visual impacts. The MPRP has been designed to minimize additional clearing and the need for land acquisition by making the most effective use of existing corridors, upgrading existing transmission lines and re-rating lines where possible. New structures will be set back as far from

[7] Maine Department of Environmental Protection. Chapter 315: Assessing and Mitigating Impacts to Existing Scenic and Aesthetic Uses. 5.F. Definitions.

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streams, rivers, and other areas of visual/habitat sensitivity as practicable. The VIA did not include an analysis of building the line underground because the underground alternative was determined to be impracticable.

There are many areas where favorable growing conditions and CMP's maintenance procedures have resulted in effective stands of non-capable species near the roadside which act as visual buffers. Wherever practicable, existing vegetation will be preserved within the transmission line corridor by careful layout of access roads and monitoring of construction practices during the installation process.

In addition, visual buffer plantings, consisting of native, non-capable species,[8] will be installed at certain road crossings to minimize views into cleared transmission line corridors and to offset some of the visual changes from the MPRP activities. CMP has made an initial determination of where to install roadside buffers, using the criteria that are presented in the Roadside Visual Buffer Report, which include:

- Type of road and number of viewers;
- Degree of visible change to the existing conditions;
- The length of time that a motorist will see the transmission line;
- Existing screening vegetation to be removed; and
- Alignment of transmission line corridor.

Over 300 road crossings were evaluated by TJD&A using the criteria in the Roadside Visual Buffer Report, site photographs, the consultant's knowledge of the crossings, and their professional judgment. Data sheets were completed for each road crossing and are available upon request to TRC. **Table 6-1** (Proposed Roadside Buffers) presents a summary of the locations where buffer plantings are being proposed in each of the segments. Detailed planting plans will be prepared by landscape architects for each road crossing identified in **Table 6-1**.

[8] Capable species are those that could ultimately achieve a height that would possibly interfere with or come into contact with electrical conductors. Conversely, non-capable species are those that will not achieve such a height. See **Exhibit 6-2** (Roadside Visual Buffer Report) for further discussion on visual buffer plantings and a list of appropriate species.

Following completion of construction activities associated with the transmission line road crossing the planting plans will be implemented.

Table 6-1: Proposed Roadside Buffers[9]

TOWN	ROAD	COMMENTS
SEGMENT 1		
Orrington	Fields Pond Road	See substation plans for recommended buffers.
Winterport	Route 1A	Buffer on east side of highway.
Frankfort	Stream Road	Recommend buffer on south side of stream between railroad line and stream. No buffers at actual Stream Road crossing.
SEGMENT 3		
Monroe	Dixmont Road	Buffers on west side of road.
Dixmont	Route 202	Buffer Dixmont Town House on southeast side of road.
Detroit	Route 100	Buffer on both sides of the road. Substation on north side.
SEGMENT 6		
Morrill	Weymouth Road	Buffer on north side of road.
Windsor	Coopers Mills Road	Low berm on southwest side of road to buffer substation.
SEGMENT 9		
Detroit	Dogtown Road	Buffer southeast side of road.
Pittsfield	Route 152	Buffer southwest side of road.
Clinton	Mutton Lane Road	Buffers for both sides of road.
Benton	East Benton Road	Buffer on south side of road. See substation plans.
SEGMENT 10		
Benton	Albion Road	Buffers for both sides of road.
China	Route 3	Buffer south side of road.
SEGMENT 14		
Lewiston	Merrill Road	New corridor on south side. Buffer both sides of road. Maintain riparian vegetation.
Greene	Routes 202/11/100	Replant buffers if existing white pine buffers are removed.
Leeds	Fish Street	Buffer on south side of road.
Livermore Falls	Route 133 (Park St.)	Replant buffers if existing white pine buffers are removed from north side of road.

[9] Segments that have no recommended road crossing buffers are not included in Table 6-1.

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TOWN	ROAD	COMMENTS
SEGMENT 15		
Chelsea	Hankerson Road	Reinforce existing buffers on both sides of road.
	Route 9	Buffer on both sides, avoid blocking views to the Kennebec River.
Farmingdale	Route 201	Plant non-capable species on Browns Island to minimize contrast in color and texture as seen from Route 9 and Route 201 and the river.
	Interstate 95	Buffers on both sides of the Interstate.
West Gardiner	Town House Road	New route. Plant buffers along existing drainage ways; avoid interference with existing agricultural uses.
	Litchfield Road	New route. Restore meetinghouse site with native vegetation. Install buffer with informal groupings of large shrubs.
Litchfield	Neck Road	New route. Restore home sites with native vegetation. Install buffer with informal groupings of large shrubs.
	Peace Pipe Road	New route. Install buffer with informal groupings of large shrubs on east side of road.
	Hardscrabble Road	New route. Restore home sites with native vegetation. Install buffer with informal groupings of large shrubs.
Monmouth	Town Farm Road	New route. Buffer on both sides of road.
	South Monmouth Road	See plans for buffer plantings around proposed Monmouth Substation.
Wales	Route 132	Develop buffer plan to replace farm buildings and existing vegetation.
Greene	Lane Road	Reinforce existing non-capable species currently growing within the transmission line corridor.
SEGMENT 16		
Bowdoinham	Center's Point Road	Buffer east side of road.
	Brown's Point Rd (W)	Buffer NE side of road; preserve/reinforce existing vegetation.
	Brown's Point Rd (E)	Buffer both sides of road.
SEGMENT 17		
Lewiston	Sabattus Street	Buffer on both sides of road.
	Maine Turnpike	Buffer on both sides of Turnpike to reduce views of ground plane under cleared transmission line corridor.
Auburn	Riverside Drive	Buffer on river side of road to replace trees being removed. Avoid blocking views of the Androscoggin River.
Pownal	Fickett Road	Buffer south side of road.
SEGMENT 18		
Pownal	North Road	Buffers on both sides of road.

TOWN	ROAD	COMMENTS
	Allen Road	Buffer on east side of road, See Surowiec Substation VIA report.
North Yarmouth	New Gloucester Road	Buffers on both sides of road.
	Gray Road	Buffers on both sides of road.
SEGMENT 19		
North Yarmouth	Cumberland Road	Buffers on both sides of road. Replicate existing non-capable species mix within 34.5 kV transmission line corridor.
Yarmouth	Hillside Road	Buffer on north side of road.
SEGMENT 24		
Saco	Route 5 (New County Rd.)	Plantings on south side of road to buffer view of substation.
Arundel	Route 35 (Alewife Rd)	Buffers on both sides of road.
Kennebunk	Webber Hill Road	Buffers on both sides of road.
SEGMENT 27		
Kennebunk	Maguire Road	Buffer on north side of road. See site plan for Maguire Road Substation.
North Berwick	Dennett Road	115 kV transmission line. Replant buffers if existing white pine buffers are removed from north side of road.
	Emery's Bridge Road	Replant buffers if existing white pine buffers are removed from north side of road.
South Berwick	Route 236	Transmission line parallels Route 236. Preserve and reinforce existing buffers near shoulder of road.
	Woodland Hills	Buffers within multi-family housing if existing trees are to be removed. Avoid interference with recreation areas.
SEGMENT 39		
Livermore Falls	Moose Hill Road	Buffer in vicinity of Livermore Falls Substation. See site plan.

6.1.7.2 Substations

A variety of mitigation strategies have been employed in the development of the site plans for the new and expanded substations to reduce their potential visual impact and achieve a harmonious balance between the facility and the surrounding landscape. These include:

- Making the most effective use of existing sites and upgrading existing substations where possible;
- Setting new substations as far from streams, rivers, and other areas of visual/habitat sensitivity as practicable;

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- Preserving stands of woodland on substation sites where possible as visual buffers;
- Planting visual buffers where appropriate between public viewpoints and the perimeter fencing, allowing adequate room for surveillance; and
- Incorporating earthen berms where practicable to screen portions of the substation. Where earthen berms are proposed, proper consideration will be given to stormwater runoff, ultimate height of vegetation on the berms, location of transmission structures, security and visibility, and related factors.

Schematic plans showing visual buffers have been developed for the substations and are illustrated on the site plans in **Exhibit 6-5** (Substations).

The selection of trees and shrubs for buffer plantings at individual locations will be based on specific site conditions to determine the optimum species mix. The site evaluation will include a number of factors:

- Soil conditions (presence of wetland, depth to bedrock, soil types);
- Sun/shade patterns;
- USDA Plant Hardiness Zones;
- Desirable height and spread;
- Need for maintenance access into the transmission line corridor;
- Security: allowing for surveillance at substations;
- Existing vegetation;
- Aesthetic considerations (four-seasonal interest); and
- Wildlife habitat.

A master list of plant material that may be suitable for buffers has been developed by TJD&A and is included in **Exhibit 6-2** (Roadside Visual Buffer Report). In some locations where plantings are not within transmission line corridors (*e.g.*, to provide visual buffers around substations), species capable of achieving heights in excess of 10 feet may be used.

In addition, as noted above, MPRP will decommission and remove four substations from their present locations and revegetate the sites.

6.1.8 Conclusion

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The VIA for each segment demonstrates that the proposed activity meets the standards for visual quality established under Chapter 315 and the Site Law's Chapter 375.14 (*i.e.*, that the proposed activity will not unreasonably interfere with existing scenic and aesthetic uses of a scenic resource and that the development will not have an unreasonable adverse effect on the scenic character of the surrounding area).

6.2 TRANSMISSION LINES

6.2.1 SEGMENT 1

Segment 1 includes the construction of a 115 kV transmission line and a 345 kV transmission line in an existing 15.51-mile transmission line corridor from the Orrington Substation north of Fields Pond Road to the point where it meets Segments 3 and 4 (6,600 feet southwest of Loggin Road) in Frankfort. This segment is located in the towns of Orrington, Bucksport, Winterport, and Frankfort.

Segment 1 currently has an existing 345 kV H-frame transmission line in a mostly cleared transmission line corridor. An existing gas pipeline and AT&T cable are co-located in the corridor. The gas pipeline is located near the north (or west) edge of the corridor (the exact location varies), while the AT&T cable is located 20 feet from the south (or east) edge of the corridor.

In the middle portion of Segment 1 the existing 345 kV transmission line is supported by lattice structures as it approaches and crosses the Penobscot River in Bucksport and Winterport. The lattice structures are located in a 170± foot-wide cleared portion of the northern side of a 500 foot-wide transmission line corridor. Over much of Segment 1, CMP has acquired additional land that is typically 100 feet wide to expand the current corridor width from 270 to 370± feet.

Most of the southern portion of Segment 1 (approximately 6.3 miles) includes:

- The construction of a 345 kV transmission line with H-frame structures, located generally to the east and parallel to the existing 345 kV transmission line.

- Form: The form of the 75 foot tall H-frame structure is typical of those found throughout southern Maine. The MPRP is expected to result in a minimal contrast in form.
- Line: The edge of the corridor clearing will increase by 40 to 80 feet (an increase of 36 percent over the existing width) for approximately one half (10 miles) of Segment 24. The 345 kV H-frame structures will be parallel to the existing transmission structures within the corridor. The MPRP is expected to result in a minor contrast in line.
- Texture: The texture of the proposed structures will be similar to the existing structures and should not cause a contrast in texture.

Scale Contrast

In most cases the 345 kV H-frame transmission line will be seen in context of the two 115 kV transmission lines within the existing corridor, and against 50 to 70 foot tall surrounding vegetation. The proposed H-frame structures will be approximately the same height as the newly installed 115 kV single poles. There will be moderate scale contrast as seen from roads and rivers.

Spatial Dominance

In most locations the MPRP will be contained within the existing cleared transmission line corridor. When seen from the scenic resources identified above, the new transmission line will not dominate the landscape composition or the surrounding land forms, water bodies, or sky.

6.2.15.6 Conclusion

Based upon a review of the program, the proposed Segment 24, 345 kV transmission line upgrade should not unreasonably interfere with existing scenic and aesthetic uses and should not have an unreasonable adverse effect on the scenic character of the surrounding area.

6.2.16 SEGMENT 27

Segment 27 includes the construction of a 345 kV transmission line in an existing 19-mile transmission corridor from the Maguire Road substation in Kennebunk to the Three Rivers substation in Eliot. It also includes the relocation of an existing 115 kV transmission line between the Quaker Hill substation in North Berwick and the Three Rivers substation. This segment is located in Kennebunk, Wells, North Berwick, South Berwick, and Eliot.

The existing transmission corridor varies in width from 150 to 340± feet and currently contains one, two, or three 115 kV transmission lines in a variety of configurations. In some locations the corridor also includes a 34.5 kV transmission line and a 12.5 distribution line. A gas pipeline is located near the edge of the corridor throughout most of Segment 27. North of the Quaker Hill substation the pipeline is mainly on the west side of the corridor. South of the Quaker Hill substation, the pipeline is primarily on the east side of the corridor.

Segment 27 consists of two different sub-segments, divided by the Quaker Hill substation. The northern portion (approximately 10.7 miles in length) that runs between the new Maguire Road substation in Kennebunk and the Quaker Hill substation. The majority of this portion (8.7 miles) has two 115 kV transmission lines: one is supported by H-frame transmission structures; the other is supported by single-pole structures. The proposed MPRP activities in this portion of Segment 27 will include a new 345 kV H-frame transmission line located on the east side of the transmission corridor.

An 8.7± mile portion will require approximately 75 feet of additional clearing on the east side of the 300-foot wide transmission corridor. In addition, a strip of capable species that currently separates the existing transmission corridor and the gas pipeline will also be removed in the 0.6-mile section immediately south of the Maguire Road substation. For 1.4 miles near the Quaker Hill substation, an additional 20 feet of land on the west side of the transmission corridor will be purchased and cleared of capable species.

The southern portion of Segment 27 (approximately 8.5 miles in length) runs between the Quaker Hill substation and the Three Rivers in Eliot and has a single 115 kV transmission line on single-pole structures. The proposed MPRP activities in this portion of Segment 27 includes:

- The construction of a new 345 kV transmission line located on the east side of the transmission corridor. For the first 6.5 miles south of Quaker Lake substation the transmission line will be supported by H-frame structures. For the 2.0 miles north of the Three Rivers substation the transmission lines will be supported by single-pole single-circuit structures.
- The relocation of an existing 115 kV transmission line on H-frame structures to single-pole structures. This transmission line will be located between the existing single-pole 115kV transmission line and the new 345 kV transmission line.

The existing 115 kV transmission lines in Segment 27 vary in design and height and include: H-frame structures that are typically 45 feet tall, single-circuit single-pole structures that are typically 65± or 75± feet tall, and double-circuit single-pole structures that are typically 80± feet tall. The 34.5 kV transmission line is supported by single-pole structures that are typically 35 feet tall. The 12.5 kV distribution line is supported by single-pole structures that are typically 35 feet tall.

Most of the new 345 kV transmission line will consist of H-frame transmission structures that are typically 75 feet tall. The southernmost 2.0± miles will be single-circuit single-pole structures that are typically 95± feet tall. The relocated 115 kV transmission line (south of the Quaker Road substation) will be supported by single-poles structures that are typically 75± feet tall.

6.2.16.1 Data Collection

TJD&A staff collected field data in the study area to assess visibility from public roads and other vantage points on June 26 and July 3, 2008. Representative views from each road crossing within the study area are included in Segment 27 Photo Appendix. Other data sources include the aerial photographs and cross sections provided by TRC for the MPRP Project; The Maine Department of Inland Fisheries and Wildlife website; Nature Conservancy website; East Coast Greenway website; comprehensive plans and zoning ordinances where available; Google Earth; and LiveSearch Maps (http://maps.live.com).

6.2.16.2 Study Area

Site Context

Northern Portion. The area within one mile of Segment 27 between Maguire Road substation and the Quaker Hill substation is generally very flat with only slight undulations in landform. The exception is the land immediately surrounding Branch Brook on the Kennebunk/Wells town line where the topography is steeply cut and drops 25-35 feet to the stream. The land use in the vicinity of the transmission corridor is predominantly undeveloped woodland, with some active farmland (primarily hayfields), abandoned fields, several large sand and gravel quarries, and single family residential at relatively low densities. Several new residential subdivisions have been built off the larger town roads adjacent to the transmission corridor. The vegetation is mixed evergreen and deciduous second growth. Where the transmission line is in a forested setting, it is often edged with 40-60 foot tall white pines.

<u>Southern Portion</u>. The area within one mile of Segment 27 south of the Quaker Hill substation is defined by rolling topography with low knolls rising 100 to 130 feet above the surrounding landscape. Landforms generally follow drainage patterns leading to the Great Works and Piscataqua Rivers. The land use in the vicinity of the transmission corridor is predominantly undeveloped woodland and fields and single family residential at relatively low densities. The vegetation is mixed evergreen and deciduous second growth. Where the transmission line is in a forested setting, it is often edged with 50 to 70 feet tall white pines.

The village of South Berwick is 1.5± miles to the west of Section 197. The village of North Berwick is approximately one mile north of the Quaker Hill Substation.

Scenic Resources[16] that were evaluated include Kennebunk Plains Wildlife Management Area and Branch Brook in Kennebunk; the Eastern Trail, Wells Heath, and West Stream in Wells; Dennett Brook, Great Works River, Hussey Brook, and views to Mt. Agamenticus in North Berwick; the Eastern Trail, Knights Brook, Knights Pond, Great Works River, and Lord Brook in South Berwick; and Shoreys Brook in Eliot.

Distance Zone

<u>Foreground (0 to 1/2 mile in distance)</u>: Foreground views of the transmission corridor are primarily limited to views from rivers, road crossings, and nearby roads, which include:

- Kennebunk: Maguire Road.
- Wells: Branch Brook Run, Wire Road, Route 109 (Sanford Road), Bald Hill Road, Bills Lane, Perry Oliver Road.
- North Berwick: Route 9 (Charles Chase Road/Wells Street/Sunset Ridge Road), Linscott Road, Lower Main Street, Company Woods Road, Dennett Road, and River's Edge Road.

[16] As defined by *Chapter 315.10, Maine Department of Environmental Protection.*

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- South Berwick: Great Works River, Knights Pond Road, Renaud Lane, Tara Lane, Emery's Bridge Road, Old Emery's Bridge Road, Hickory Lane, Route 91 (Witchtrot Road/York Wood Road), Fifes Lane, Route 236 (parallel to transmission corridor), Woodland Hills.
- Eliot: Route 101 (Goodwin Road), Route 236/103 (Harold Dow Highway), High Meadow Farm Lane, Woodside Meadow Drive, Heron Cove Road, Worster Lane, Houde Road.

Midground (1/2 mile to four miles in distance): The transmission corridor is visible at distances greater than 1/2 mile in several locations, including the following locations it either crosses the road or is parallel to it. At this distance the line that is created by the repetition of the transmission structures, the conductors, and the vegetation at the edge of the corridor may be more apparent than the individual transmission structures.

- Kennebunk: Maguire Road, Kennebunk Plains
- South Berwick: Route 236 (parallel to transmission corridor).

Background (greater than four miles): None.

6.2.16.3 Inventory of Scenic Resources Within The Viewshed

FIGURE 6-1 - Segment 27
MDEP VISUAL EVALUATION FIELD SURVEY CHECKLIST
(Natural Resources Protection Act, 38 M.R.S.A. §§ 480 A - Z)

Name of applicant: Central Maine Power and PSNH
Application Type: SLODA / NRPA
Activity Type: Segment 27, Installation of 345 kV transmission line
Activity Location: Kennebunk, Wells, North Berwick, South Berwick, Eliot.
County: York
GIS Coordinates, if known: See project location maps from TRC
Date of Survey: June 26 and July 3, 2008
Observer: Amy Segal
Phone: 846-0757

Visibility	**Distance Between the Proposed Activity and Resource (in Miles)**		
1. Would the activity be visible from:	0-1/4	1/4 – 1	1+
A. A National Natural Landmark or other outstanding natural feature? None	☐	☐	☐
B. A State or National Wildlife Refuge, Sanctuary, or Preserve or a State Game Refuge?	■	■	☐

Segment 27 will be visible from the southern portion of the adjacent Kennebunk Plains Wildlife Management Area (WMA). Kennebunk Plains is a 3,200-acre protected grassland community that was preserved by a joint effort between The Nature Conservancy and Maine Department of Inland Fisheries and Wildlife, who now manage the property. In addition to existing transmission lines, the Plains are crossed by several roads and trails, which provide opportunities to observe birdlife and native flora. Views across the Plains near Maguire Road include three 115kV transmission lines (two with single-circuit structures typically 75± feet tall and one with double-circuit structures that are typically 80± feet tall), and overhead conductors The addition of the 345 kV transmission line should have a slight to moderate visual impact on the southern portion of the Kennebunk Plains, depending upon the viewing distance and the amount of vegetation between the observer and the transmission corridor.

C. A state or federal trail? ■ ☐ ☐

The Eastern Trail is a state-designated multipurpose trail that will extend from Kittery to South Portland, Maine. The Trail is a link in the East Coast Greenway that will ultimately span 3,000 miles from Calais, Maine to Key West, Florida. In Maine, the Trail will occupy the abandoned Eastern Railroad corridor that is crossed by Segment 27 in Wells and parallels it in North Berwick, South Berwick, and Eliot. In the short term, where the corridor is not accessible, an on-road route has been designated. The temporary on-road trail crosses under the transmission corridor twice; once on Knights Pond Road near Knights Pond in South Berwick and once on Route 236 in Eliot. Segment 27 may have a slight to moderate visual impact on the off-road section of the Eastern Trail, once it is built. In most locations the new 345 kV transmission line will be on the far side of the transmission corridor, relative to the potential location of the trail. Where the Eastern Trail will follow the abandoned rail corridor, there should be a substantial buffer of existing vegetation between the trail and the transmission corridor. Buffering may be appropriate at the point where Segment 27 crosses the trail, north of Route 109 (Sanford Road) in Wells.

Parts of the existing transmission corridor are informally used by ATV riders, snowmobilers, and hikers who are accustomed to seeing the existing 115 kV structures. Visual impact to users should be minimal. There are no ITS snowmobile routes that cross Segment 27.

D. A public site or structure listed on the National Register of Historic Places? ☐ ☐ ☐

Potential visual impacts to resources that are on or eligible for inclusion in the National Register of Historic Places have been addressed in the Segment 27 Report that has been submitted to the Maine Historic Preservation Commission.

E. A National or State Park? ☐ ☐ ☐

None. Vaughan Woods State Park in South Berwick is one mile to the west and will not be affected by Segment 27 because of intervening topography and vegetation.

F. 1) A municipal park or public open space? ■ ■ ☐

The athletic fields surrounding Marshwood High School, located on Route 236 in South Berwick, are partially screened from the road and the adjacent transmission corridor. Segment 27 will be visible from the track, ball fields, and other facilities, but should not affect how the community uses them. Segment 27 should have minimal visual impact on these facilities.

Powderhouse Hill, a small ski hill on the east side of South Berwick that is owned by the Town. The hill offers a scenic view towards the north and northeast but does not include a view of Segment 27. There should be no visual impacts on Powderhouse Hill.

The Spring Hill Recreation Area on Knights Pond in South Berwick (a private recreation area owned by Spring Hill Corp.) allows public use and is approximately 1700 feet from the existing transmission line. The view across the pond toward the transmission line will be improved by replacing the H-frame structures with a single pole structure.

There is a small ball field on the corner of Route 236 (Harold Dow Highway) and Worster Road in Eliot, approximately 275 feet to the southeast of the existing transmission corridor. Segment 27 is buffered by 175± feet of mixed woodland and should not be visible from the field. There should be no visual impacts to the ball field.

2) A publicly owned land visited, in part, for the use, observation, enjoyment and appreciation of natural or man-made visual qualities? ☐ ☐ ■

At its closest point the summit of Mount Agamenticus is located over 4 miles to the east of the transmission line. From this vantage point, Segment 27 should not be readily distinguishable because it runs perpendicular to the summit and is seen in context with many other cultural modifications.

The Nature Conservancy developed the Conservation Plan for the Mount Agamenticus Region[17] in part to 'protect the quality of identified scenic viewshed from being altered or diminished'. Map 10 of the Plan, Cultural Landscapes, Historic Sites, and Scenic Views, describes two viewpoints with relevance to Segment 27. The primary viewpoint is from the summit of Mount Agamenticus toward the northwest over a forested and rural landscape. The 50-75 feet of additional clearing and taller structures of Segment 27 may be noticeable from the summit on exceptionally clear days. The visual impact should be minimal due to the distance (4+ miles) and the surrounding pattern of roads, rail lines, villages, and similar cultural features.
The second identified view is from Cabbage Hill looking southeast on Route 4 in North Berwick toward Mount Agamenticus. This viewpoint is approximately 1,400 feet northwest of the point where the transmission corridor crosses Knights Pond Road in South Berwick. The upper 25± feet of the new 345 kV H-frame structures and the new single-pole 115 kV structures and some of the conductors may be visible above the mature trees that line the abandoned Eastern Railroad line. The visible transmission structures should be seen against the lower wooded slopes of Great Hill on the east side of Knights Pond Road and should not appear to break the horizon. Segment 27 should have a moderate visual impact on the view from this viewpoint.

3) A public resource, such as the Atlantic Ocean, a great pond or a navigable river? ■ ☐ ☐

In South Berwick, Segment 27 crosses Great Works River in several locations north and south of Emerys Bridge Road. The 11-mile segment of the river from the Old North Berwick Road to the Pond in the River near the outlet into Salmon Falls River (which includes the transmission corridor crossings) is rated as a "D" river by the Maine Rivers Study[18] for its Critical/ecologic resources. The Study determined that none of the scenic resources of the river were unique or significant, i.e., they did not meet a minimum standard of significance. The AMC River Guide describes the Great Works as 'an unassuming little river' and the scenery along its banks as 'forested'. Segment 27 will replace a 45± foot tall, 115 kV H-frame transmission line with a single-pole 75± foot-tall transmission line; add a 115 kV transmission line supported on single-pole structures that are typically 75± feet tall; and add a new 345 kV transmission line supported by H-frame transmission structures that are typically 75± feet tall. No additional clearing will be required at the river crossings. Most of the existing crossings occur at sharp bends in the river, which limits the amount of time that boaters have to view the transmission corridor. The additional structures and conductors should have a moderate visual impact on river users.

There will be a moderate to strong visual impact on the small streams that intersect the transmission corridor (i.e., Branch Brook in Kennebunk, West Stream in Wells, Dennett Brook and Hussey Brook in North Berwick,

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[17] A Conservation Plan for the Mount Agamenticus Region: A Community Plan for the Future, The Nature Conservancy, April 2004. The Plan gives recommendations on how a town, state or federal agency can help conservation efforts.

[18] According to the Maine Rivers Study, a "D" rated river or river segment possesses natural and recreational values with regional significance.

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Lord Brook in South Berwick, and Shoreys Brook in Eliot) due to the increase in the height and number of transmission structures.

2. **What is the closest estimated distance to a similar activity?** ☒ ☐ ☐

The proposed transmission line(s) will parallel the existing transmission line(s) within the existing corridor.

3. **Are any of the resources checked in Question 1 used by the public during the time of year during which the activity will be visible?** ☒ Yes ☐ No

The transmission corridor is used throughout the year for a variety of recreation pursuits. The on-road section of the Eastern Trail is used year round by bicyclists and hikers. The Great Works River use is mainly during the fishing/boating season, but may have limited use for snowmobiling in the winter.

6.2.16.4 Affected Population

There are four general groups of people who already see the existing transmission lines at times during the year and may be affected by the construction of the project.

Local Motorists

The primary viewing population is the year-round residents who live or work in Kennebunk, Wells, South Berwick, North Berwick, and Eliot and who use State Routes 109, 9, 91, and 236 as well as the local roads. Segment 27 will involve 24 road crossings in its 19-mile length. Motorists presently see several configurations of transmission lines and conductors within the corridor.

The proposed changes throughout Segment 27, which include the addition of one new 345 kV transmission line and a new 115 kV transmission line (south of Quaker Hill substation), the replacement of 45± foot tall H-frame structures with 75± foot tall single pole structures, and the removal of capable species in a 50-75± foot strip, should have a moderate to strong impact on motorists crossing the transmission line. The most noticeable visual impact will be seen on Route 236 in South Berwick between Fifes Lane and Lords Lane. Segment 27 is located immediately to the east of the highway in this 1.3-mile section, with virtually no vegetation to screen the motorist's view.

Residents

There are approximately 100 homes that are located directly adjacent to, or may have a view of, Segment 27. The majority are single family homes on individual lots in rural settings. For the most part, the homes are oriented away from the transmission corridor. In most locations homeowners have maintained a sufficient amount of woods on their properties to provide an adequate buffer between themselves and Segment 27. In a few locations (e.g., Bills Lane in Wells, Linscott Road in North Berwick, and Knights Pond Road in South Berwick) open fields allow for greater visibility of the existing transmission corridor. One home on Bald Hill Road in Wells has cleared all the trees on the lot and, with the 75 feet of additional vegetation removal proposed for this part of Segment 27, will be left with little or no buffer between the home and the transmission corridor. In general, there should be minimal visual impact to homeowners in wooded settings resulting from the Segment 27 activities. Where homes are located in open field settings or adjacent to cleared parcels with views of the transmission corridor, Segment 27's changes in scale and material should result in moderate to strong visual impact.

Segment 27 bisects the Woodland Hills Condominiums in South Berwick. Six of the development's 25 multi-unit buildings are oriented with the rear of the building toward the transmission corridor. Segment 27 may remove some vegetation between two of these buildings and increase visibility for those homeowners. The transmission corridor is generally maintained as lawn and appears to be used for passive recreation. The active recreation areas within the community (community center, tennis courts and swimming pool) are located closer to Route 236 and do not have views of the existing transmission corridor. Segment 27 will increase the number of transmission lines in the transmission corridor and will introduce metal transmission structures in a corridor that previously had only wood transmission structures. These changes in scale and material should have a moderate to strong visual impact to the Woodland Hills Condominiums.

Recreating Population

Existing informal trails within the transmission corridor are used by ATV riders, snowmobilers, and hikers. Current recreational users are accustomed to riding or walking in the cleared transmission corridors and seeing transmission structures and overhead conductors. There should be minimal visual impact to these users resulting from the Segment 27 activities.

The additional transmission line and transmission structures should have a moderate visual impact on the view from the Great Works River. The width of the transmission corridor will not

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change and dense riparian vegetation partially screens views of the transmission corridor. Users are already accustomed to seeing conductors and transmission structures at these locations on the river. Most of the existing crossings occur at sharp bends in the river, which limits the amount of time that boaters have to view the transmission corridor.

See **Figure 6-1** above for a description of the potential visual impacts on the Eastern Trail.

Working Population

There are approximately 15 businesses located directly adjacent to Segment 27, including a store fixture shop, gravel pits, auto salvage yards, a dance studio, an auto repair and dealership, equipment manufacturing, restaurants, a hair salon, a Bed and Breakfast, Marshwood High School, and small home businesses. In addition, the Trailblazer Family Club (a local snowmobile clubhouse that is also rented out for commercial uses) is located adjacent to the transmission corridor on Bill Lane in Wells. There should be slight visual impacts to the working population in the area.

6.2.16.5 Visual Impact Assessment

Landscape Compatibility

- Color. For most of Segment 27, the colors and materials to be used for the proposed structures will be similar to the existing wooden H-frame structures that viewers are familiar with. The new wood structures may initially be darker than the existing ones, but the contrast will diminish with time as normal aging occurs. The exception will occur at the southern 2.0± miles of the transmission corridor in South Berwick and Eliot, where self-oxidizing single-pole steel structures will be used. Their dark brown appearance should result in a relatively minor visual impact when seen in context with the existing and proposed wooden single-pole structures.
- Form. Segment 27 will have a variety of different transmission structures throughout its length, including existing H-frame structures that are typically 45 feet tall; new H-frame structures that are typically 75± feet tall; single-circuit single-pole structures that are typically 65± feet or 75± feet tall; double-circuit single-pole structures that are typically 80± feet tall; steel single-pole 345 kV structures that are typically 95± feet tall; and single-pole structures that are typically 35 feet tall. The use of different structures within the transmission corridor should result in a moderate contrast in form within the transmission corridor.

- Line. The new H-frame and single-pole transmission structures will be similar in line and height to the existing single-pole structures. There should be relatively minor contrasts in line from Segment 27. In some limited areas the upper portion of the larger transmission structures and the conductors may be visible above the existing vegetation, which should result in a moderate contrast in line.
- Texture. The texture of the proposed structures will be similar to the existing structures and should not cause a contrast in texture.

Scale Contrast

When seen from inside the transmission corridor in most locations, Segment 27 will reduce the scale contrast between individual transmission structures by making them all 75± feet in height or taller. Currently the transmission corridor has 45 foot tall H-frame transmission structures paralleling single-pole structures that are typically 75± feet tall. This causes a relatively minor contrast in scale, partially due to the 105 to 125 feet (or greater) that separates the two transmission lines.

When seen from outside the transmission corridor, Segment 27 will have a noticeable affect on the scale of the transmission structures. The proposed 345 kV structures will typically be 30 feet taller than the existing H-frame structures they are replacing and somewhat taller than the trees that line the transmission corridor. The scale contrast will be especially strong in the southern 2.0 miles of this segment, where the new 345 kV single-pole structures will typically be over twice as tall as the 115 kV H-frame structures that they are replacing. This contrast in scale should vary from moderate to strong, depending on where the transmission lines are seen from public roads, rivers, or other public viewpoints.

Spatial Dominance

Segment 27 will require a relatively minor adjustment to the width of the existing cleared transmission corridor. When seen from the scenic resources identified above, the existing and new transmission lines will be very noticeable in many locations but should not dominate the whole landscape composition or the surrounding land forms, water bodies, or sky.

6.2.16.6 Conclusion

Based upon a review of the project and proposed buffer mitigation, the Segment 27 upgrade should not unreasonably interfere with existing scenic and aesthetic uses of scenic resources within its viewshed and should not have an unreasonable adverse effect on the scenic character of the surrounding area.

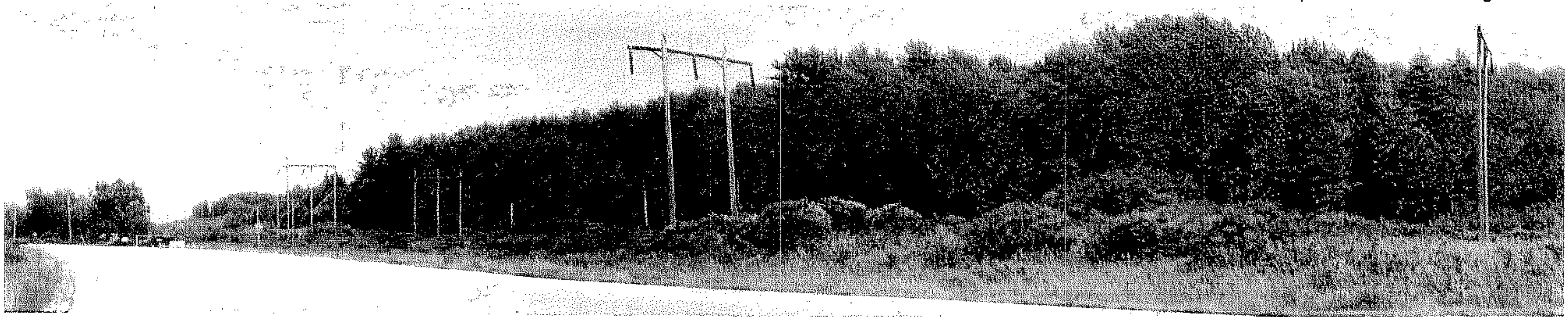
6.2.17 SEGMENT 29

Segment 29 (3.21 miles) involves the separation of two 345 kV transmission lines currently located on lattice structures between the junction of Segment 11 (1,400 feet north of Old Stage Road in Woolwich) and the Maine Yankee Substation in Wiscasset. This segment is located in the towns of Woolwich and Wiscasset.

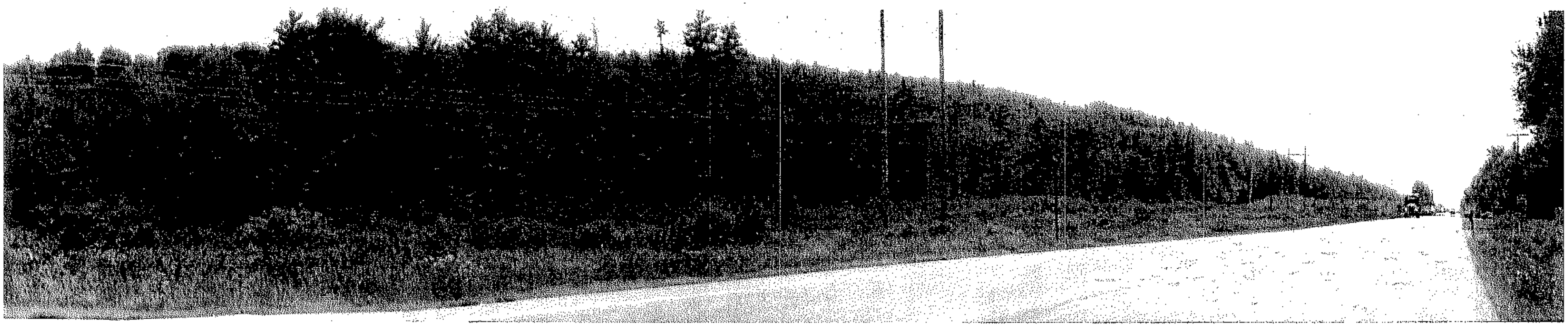
The northern portion of Segment 29 (approximately 1.7 miles in length) currently has three 345 kV transmission lines and two 115 kV transmission lines located on three sets of lattice structures in a 550± foot-wide cleared transmission line corridor. Both of the 115 kV transmission lines and two of the 345 kV transmission lines are located on double-circuit lattice structures. This portion of Segment 29 will include the relocation of one of the 345 kV transmission lines to new H-frame structures on the east side of the transmission line corridor and the clearing of an additional 100± feet of capable vegetation on the east side of the transmission line corridor.

The middle portion of Segment 29 (approximately 0.4 miles in length) currently has four 345 kV transmission lines and two 115 kV transmission lines located on three sets of lattice structures and one set of H-frame structures in a 550± foot-wide cleared transmission line corridor. Both of the 115 kV transmission lines and two of the 345 kV transmission lines are located on double-circuit lattice structures. This portion of Segment 29 will include:

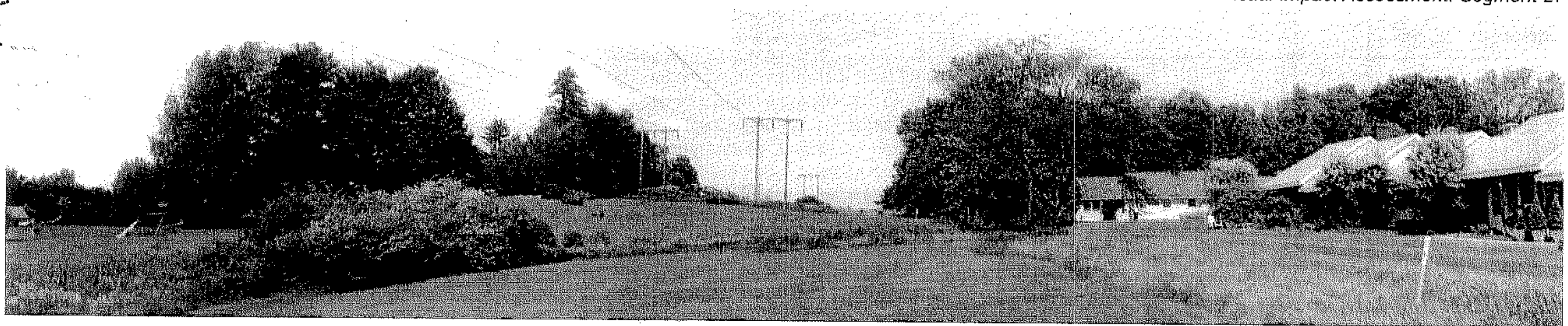
- Replacement of the 115 kV lattice structures with single pole double-circuit structures at the western edge of the transmission line corridor.
- Construction of a new set of H-frame structures to support one of the 345 kV transmission lines that are currently on the lattice structures.



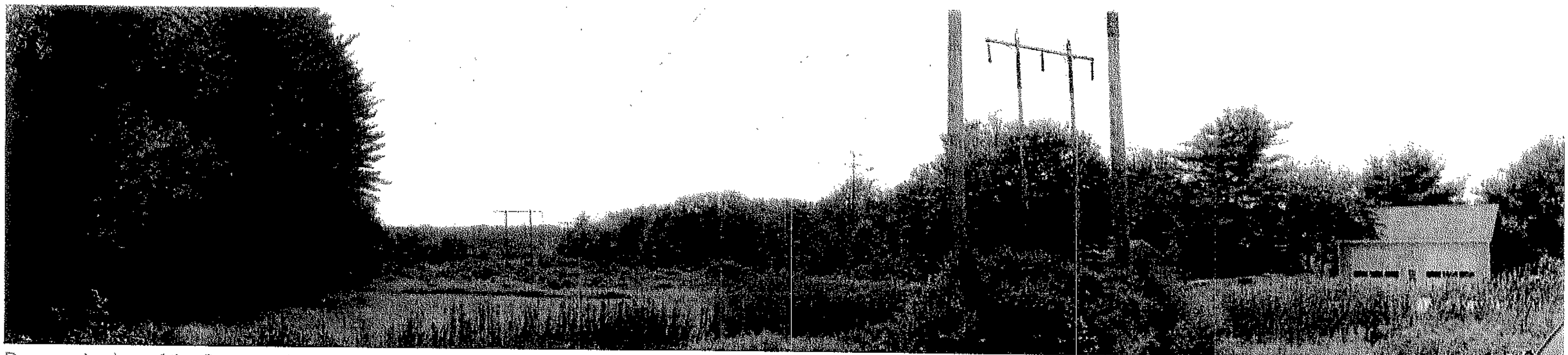
Panoramic view of the Segment 27 transmission corridor looking northeast from Route 236 (Harold Dow Highway) in South Berwick. The Section 197 upgrade, replacing the H-frame transmission structures on the west side (closer transmission line in photo) of the corridor with single pole transmission structures (typically 75'± tall) had not been completed when this photo was taken. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (far side in photo) with single pole transmission structures (typically 75'± tall) and constructing a 345 kV transmission line (with H-frame transmission structures typically 75'± tall) on the east side of the existing corridor (on far side in photo). No additional clearing should be required.



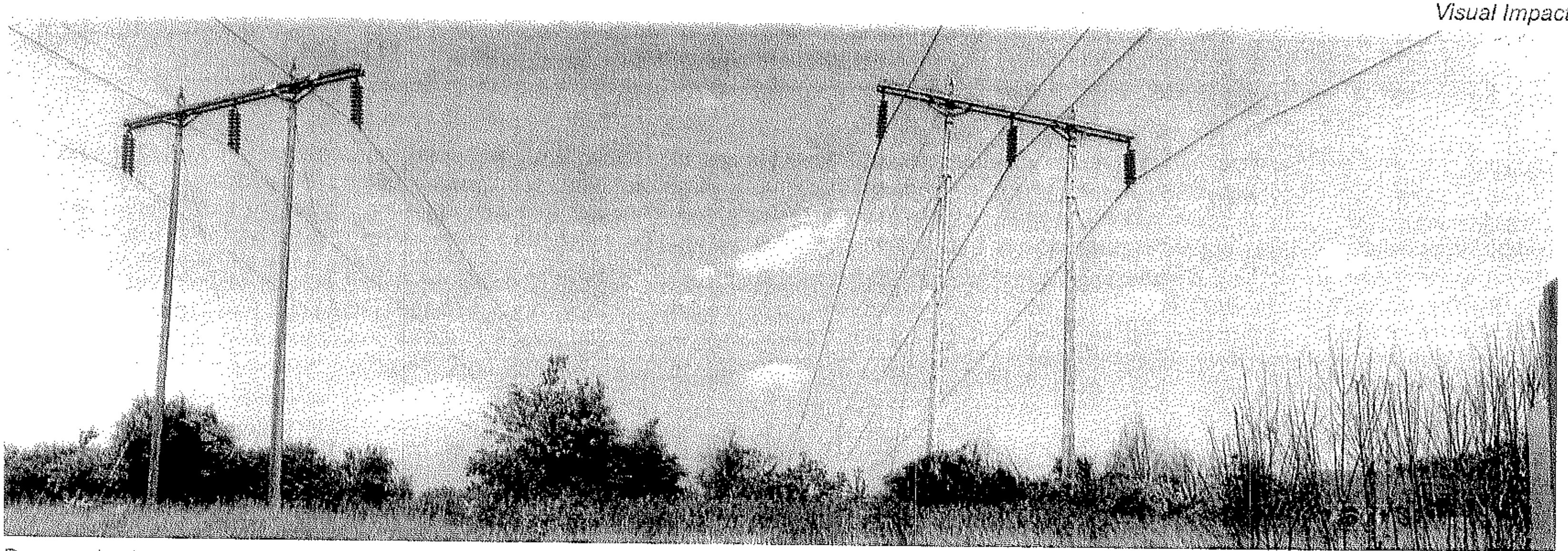
Panoramic view of the Segment 27 transmission corridor looking southwest from the same location in South Berwick. The Section 197 upgrade, replacing the H-frame transmission structures on the west side (closer transmission line in photo) of the corridor with single pole transmission structures (typically 75'± tall) had not been completed when this photo was taken. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (far side in photo) with single pole transmission structures (typically 75'± tall) and constructing a 345 kV transmission line (with H-frame transmission structures typically 75'± tall) on the east side of the existing corridor (on far side in photo). No additional clearing should be required.



Panoramic view of the Segment 27 transmission corridor looking northeast from the Woodland Hills road (southern portion of the loop road) in South Berwick. The Section 197 upgrade has replaced the H-frame transmission structures on left side of the corridor with single pole transmission structures. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (center in photo) with single pole transmission structures (typically 75'± tall) and constructing a 345 kV transmission line (with single-pole transmission structures typically 95'± tall) on the east side of the existing corridor (right of center in photo). No additional clearing should be required.



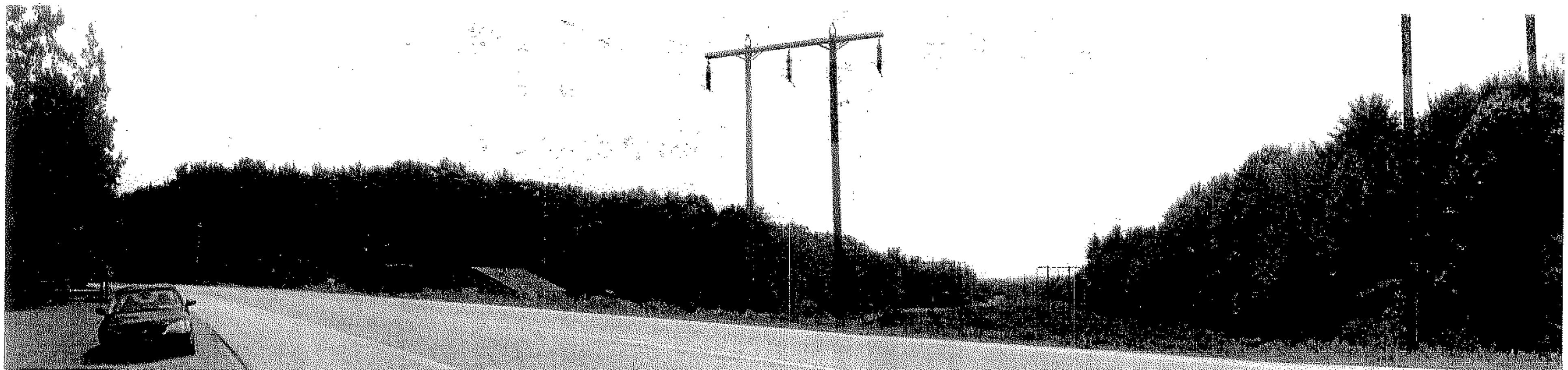
Panoramic view of the Segment 27 transmission corridor looking southwest from the same location in South Berwick. The Section 197 upgrade, replacing the H-frame transmission structures on the west side (right in photo) of the corridor with single pole transmission structures (typically 75'± tall) had not been completed when this photo was taken. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (center in corridor) with single pole transmission structures (typically 75'± tall) and constructing a 345 kV transmission line (with single-pole transmission structures typically 95'± tall) on the east side of the existing corridor (left in photo). No additional clearing should be required.



Panoramic view of the Segment 27 transmission corridor looking northeast from Route 101 (Goodwin Road) in Eliot. The Section 197 upgrade, replacing the H-frame transmission structures on the west side (left in photo) of the corridor with single pole transmission structures (typically 75'± tall) had not been completed when this photo was taken. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (right in photo) with single pole transmission structures (typically 75'± tall) and constructing a single pole 345 kV transmission line (typically 95'± tall) on the east side of the existing corridor (right in photo). No additional clearing should be required.

Panoramic view of the Segment 27 transmission corridor looking southwest from the same location in Eliot. The Section 197 upgrade, replacing the H-frame transmission structures on the west side (left in photo) of the corridor with single pole transmission structures (typically 75'± tall) had not been completed when this photo was taken. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (left of center in corridor) with single pole transmission structures (typically 75'± tall) and constructing a single pole 345 kV transmission line (typically 95'± tall) on the east side of the existing corridor (left of center in photo). Some removal of capable tree species within the existing corridor may be required between the transmission line and commercial development on right in photo.

Panoramic view of the Segment 27 transmission corridor looking northeast from Route 236 / 103 (Harold Dow Highway) in Eliot. The Section 197 upgrade, replacing the H-frame transmission structures on the west side (center in photo) of the corridor with single pole transmission structures (typically 75'± tall) had not been completed when this photo was taken. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (right in corridor) with single pole transmission structures (typically 75'± tall) and constructing a single pole 345 kV transmission line (typically 95'± tall) on the east side of the existing corridor (right in photo). Some removal of capable tree species within the existing corridor may be required.



Panoramic view of the Segment 27 transmission corridor looking from the same location in Eliot. The Section 197 upgrade, replacing the H-frame transmission structures on the west side (right in photo) of the corridor with single pole transmission structures (typically 75'± tall) had not been completed when this photo was taken. Proposed MPRP activities for Segment 27 will include replacing the remaining H-frame transmission structures (center in corridor) with single pole transmission structures (typically 75'± tall) and constructing a single pole 345 kV transmission line (typically 95'± tall) on the east side of the existing corridor (left of center in photo). No additional clearing should be required.

7.0 CONSTRUCTION PLAN

7.1 INTRODUCTION

The following construction plan provides an overview of the transmission line and substation construction techniques that will be implemented during construction of the Maine Power Reliability Program (MPRP). This plan is based on established transmission line and substation construction methods and is designed to minimize impacts to natural resources and expedite construction activities. Construction will be performed in such a manner that: 1) natural resources will be protected to the greatest extent practicable, 2) construction crews can safely install the transmission lines and build the substations, and 3) erosion will be minimized. Specific erosion control methods are discussed in the attached Erosion and Sedimentation Control Plan located in Exhibit 14-1 of the Site Law.

As a result, the project will not unreasonably interfere with natural water flow, violate any water quality law, or unreasonably cause or increase flooding. In addition, this plan helps to ensure there will be no unreasonable harm to wildlife habitats, including fisheries.

This plan focuses on the established transmission line and substation construction methods that will be employed when traversing uplands, waterbodies, and wetlands and clearing and building project components. This plan also provides for flexibility to allow application of the most appropriate construction methods based on site-specific conditions.

It is estimated that construction of the MPRP transmission lines and substations will take place over several years. For example, rebuilding a typical 10-mile transmission line segment takes about four months to complete.

7.2 TRANSMISSION LINE CONSTRUCTION

7.2.1 Construction Sequence

The construction contractor will generally follow the established transmission line construction sequence listed below. Each item listed is independently discussed in the following subsections.

- Establish construction yards and on-site staging areas;

- Complete the initial program "walk-through" with the environmental inspector, Third Party Inspector, engineer, and construction personnel;
- Plan and install erosion controls and access at protected resources such as waterbodies, wetlands, areas of saturated soils, and areas susceptible to erosion;
- Establish temporary short-term (typically eighteen months or less) and temporary longer-term (typically more than eighteen months) construction access ways;
- Clear canopy vegetation and perform grading as necessary to accommodate construction equipment;
- Move poles and materials to structure and laydown locations;
- Complete test digging/drilling at various pole locations;
- Install erosion controls at structure locations;
- Excavate structure holes;
- Install structures;
- Complete restoration and grading around the structures;
- Establish "pull-pad" locations and move tensioning and pulling equipment into place;
- Thread and install pull ropes, conductor, and fiber optic wire;
- Clip conductor and remove blocks;
- Complete the construction inspection, clean-up, and restoration, and then energize the line; and
- Complete the final program "walk-through" and restoration.

7.2.1.1 Establishing Construction Yards and On-site Staging Areas

The contractor will typically establish at least one principal working construction yard, office, and staging area in the vicinity of the ROW. This area is used to stage the bulk of construction materials such as poles, wire, and equipment and as a central point of communication. A secondary yard may be established to store some materials closer to their area of application and may serve as a landing site for helicopters. Site specific staging areas are established at strategic locations along the ROW, often where the line crosses county roads. These staging areas will be established away from protected natural resources.

7.2.1.2 Completing the Initial "Walk-Through"

Personnel from Central Maine Power (CMP), or a qualified representative, will walk the length of the transmission line with the contractor to identify critical areas where construction and construction access may be difficult due to terrain, wetland and water course conditions, or the location of protected or sensitive natural resources. Erosion control placement, access road layout, and wetland and stream crossing locations will be addressed, with avoidance and minimization of wetland impacts as a priority. The type and location of erosion controls as well as the approach to wetland and stream crossings will be determined at this time. Suitable access areas will be flagged with a specified color of surveyor tape, and "no-access" areas (such as some stream buffers) will also be marked using appropriate color-coded tape.

7.2.1.3 Planning the Installation of Erosion Controls and Access

Erosion controls will be installed as described per the "Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects" located in Section 14.0 of the Site Law application.

7.2.1.4 Establishing Temporary Construction Access Ways

Temporary Shorter-term Access Ways (typically eighteen months or less)

Temporary access ways will be established within the ROW to provide construction equipment access to the structure locations. This will be an ongoing process as access will be established to areas undergoing immediate construction. As construction progresses, new access ways will be established and obsolete ones will be discontinued.

During frozen ground conditions without snow, paths will be designated and temporary bridges will be constructed to cross streams. During frozen ground conditions, access through most wetlands can be completed without the use of mats. All stream crossings must be completed using construction mats. Construction mats, either timber or fiberglass composite, will be used in areas where the ground is not sufficiently frozen to support equipment. During winter construction with snow cover, packed snow paths ("snow roads") and ice paths will be created to provide a solid surface for heavy equipment to traverse. The need for construction mats will be evaluated and discussed among the third-party inspector, CMP's inspector, and the contractor on a case-by-case basis.

During non-frozen ground conditions, construction mats will be utilized to cross wetlands with standing water and/or organic soils, as well as streams and other areas particularly susceptible to rutting and erosion. This may require extensive installation of mats. There may be instances where the third-party inspector, CMP's environmental inspector, and contractor conclude that mat installation, use, and removal would cause more disturbance than if no mats were used; in these cases, mats may not be used.

The typical use of construction mats to cross wetlands is depicted on Exhibit 7-1a located in **Exhibit 7-1** and in the photographs located in **Exhibit 7-8**. Cutting of non-capable vegetation, such as shrubs, in wetlands will be limited to those areas necessary for safe access. In these areas cutting will be selective. It is a priority to lay construction mats on top of shrub vegetation. No extensive grubbing (grading to remove root systems) within wetland crossing areas will be done prior to mat placement. However, some minor grading may be required to ensure mat stability and construction access safety. All such grading will be performed on a limited basis and only with prior approval by CMP's environmental inspector.

Temporary bridges will be used to cross streams regardless of site conditions. Temporary bridges can be created using construction mats, typically timber mats (See example stream crossing using equipment mats in **Exhibit 7-2**). Appropriate erosion controls will be installed wherever necessary. If necessary, mats will be placed parallel to the upland edge as abutments to further protect bank stability and establish stability. Streams that are too wide to cross with construction mats or temporary bridges will be avoided.

Temporary Longer-term Access Ways (typically more than eighteen months)

On occasion, longer-term access ways will be needed for constructing portions of the MPRP. These paths will need to be sufficiently stable to provide access for heavy equipment including concrete trucks needed to pour concrete for structure foundations. In wetlands, the path will consist of the following options:

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- Geo-textile fabric overlain with wood construction mats installed perpendicular to the path of travel. See **Exhibit 7-1**, Figure 7-1b for a typical depiction of this type of temporary, longer-term access path;
- Geo-textile fabric overlain with clean rock and gravel fill with occasional culverts installed for cross drainage in areas with, or with the potential for, surface flow through wetlands. This option will be used on a limited basis and will only be employed when the construction mat option is not possible or desirable due to soil conditions, hydrology, etc. See **Exhibit 7-3** for a typical cross section of this type of longer-term access path.

To the extent possible, these paths will be installed on existing all terrain vehicles (ATV) and other unimproved trails that are currently located in and along the MPRP corridor. Construction of these access ways will require occasional clearing of heavy shrub growth and grading (only in uplands) for safe access; however, the amount of grading required will be minor and will be limited to uplands.

These longer-term access ways have been designed to avoid and minimize temporary wetland and stream impacts. When possible, CMP will also seek to obtain permission to use private, off-ROW access roads that may enable the contractor to further avoid certain streams and wetlands. If streams cannot be avoided, temporary crossings (see example in **Exhibit 7-4**) consisting of the necessary number of culverts (to be determined in the field) underlain by geo-textile fabric will be constructed. Clean rock and gravel fill will be placed on the fabric and around the culvert(s) to produce a stable, safe temporary crossing. No grubbing within wetland and/or stream crossing areas will be done prior to installation of the path. If there is high surface water flow within some wetlands, cross culverts may be installed to enable water to flow from one side of the access path to the other. Within the construction corridor itself, these paths have been designed to cross wetlands at their narrowest or driest points.

All temporary longer-term access ways will be removed from all water resources (including wetlands and streams) following the completion of construction activities. The only exception to the above statement is stream crossing areas that are later identified for the installation of viable ford crossings. These ford crossings would be left in place to help reduce ATV associated damage to stream resources along this new line. In addition, all pre-construction contours and drainage ways will be restored to the maximum extent practicable; therefore, all wetland and stream impacts associated with the new heavy-duty access path are considered temporary. In general, heavy equipment such as excavators will be used to move soil and rocks in order to re-shape the ground to achieve pre-construction contours. These areas will then be seeded (if necessary) and stabilized with straw mulch or a thin layer of erosion control mulch.

It is important to note that the use of longer-term access ways will be limited as the vast majority of the proposed MPRP will be constructed using wooden H-frame structures, which do not require concrete foundations or footings.

Approximately 8.8 acres of wetlands impacts were estimated for long-term temporary (> 18 months) access ways using assumptions regarding construction schedules and proposed access to the transmission ROW. The use of long-term temporary access roads will be required in areas where mats are ineffective or unusable, such as high organic or muck soils with high water content. Defining a specific acreage is difficult as wetland crossings (not streams) based on field conditions are variable, the construction schedule is dynamic, and alternate access routes continue to be evaluated for constructability. Constructability reviews are necessary to ensure that the access routes selected are feasible and to determine if less damaging access can be identified on the ground. CMP requires its construction contractor(s) to minimize disturbances to sensitive areas, including the use of long-term temporary access roads in such areas. To limit long-term temporary access road disturbance to 8.8 acres and to minimize disturbances to sensitive areas, CMP will:

1. Require the contractor to use matting where practicable.
2. Maximize construction during frozen ground conditions when practicable.
3. Identify that a total of not more than 8.8 acres will be available for long-term temporary access roads in the contract and require the contractor not exceed that amount.
4. Work with the contractor(s) to identify alternate routes that minimize the need for long-term temporary access through delineated wetlands.
5. Require the contractor(s) to remove construction mats when there is a significant time lag between construction phases and store the construction mats in adjacent upland areas.

CMP will have construction environmental inspectors on-site throughout the project to monitor and document the locations, timing and methods used for long-term temporary access roads.

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7.2.1.5 Clearing Canopy Vegetation and Grading

Some of the MPRP transmission line corridor will require limited additional clearing, which will be done in accordance with the "Resource Specific Construction Mitigation Measures" provided in Section 10 of the Site Law application.

Danger trees will also be identified and cut down at this time. "Danger trees" are dead, damaged, or dying trees located adjacent to the right-of-way itself that, due to their location, pose a risk of contact with the transmission line. Some danger trees may be within or adjacent to protected natural resources.

Construction of the MPRP will be performed in a wide array of vegetative cover. As in past CMP projects, the height of cover will dictate the type of structure site preparation needed. In general terms, vegetation less than approximately 30" high will require little structure site preparation. Typically, construction personnel will drive over the vegetation and perform their work. However, in wet areas where moderate to severe rutting could occur, mats will be needed to minimize or avoid unnecessary environmental impacts. In these areas, some vegetation treatment will be necessary in order to set the mats in place so that they are flat and provide a safe work platform. The vegetative treatment will remove the supersurface vegetative material to near ground level but will not impact the plant below the ground surface. Vegetative material removal may be performed using a grinding head, such as the "brontosaurus," attached to a small tracked vehicle, such as a Caterpillar Bobcat, or may be removed by hand, typically with a chainsaw. This approach allows for a safe work platform using a less environmentally damaging approach. This approach is preferred because it causes less environmental damage and promotes a more rapid regrowth than uprooting woody growth by driving over it, a danger that is exacerbated by wet soils.

Areas that have vegetation higher than 30" will require structure site preparation. As described above, vegetative material removal may be performed using a grinding head, such as the "brontosaurus," attached to a small tracked vehicle, such as a Caterpillar Bob Cat, or may be removed by hand, typically with a chainsaw.

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The area requiring site preparation will vary by structure type. Basically, there will be four structure types used on the MPRP: wood H-frame, wood monopole, steel monopole and three-pole dead-end and angle structures. **Exhibit 7-10** depicts the variations on the four structure types and the necessary structure preparation area with the respective square footage for each type. Note that the shapes depicted are representative. The contractor will be restricted to the square footage depicted but the shape may vary based on need. The designs in **Exhibit 7-10** take into account the equipment needed to perform the work. As the members of the structures get larger, larger equipment is needed to perform the work. Also, larger structures require greater clearances. For example, a typical wooden 115 kV dead-end structure (EBR-1 on **Exhibit 7-10**) requires bucket trucks (approximately 50' long), cranes (approximately 40' long) and/or an excavator (approximately 20' long) for pole installation with clearance between outer conductors of 28 feet. Steel monopoles require much larger equipment and the use of concrete trucks (for pouring foundations) requiring stable roads and larger work pads.

In addition to structure site preparation, vegetative treatment will be required for installation of guy wires for most three-pole structures. Guy wires are used to provide additional support for the poles in high stress conditions. In most cases, the distance the guy anchors are set from the base of the pole is equal to the height of the lowest conductor arm above the ground surface, which typically will be approximately 60 feet. On heavy angle (greater then 75 degrees) steel monopole structures, the distance the guys anchors are set from the base of the pole is equal to the height of the static wire (topmost) above the ground surface, which typically will be approximately 100 - 120 feet. This additional work space will normally only be needed on one of the two outer poles. The guys for the remaining structures will be located in the work area prepared for the pole installation. Electric code requires that guy wires be grounded so a narrow lane between the guy wire anchor locations will require vegetative treatment to allow for installation of the counterpoise, or grounding wire.

In general, it is unlikely that extensive grading will be necessary. Grading may be required for stabilizing access roads, excavation sites, and pull-pad sites where terrain is uneven such that construction equipment access would not be safe without grading. Conductor pull-pad setup locations may require leveling by limited grading in an approximately 100-foot by 75-foot area

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to assure equipment stability. These sites will typically be located in uplands; if absolutely necessary; however, sites may be set up in wetlands using construction mats.

7.2.1.6 Moving Construction Materials in Place

Poles will either be hauled in by truck or skidder or flown in via helicopter. In areas where access is suitable (*e.g.,* level uplands near roads), trucks may be used. In areas with more difficult access, skidders may be used to bring the poles to the proposed pole locations. In very remote areas or if an accelerated schedule is being met, helicopter transportation may be used.

7.2.1.7 Completing Test Drilling

To determine if blasting will be required in order to set new poles, proposed pole placement locations may be pre-dug or drilled prior to a pole setting crew mobilizing to the area. Holes must be dug to a depth that is 10 percent of the pole length plus two feet. For example, an 85 foot pole requires a hole 8.5 feet plus 2 feet deep, or 10.5 feet in depth. If bedrock is encountered before the required depth for the placement of a specified pole is reached, blasting will be necessary.

7.2.1.8 Establishing Erosion Controls

As access to each structure site is completed and prior to the contractor commencing excavation, erosion controls will be installed per the direction of the environmental inspector, and will adhere to standards as described in Section 14 (Basic Standards Submissions) of the Site Law application. These controls are in addition to the controls established during the initial site walk. The locations of the erosion control devices will be marked using flagging tape or spray paint.

7.2.1.9 Excavating Structure Holes

Excavation for the structure holes will be completed using a backhoe. The contractor has a predetermined size and depth and location for each structure. De-watering of the hole during excavation may be necessary in areas with a high water table. Pole placement will permanently disturb an area of 8 to 10 feet by 10 feet; grubbing, if needed, will temporarily disturb an additional area of approximately 60 square-feet. Disturbance will be slightly greater in areas where angle poles are installed, due to the need to excavate for one or more guy wire anchors.

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Topsoil will be set aside for restoration and placed on the top of the spoil and spread out evenly around the base of the pole.

Although extensive blasting is not anticipated, some controlled blasting may be required if bedrock is encountered. If blasting is required, proper safeguards will be employed to protect personnel and property in the vicinity of the blasting. Blasting mats will be used to prevent shot rock from scattering. Pre-blast surveys are typically performed to identify the presence and condition of wells, personal property, and utilities in the vicinity. Blasting precautions will be the contractual responsibility of the contractor.

7.2.1.10 Installing Structures

Once a hole is prepared to the proper depth, a crane is used to place the pole in proper alignment. The construction crew aligns and plumbs each pole before filling the hole. The hole is filled with the spoil and is mounded up at the base of the pole and compacted. In wet areas, crushed rock is used to replace some of the soil. The spoil is removed and disposed of in an upland site, spread out, and mulched.

In areas where more than one pole is required (*e.g.*, specific transmission line designs and certain angle structures), the area of disturbance for the poles will overlap. Angle poles require guy wire anchor placement, which may slightly increase the area of disturbance around these locations.

For single pole structures, davit arms are attached before the pole is set in place. For structures with multiple poles, cross braces are hoisted into place using a crane; the braces are then affixed by workers climbing each pole. In each case, the insulators and blocks are subsequently attached.

The transmission line has been designed to site poles outside of wetlands to the maximum extent possible, but engineering limitations necessitate that some poles be placed in wetlands. In these cases, erosion controls will be used, grubbing will be kept to a minimum, and the disturbed areas will be restored to the original contour in order to maintain the original drainage and vegetation patterns.

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7.2.1.11 Restoration and Grading

Once poles are installed, construction crews will grade any disturbed areas and apply temporary erosion control. Disturbed areas in uplands are typically seeded and/or mulched with hay (or straw, if necessary). Areas in wetlands are not seeded and are mulched with straw for permanent restoration. Temporary erosion control in wetlands can be provided by applying straw over the exposed soil.

7.2.1.12 Establish Pull-pad Locations, Move Tensioning, Pull Equipment into Place

Pull-pads, often 100-feet by 75-feet, serve as level staging areas for installing pull ropes and conductor (see discussion below). The pull-pad sites vary in size and location, but are always directly underneath the location of the conductor. Pulling angles, the length of the conductor on the reels, the type of equipment required, topography, and access restrictions determine the locations and sizes of the pull-pads. These sites must be level to support the weight of the equipment; as such, some grading may be needed, as described in section 7.2.1.5 above. Where soils are saturated or soft, construction mats will be used for stability. Should extreme conditions be encountered, on-site consultation will be performed with the third party inspector prior to locating any portion of a pulling or tension set-up in or near a protected natural resource.

The pullers and tensioners are typically mounted on large, flat bed-type tractor-trailer rigs, and can weigh in excess of 80,000 pounds. They frequently also need to be anchored by large bulldozers. For this program, sufficient upland areas exist to site the conductor pulling and tensioning setup areas.

7.2.1.13 Installing Pull Ropes, Conductor and Tensioning

The conductor installation process involves three basic steps. A polypropylene line is first pulled through blocks on the insulators by using a helicopter or by workers on ATV's. A steel pulling wire connected to the polypropylene line is pulled from the conductor puller. The conductor puller then pulls the conductor through the blocks and the tension is set on the far end of the pull by equipment called a tensioner. Conductor pullers and tensioners require a large, level area for their setup as discussed in **Section 7.2.1.12** above.

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7.2.1.14 Clipping Conductor and Removing Blocks

Clipping the conductor involves removing the wire from the blocks and permanently clipping it in place at the bottoms of the insulators. There are three approaches applied: workers access each pole on foot and climb the poles to clip the wires; workers clip wires from bucket trucks; or workers access the poles from a helicopter. The bucket truck access requires that crane mats remain in place or are repositioned to support the equipment. There is a temporal lag between pole installation and clipping where mats may have been removed after installation and need to be brought back for clipping. Use of the bucket truck is the preferred method because it is generally more efficient for clipping than climbing the poles. Depending on the program schedule and access difficulties, workers can be flown in by helicopter, eliminating the need for access by the bucket trucks.

7.2.1.15 Completing the Construction Inspection and Energizing the Line

After wire is pulled and clipped into place, a construction inspector checks the newly installed line for construction deficiencies. Any deficiencies that are found during the final construction inspection will be fixed by a construction "clean-up" crew. These crews typically require limited use of heavy equipment, and reach program poles from the construction access road on foot. Impacts from these crews will be minimal to none. Once engineers have determined that the transmission line is in place and conductor is connected at each substation, the line is energized and brought into service.

7.2.1.16 Completing the Final Restoration and Walk-Through

The construction access travel paths and conductor-pulling setup locations within wetlands will be restored as closely as possible to pre-construction conditions. Contours and drainages will be restored. Disturbed wetland soils will be mulched with straw for final restoration in accordance with the CMP Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects (December 2007). This manual is located in Exhibit 14-1 of Section 14 of the Site Law Application. Upland areas not adjacent to wetlands and streams are sometimes seeded with a suitable annual seed mix and mulched with hay. Often seeding will not be necessary as upland and wetland vegetation typically reestablishes quickly. Excess construction debris (litter, hardware, bracing) will be removed from the ROW and

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disposed of at a licensed recycling or solid waste disposal facility. No materials will be burned or buried on the ROW. Erosion and sedimentation controls will be installed as needed and maintained through the duration of the restoration efforts. These devices will be removed once the area has enough vegetation stabilizing the area. Also, see the Restoration Plan (Exhibit 14-1) of the Site Law Application.

CMP personnel and/or qualified representative(s) will walk through the completed program and check for any potential erosion problems or areas that require further restoration to pre-existing conditions. Any problem areas will be permanently stabilized.

7.3 SUBSTATION CONSTRUCTION DETAIL

7.3.1 Construction Overview

Construction of the substation and installation of the required wiring and equipment will generally consist of the steps listed below.

- Installation of erosion and sedimentation controls;
- Clearing and rough earthwork to prepare the construction area;
- Establish the construction pad to include the grounding mat, gravel, and crush stoned base;
- Establish the new entrance road, if needed, and complete the final grading for the site footprint;
- Construction of the stormwater management areas;
- Placing concrete foundations;
- Construction of structures and electric equipment;
- Installation of the new fence;
- Final electrical installation and testing;
- Connection of electrical lines to new equipment, and energizing of the new equipment (commissioning); and
- Complete site stabilization and permanent restoration.

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7.3.1.1 Installation of Erosion and Sediment Controls

Erosion control measures will be installed prior to the initiation of any construction or grading activities. Sediment barriers (*i.e.*, erosion control mix, hay bales, and/or silt fences) will be installed between wetlands/waterbodies and all disturbed areas unless land contour conditions slope away from these resources. All erosion control measures will be routinely inspected and maintained throughout the duration of construction to ensure that they are functioning properly. Any measures that appear to be failing will promptly be corrected and/or replaced.

7.3.1.2 Clearing and Earthwork

Construction roads will be established to each new substation. For substation expansion sites existing entrance roads will be used as appropriate. Some entrance roads may not be suitable and either will need to be upgraded or new roads constructed. The new road will be graded, filled, and drainage established and put into service. At this time final grading will be completed and the next phase of the construction can be completed.

Earthwork will be required to accommodate the proposed substation construction and expansion. This will involve the use of heavy equipment including excavators, bulldozers, and dump trucks to grub the proposed zone of expansion and place clean fill. The limits of the proposed work zone will be clearly staked before the commencement of earthwork activities. Although blasting is not anticipated, some controlled blasting may be required if bedrock is encountered. If blasting is required, proper safeguards will be employed to protect personnel and property in the vicinity of the blasting (reference Section 20 of the Site Law Application). Blasting mats will be used to prevent shot rock from scattering. Pre-blast surveys are typically performed to identify the presence and condition of adjacent wells, personal property, and utilities in the vicinity. Blasting precautions and code compliance will be the contractual responsibility of the contractor.

Areas with vegetation, such as forested upland and wetland areas, will be cleared and grubbed. Trees and shrubs will be disposed of or chipped on site, consistent with the Maine Slash Law. The site will be graded and fill added as needed to build the site up to the necessary elevations to establish drainage and a level building surface.

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7.3.1.3 Construct Stormwater Management Areas

Components of the stormwater management system will be graded and established as site grading is completed. Drainage will be maintained and culverts installed as needed.

7.3.1.4 Concrete Foundation Placement

Concrete foundations will be installed (either precast or cast in place) to create pads for the new substation equipment. These concrete pads will be constructed to engineering specifications and will not cause erosion and sedimentation issues.

7.3.1.5 Fence Installation

Following the completion of earthwork and placement of the concrete pads, a new chain-link fence will be installed around the perimeter of the substation. This fence will be the standard fencing (eight feet tall with three strand barbed wire pitched at a 45 degree angle) found at other CMP substations.

7.3.1.6 Electrical Equipment Installation and Energizing

The bulk of the electrical equipment including transformers, termination structures, switchgears, circuit switchers, regulators, re-closers, and the control building will be installed after the main footings and structures are in place. All of this work will be completed within the substation footprint, or "fenced area."

7.3.1.7 Site Stabilization and Permanent Restoration

Disturbed soils within 100 feet of wetlands will be stabilized through mulching and establishing native vegetation in accordance with the CMP Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects (December 2007). Allowing native vegetation to regenerate naturally will be given the priority for establishing permanent vegetation. CMP's Environmental Inspector will work with the third-party inspector to identify areas that may require seeding. Upland areas not adjacent to protected resources will be allowed to re-vegetate naturally. Areas of exposed soils in uplands will be mulched with hay and those in wetlands will be mulched with straw. Any construction debris (litter, hardware, and

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bracing) will be removed from the site and disposed of at a licensed disposal facility. No construction debris or any other materials will be burned or buried at the project site. Erosion and sedimentation controls will be installed as needed and maintained through the duration of the restoration efforts. These devices will be removed once the area has a good catch of vegetation and is stable. Also, see the "Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects" located in Exhibit 14-1 of the Site Law application for complete restoration details.

CMP personnel and/or qualified representatives will examine the completed project site and look for any potential erosion problems or areas that require further restoration work. Any identified problem areas will be permanently stabilized as soon as possible.

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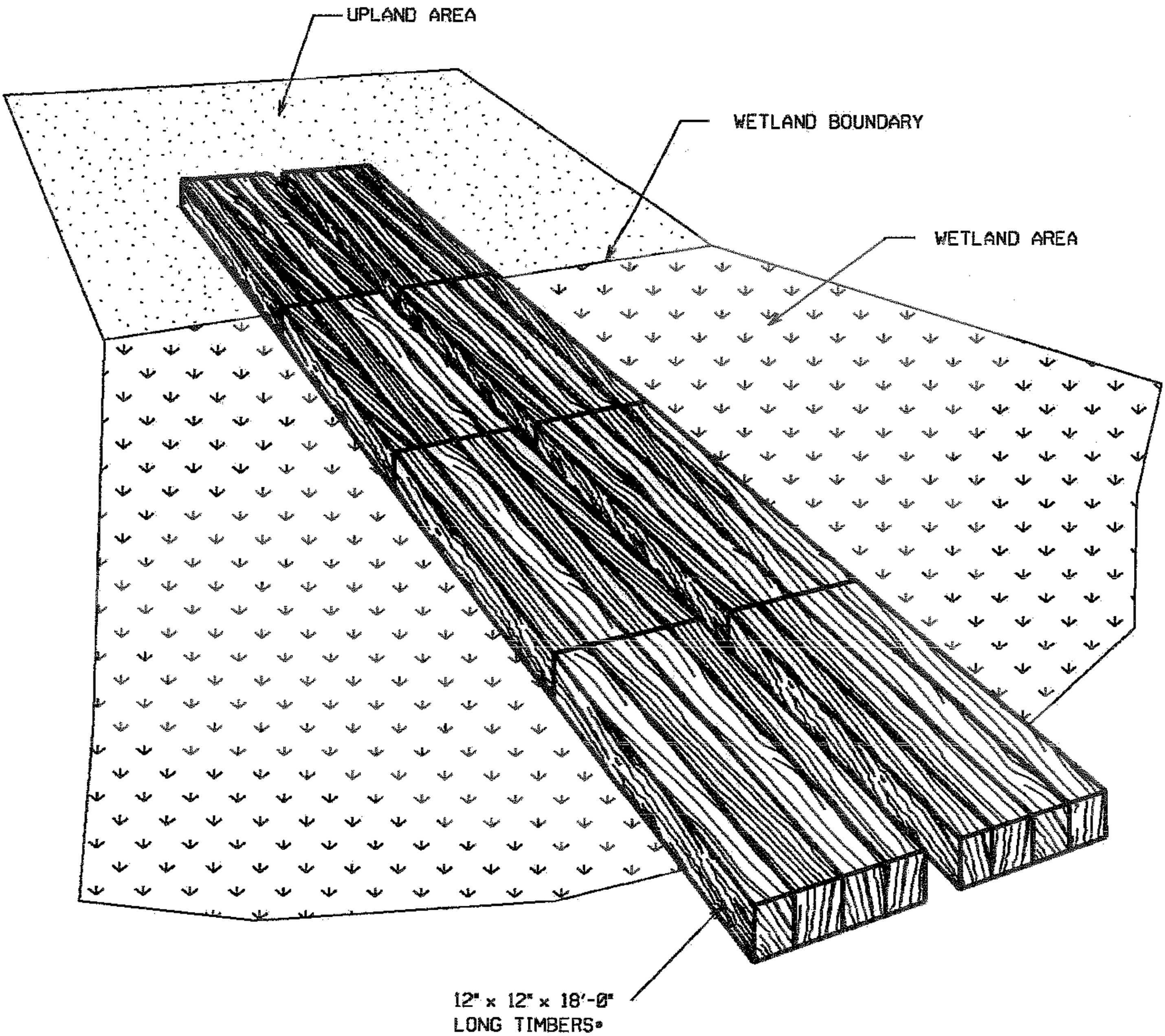
EXHIBIT 7-1

Temporary Timber Mat Paths



*MATS MAY RANGE IN SIZE AND MATERIAL COMPOSITION (WOOD OR COMPOSITE)

NOT TO SCALE

MAINE POWER RELIABILITY PROGRAM
A CENTRAL MAINE POWER COMPANY PROGRAM
WWW.MAINEPOWER.COM

CENTRAL MAINE POWER COMPANY

EXHIBIT 7-1a

TEMPORARY LIGHT DUTY TIMBER MAT PATH

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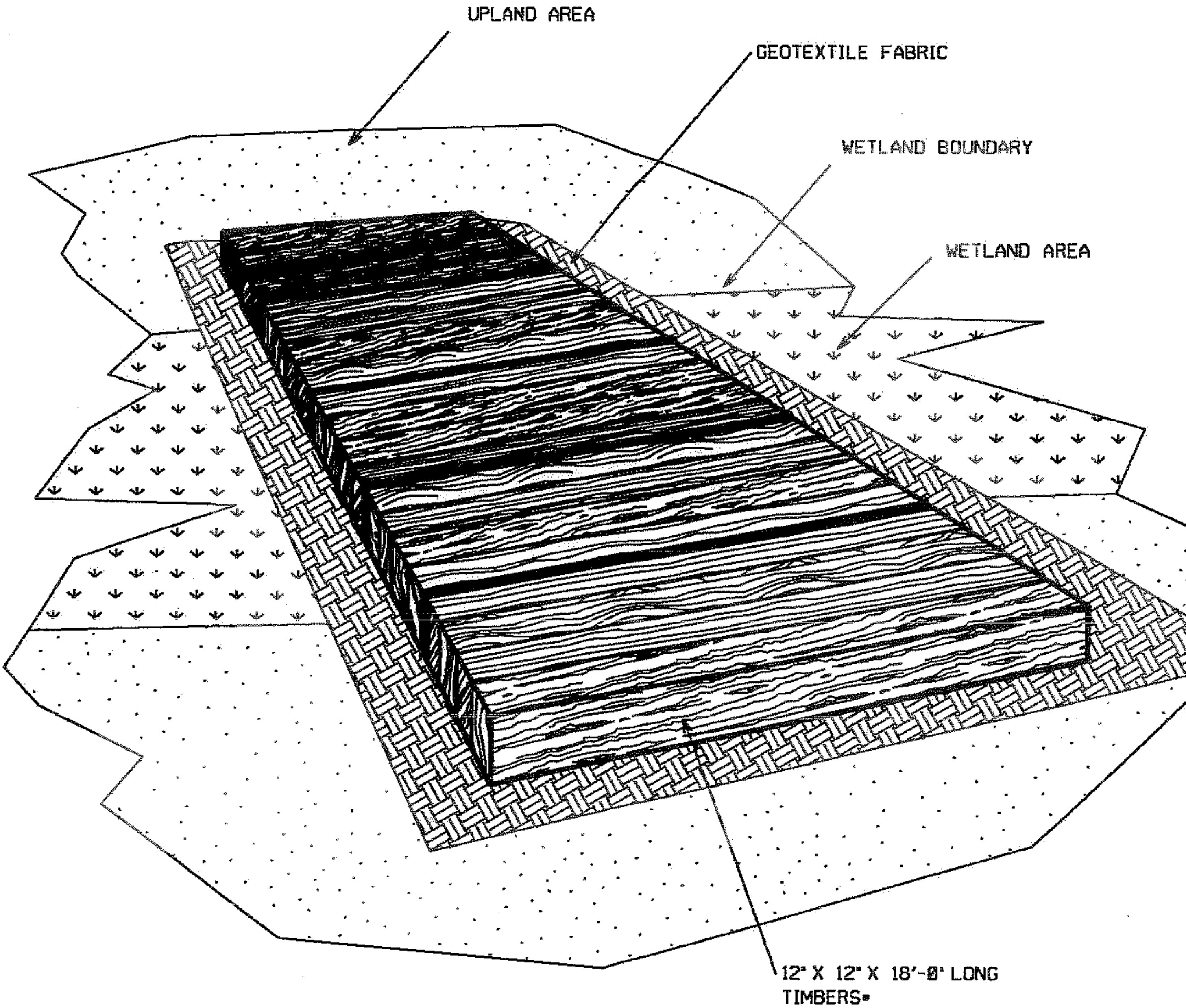

*MATS MAY RANGE IN SIZE AND MATERIAL COMPOSITION (WOOD OR COMPOSITE)

NOTE: THESE MATS WILL BE LEFT IN PLACE UP TO 18 CONTINUOUS MONTHS.

NOT TO SCALE

MAINE POWER RELIABILITY PROGRAM

A CENTRAL MAINE POWER COMPANY PROGRAM

WWW.MAINEPOWER.COM

CENTRAL MAINE POWER COMPANY

EXHIBIT 7-1b

TEMPORARY, MEDIUM TO HEAVY DUTY TIMBER MAT ACCESS WAY

EXHIBIT 7-2

Stream Crossing Using Equipment Mat Bridge (Typical)

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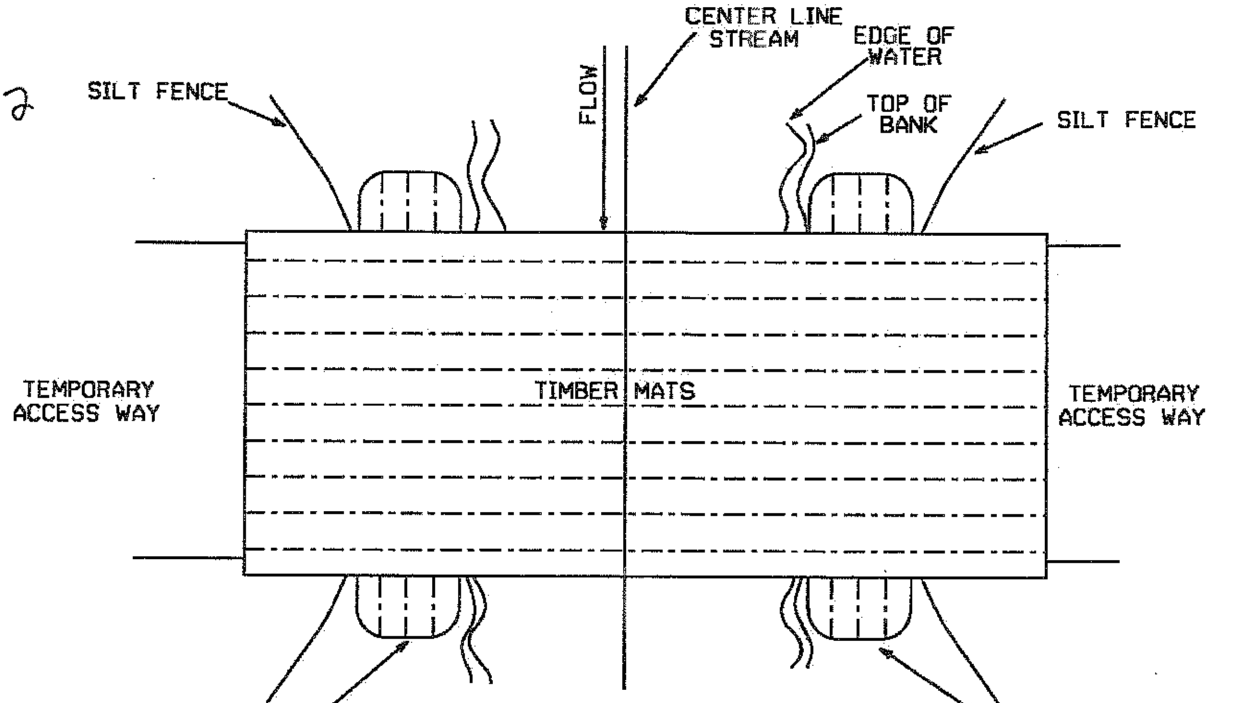
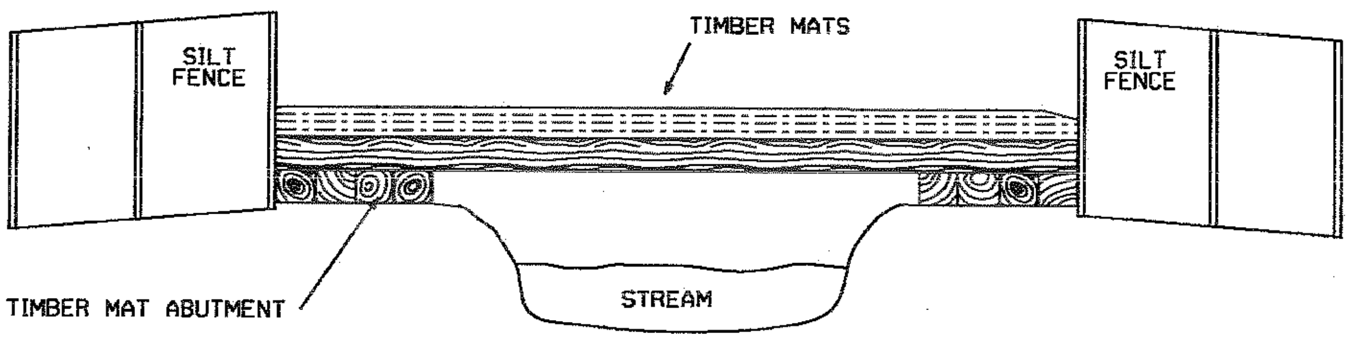


PLAN VIEW



ELEVATION

LIGHT DUTY ACCESS WAY - STREAM CROSSING

NOTE:

1) This type bridge is generally used for small stream crossings less than 10 feet in width in combination with a proper stream bank configuration.
2) Bridge will be temporarily removed if extreme high water conditions are anticipated.
3) Bridge to remain in place until the completion of final restoration.
4) Silt fence, staked hay bales, or erosion control mulch may be used interchangeably.

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EXHIBIT 7-2

STREAM CROSSING USING EQUIPMENT MAT BRIDGE (TYPICAL)

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EXHIBIT 7-3

Typical Use of Laydown Area for a Wood Pole Structure Installation

434

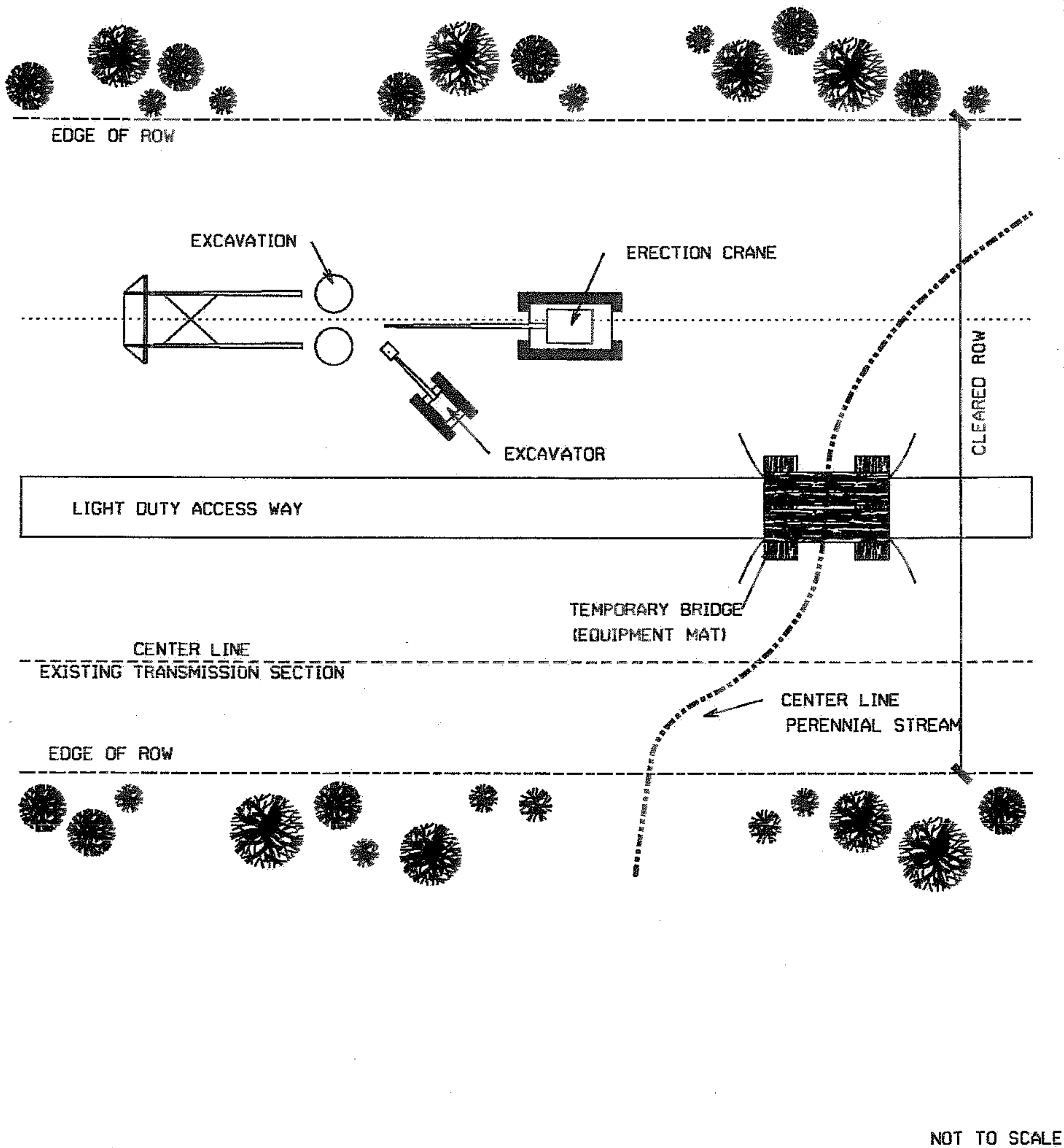

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EXHIBIT 7-3

TYPICAL USE OF LAYDOWN AREA FOR A WOOD POLE STRUCTURE INSTALLATION

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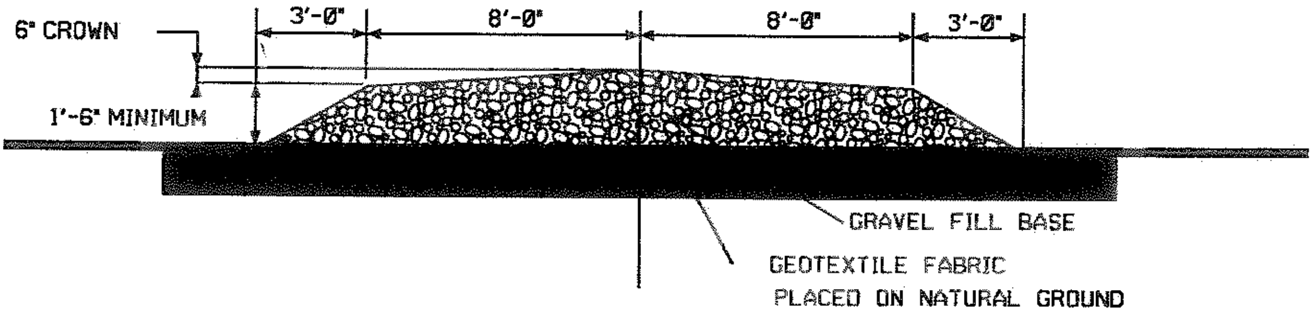
EXHIBIT 7-4

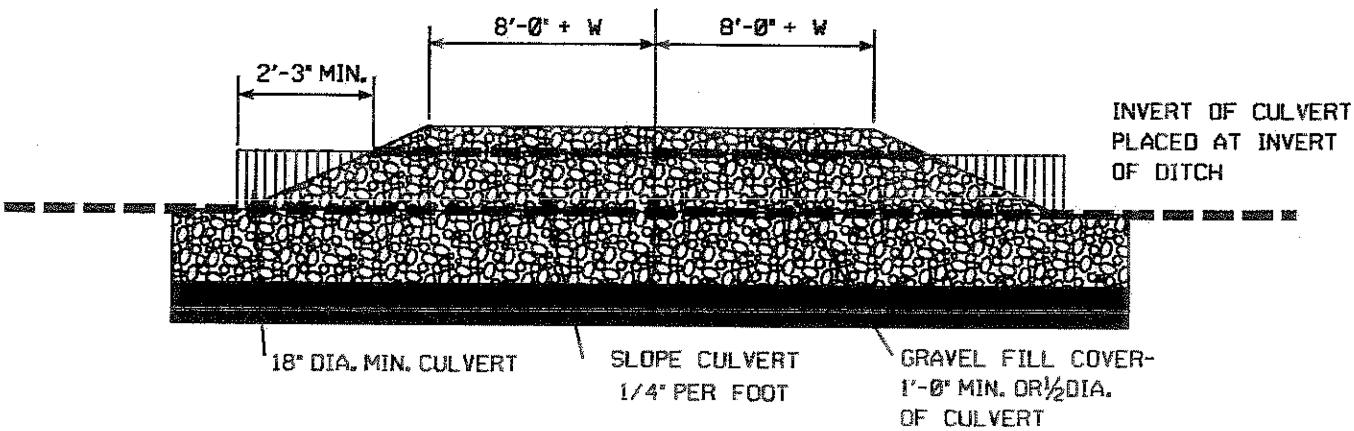
Longer-term Access Path (Geo-tech Fabric and Clean Gravel) and Culvert Details

43b



GRAVEL FILL ON GEOTEXTILE

(TEMPORARY IN WETLANDS)
(PERMANENT HEAVY DUTY IN UPLANDS)



CULVERT DETAIL

(TEMPORARY IN WETLANDS AND STREAMS)

TYPICAL HEAVY DUTY ACCESS WAY - WETLAND CROSSING

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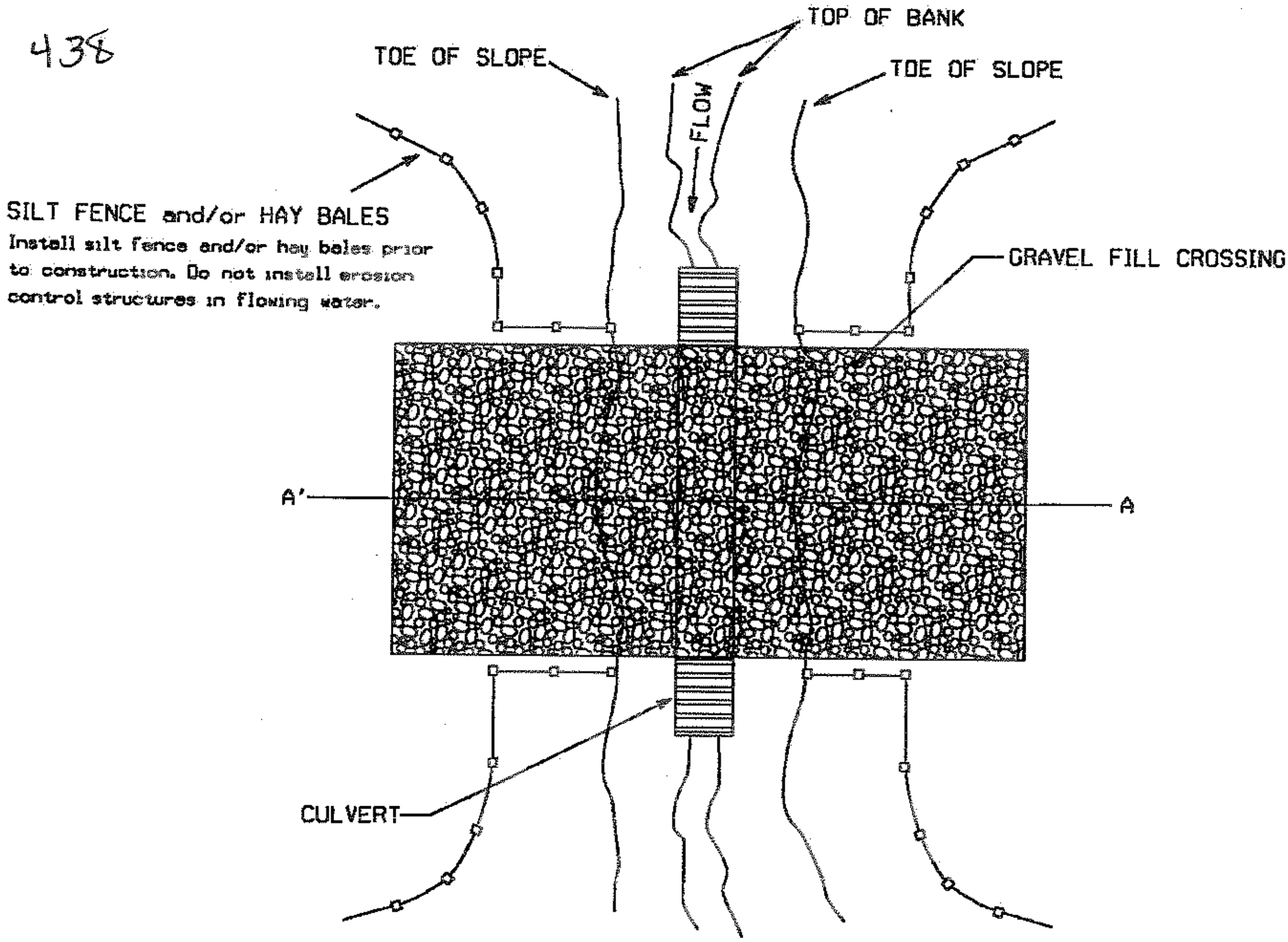
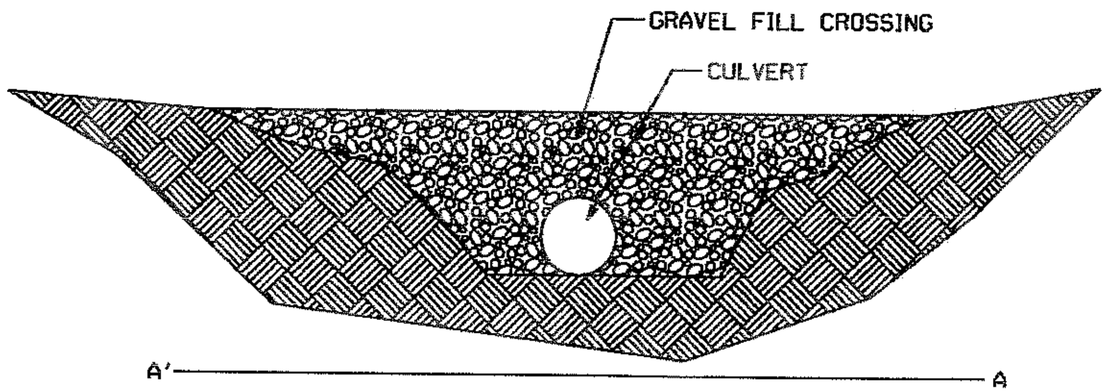
EXHIBIT 7-5

Longer-term Access Path (Typical) – Stream Crossing

438



PLAN VIEW



SECTION

NOTE: Number of culverts will be determined as necessary to provide unimpeded flows

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EXHIBIT 7-5

HEAVY DUTY ACCESS WAY (TYPICAL) - STREAM CROSSING

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EXHIBIT 7-6

Typical Use of Laydown Area for a Steel Pole Structure Installation

440

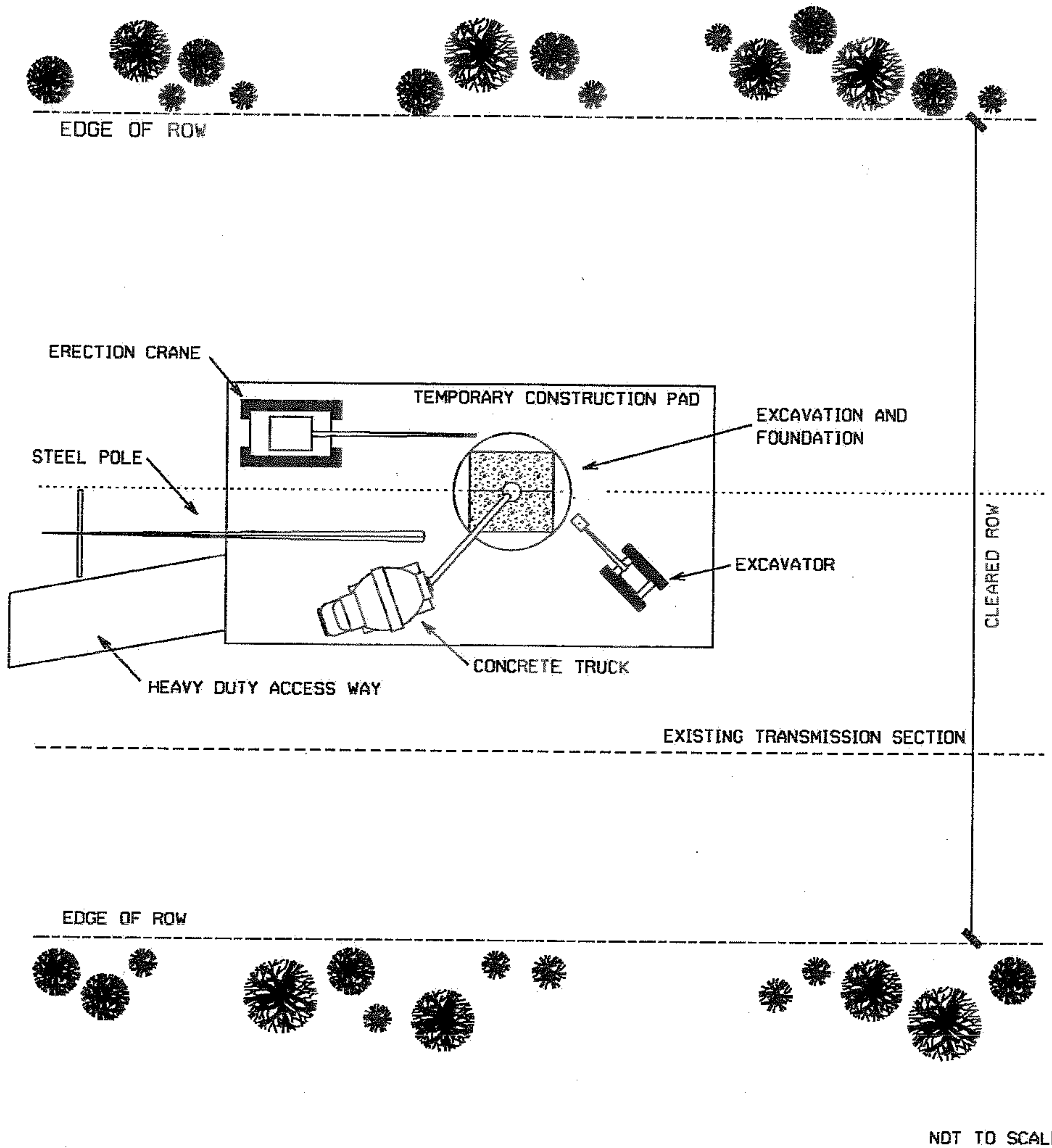

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EXHIBIT 7-6

TYPICAL USE OF LAYDOWN AREA FOR A STEEL POLE STRUCTURE INSTALLATION

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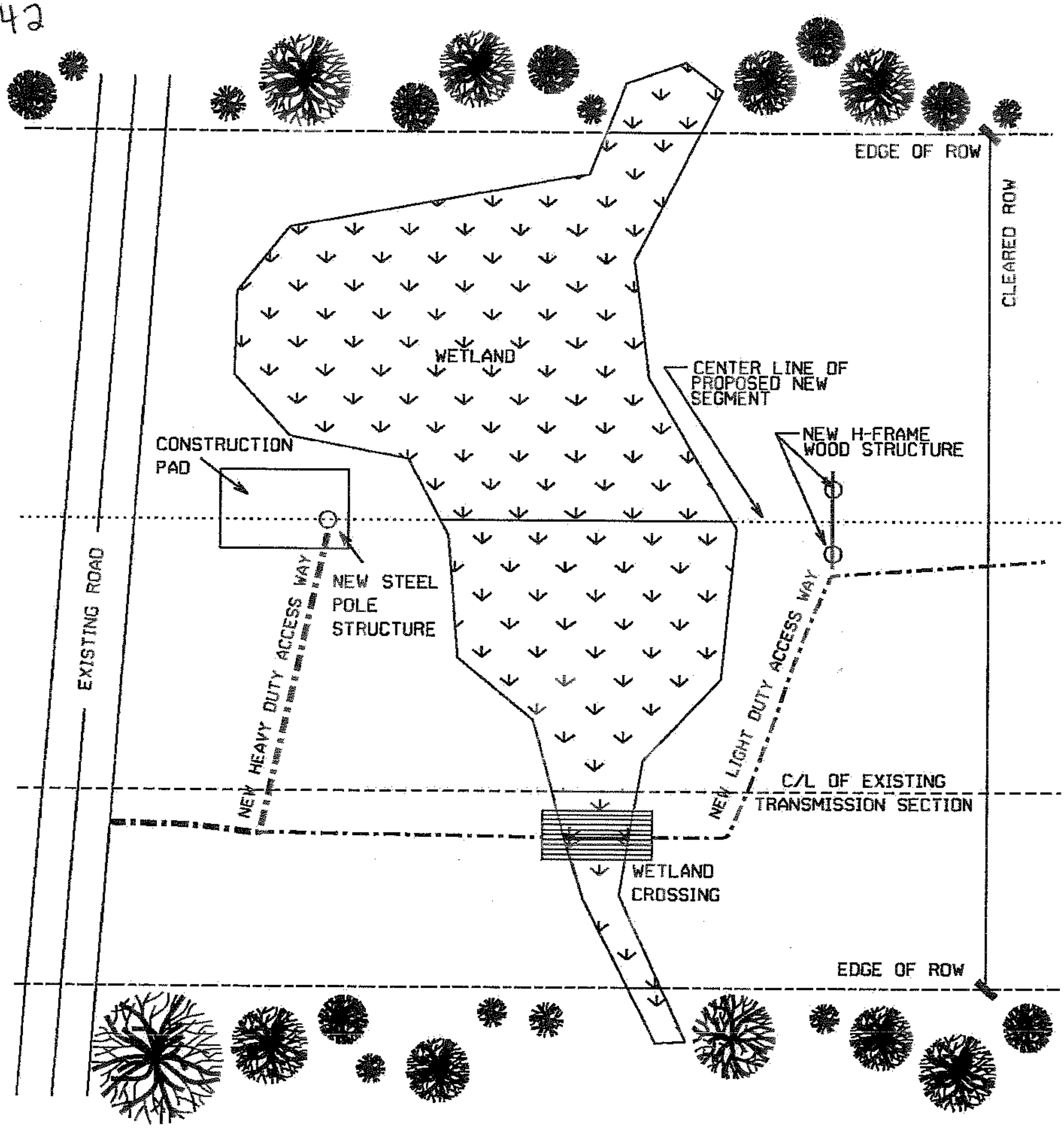
EXHIBIT 7-7

Example Plan Drawing of Light-and Heavy-Duty Access Ways

442



NOTE:

LIGHT DUTY ACCESS WAYS ARE TEMPORARY. HEAVY DUTY ACCESS WAYS ARE PERMANENT IN UPLANDS AND TEMPORARY IN WETLANDS.

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EXHIBIT 7-7

EXAMPLE PLAN DRAWING OF LIGHT- AND HEAVY-DUTY ACCESS WAYS

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EXHIBIT 7-8

Photos of Typical Equipment Mat Placement

444

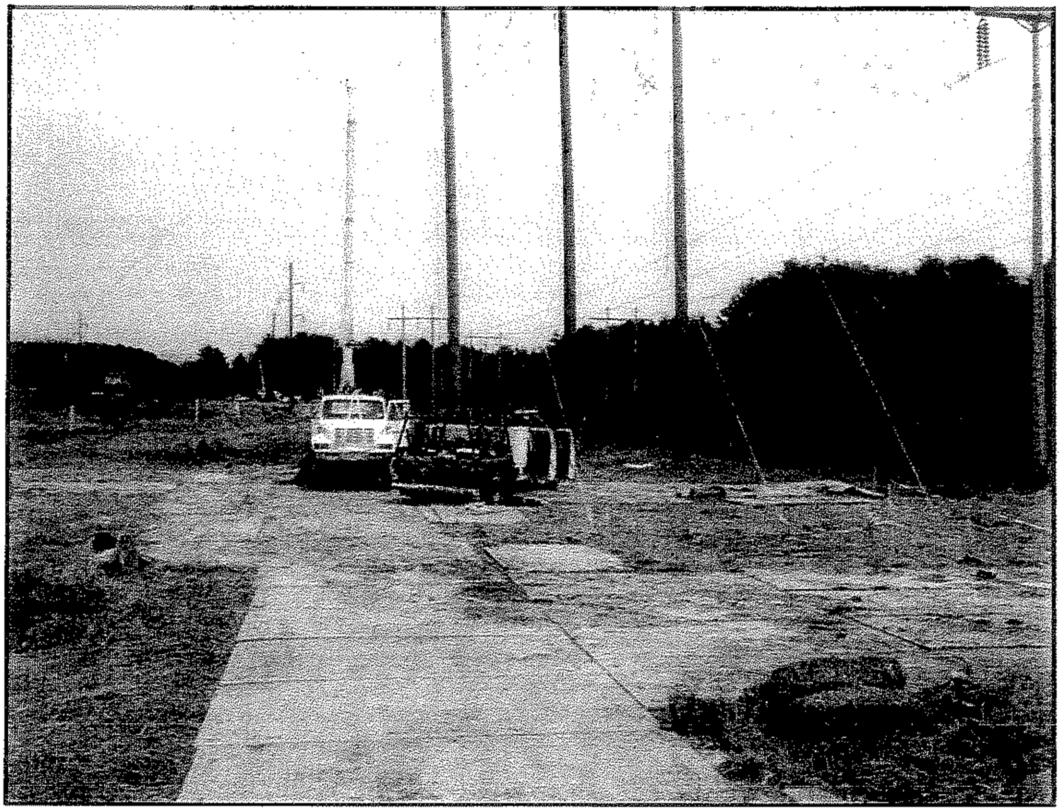

Photo 1: Matted work area used for triple pole installation site in wetlands

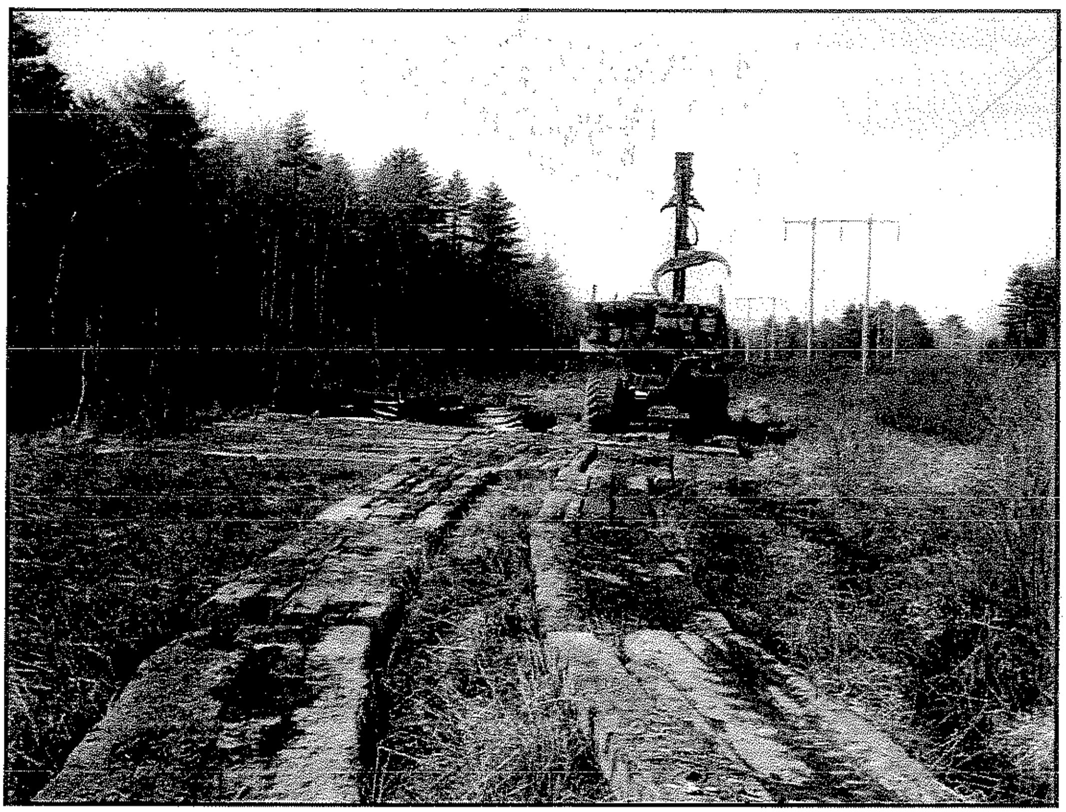

Photo 2: Timber mat access to a pole installation site in a wetland

EXHIBIT 7-9

Example of Stream Crossing Using Equipment Mats

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Photo 1: Overview of a timber mat bridge over a cold water stream

Photo 2: Timber mat bridge crossing of a small stream

Photo 3: Timber mat bridge being constructed over a perennial stream

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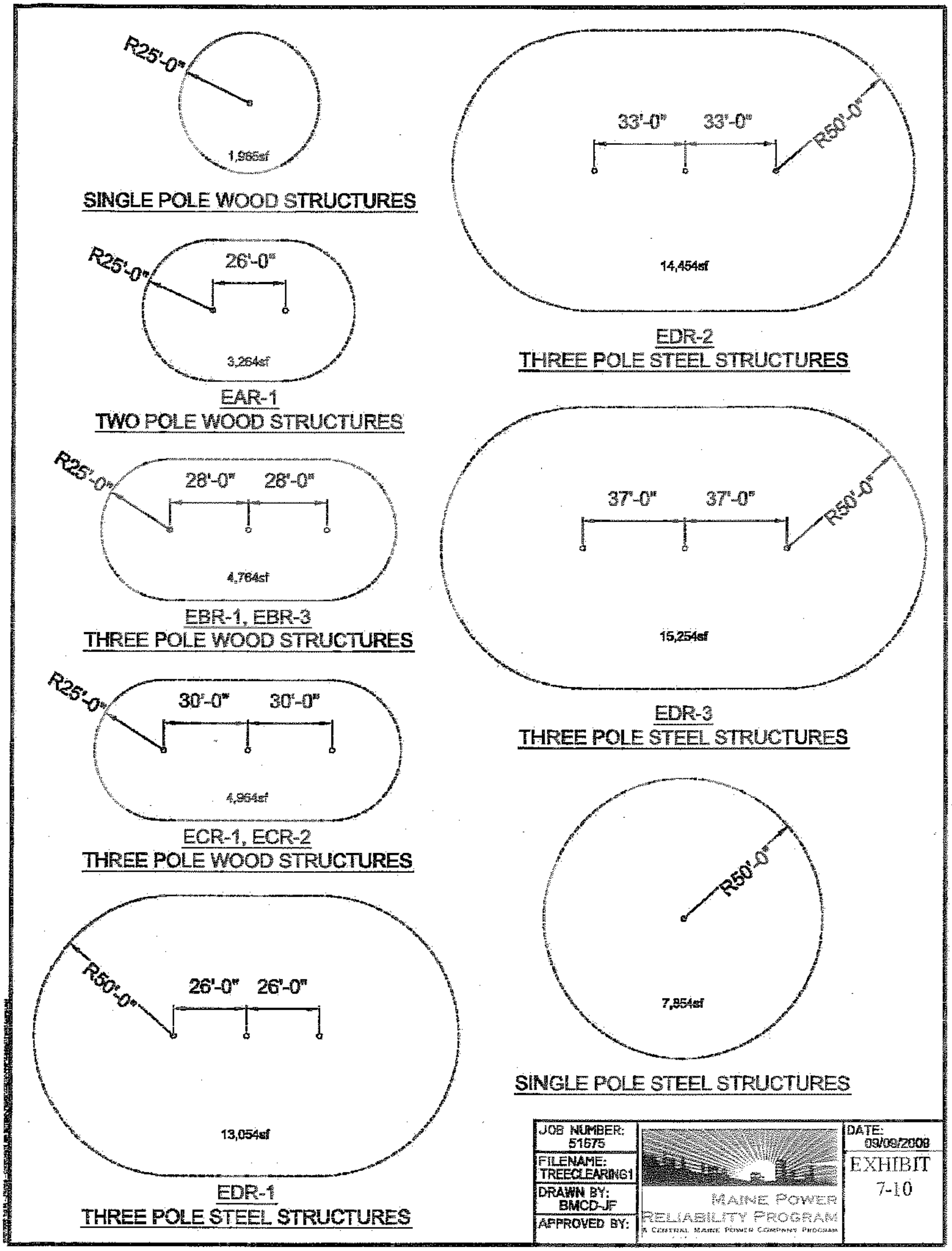
EXHIBIT 7-10

Structure Site Preparation


R25'-0"
1,965sf
SINGLE POLE WOOD STRUCTURES
R25'-0"
26'-0"
3,264sf
EAR-1
TWO POLE WOOD STRUCTURES
R25'-0"
28'-0" 28'-0"
4,764sf
EBR-1, EBR-3
THREE POLE WOOD STRUCTURES
R25'-0"
30'-0" 30'-0"
4,964sf
ECR-1, ECR-2
THREE POLE WOOD STRUCTURES
R50'-0"
26'-0" 26'-0"
13,054sf
EDR-1
THREE POLE STEEL STRUCTURES
33'-0" 33'-0"
R50'-0"
14,454sf
EDR-2
THREE POLE STEEL STRUCTURES
37'-0" 37'-0"
R50'-0"
15,254sf
EDR-3
THREE POLE STEEL STRUCTURES
R50'-0"
7,854sf
SINGLE POLE STEEL STRUCTURES
JOB NUMBER: 51675
FILENAME: TREECLEARING1
DRAWN BY: BMCD-JF
APPROVED BY:
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DATE: 09/09/2008
EXHIBIT 7-10

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14.0 BASIC STANDARDS SUBMISSIONS

14.1 INTRODUCTION

Basic Standards Submissions under Maine Department of Environmental Protection (MDEP) Site Law process focus on details associated with appropriate erosion and sedimentation plan development and implementation. Central Maine Power (CMP) has developed a standard manual, "Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects" (hereafter referred to as "guide" or "manual"), which it uses as a routine part of all transmission and substation projects. This guide is located in Exhibit 14-1. This manual contains effective and proven erosion and sedimentation control requirements, standards, and methods that will be used to protect soil and water resources during construction of the various Maine Power Reliability Program (MPRP) components. The manual is largely based on, and has been developed to be consistent with, the MDEP *Maine Erosion and Sediment Control Best Management Practices (BMPs)*, dated March 2003, and MDEP's Chapter 500, and contains specific BMPs appropriate for electric transmission line and substation construction. This manual has been a component of several prior CMP transmission line and substation applications that have been reviewed and approved by MDEP.

The primary goals of erosion and sedimentation control plans are to minimize soil movement and loss, preserving the integrity of environmentally sensitive areas, and maintaining existing water quality. The guide provided in Exhibit 14-1 provides CMP personnel, their representatives and contractors with a single, cohesive set of erosion control specifications for the MPRP. This guide is designed to provide specifications for the installation and implementation of soil erosion and sedimentation control measures while allowing adequate flexibility for application of the most appropriate measures based on site-specific conditions. All bid packages and contracts for work performed on the MPRP will include these specific guidelines to ensure the work is completed in an environmentally sensitive manner. CMP personnel and their representatives will ensure that the procedures contained in this manual are followed by regularly inspecting all work and requiring corrective action when necessary.

Implementation of the following objectives is required to achieve the goals of this plan:

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- Minimize the extent and duration of soil disturbance;
- Protect exposed soil by diverting runoff to stabilized areas;
- Install temporary and permanent erosion control measures (including installation prior to any site disturbance, up to and including final site restoration); and
- Establish an effective inspection and maintenance program.

The guide includes appendices that contain: definitions of scientific and technical terms; illustrations of proper and improper application of erosion and sedimentation control techniques as a basis for comparison; site-specific erosion and sedimentation control drawings; and other generic and specific references to ensure the proper and adequate implementation of erosion and sedimentation control methods during construction activities. All scientific and technical terms used in this document are defined in the guide.

Specific erosion and sedimentation controls for each substation are provided under separate cover in the Stormwater Management Plans.

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EXHIBIT 14-1

Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects

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Central Maine Power Company

Environmental Guidelines For Construction and Maintenance Activities on Transmission Line And Substation Projects

Prepared for:

Central Maine Power Company
83 Edison Drive
Augusta, Maine 04336

Prepared by:

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249 Western Avenue
Augusta, Maine 04330

December 2007

2nd Edition

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CENTRAL MAINE POWER COMPANY

Environmental Guidelines for Construction and Maintenance Activities on Transmission Line And Substation Projects

1.0 INTRODUCTION

These guidelines contain standards and methods used to protect soil and water resources during construction, reconstruction, and maintenance of transmission lines and substations. They are based on practical methods developed for construction in utility corridors and their use is enforced by both State of Maine and Federal regulatory agencies. The construction practices described in this manual are typically required by the regulatory agencies for all projects. These practices are commonly referred to as Best Management Practices (BMPs). Illustrations have been provided as part of this manual (Appendix D) which demonstrate both the proper and improper techniques used for the more common construction activities.

All contracts for work performed on Central Maine Power Company (CMP) transmission line rights-of-way and substation sites will include these specific guidelines to ensure the project is constructed in an environmentally conscious manner. CMP personnel or their designated representatives will ensure that the guidelines are followed by inspecting all work and prescribing corrective steps to be taken where necessary. While this manual takes into consideration legal requirements, project personnel are still responsible for compliance with all federal, state, and local requirements.

This guide uses a number of scientific and technical terms. Definitions of these terms are provided in Appendix A.

2.0 PLANNING AND DESIGN CONSIDERATIONS

Planning is an important practice that will reduce the risk of erosion on a construction site, saving both time and money for Central Maine Power Company and its contractors. An erosion control plan should be prepared during project planning and design phases. It will likely be required for any Maine Department of Environmental Protection and/or local permits.

The erosion control plan should consist of:

- A narrative.
- A map.
- Plan details.

The narrative should describe the proposed project, existing site conditions, adjacent land uses, and any natural resources or properties that might be affected by the project. Other important details to include are descriptions of critical areas, proposed construction start and end dates, construction sequence, and brief descriptions of erosion and sedimentation control measures, inspections and maintenance programs, and other clearing or construction that has taken place on the site in the last five years.

The map should include pre-development site contours at a scale to identify runoff patterns (minimum 5-foot contour interval), final contours, limits of clearing and grading, existing buffers, critical areas, natural resources, erosion control measures, and other clearing or construction that has taken place on the site in the last five years.

The plan details should include drawing of the erosion control structures and measures, design criteria and calculations, seeding specifications, and inspection and maintenance notes.

Key considerations include resource identification, familiarizing all parties with the construction site and limitations, and construction sequence.

2.1 Resource Identification

Sensitive natural areas which will receive priority treatment include:

- Streams and rivers.
- Great ponds.
- Wetlands.
- Steep slopes.
- Unstable soil conditions.

Sensitive natural areas which may receive priority treatment, depending upon the specifics of the project, include:

- Stream, river, pond, and wetland buffers.
- Significant wildlife habitats.
- Habitat for rare species.
- Historic and prehistoric sites.

During the planning phase, all sensitive natural areas that require priority treatment will be identified. The method of avoiding or crossing the sensitive natural areas to minimize impacts will be identified and incorporated into the project plans. Project plans should be designed and drawn to provide contractors and inspectors with a comprehensive reference guide that include, but is not limited to, locations of sensitive natural areas, access, and abutter and landowner issues. If modifications to the plans need to be made in the field, a designated person shall make necessary changes and shall notify all necessary personnel promptly. Copies of these plans should be provided and explained to equipment operators to assure that construction practices meet the intent of avoiding or minimizing impacts to the identified sensitive natural areas. In addition to the plans, the proposed access ways and water/wetland crossing locations, as well as other environmentally sensitive areas where activities will be restricted or prohibited, will be flagged and/or have signs posted.

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Prior to crossings or construction in or near any sensitive natural areas, a "walk-through" will be conducted. Attendees at the walk-through will include: 1) the contractor, 2) CMP and/or any designated representative, and may include 3) any assigned Third Party Inspector. The purpose of the walk-through is to establish the following objectives, **prior to any clearing or construction work:**

- Identify available or alternate points of access to the project site.
- Identify sensitive natural areas.
- Identify future "No-Access" areas.
- Review color designation for all flagging used.
- Establish the Communication Chain of Command (Contact Point).
- Identify and flag access/construction roads within the ROW and/or project area.
- Establish methods of access over water resource areas (mats, timber corduroy, frozen ground, tracked equipment).

In order to minimize impacts to sensitive natural areas, the above objectives will continually be evaluated throughout the construction process. Project superintendents, foremen, and inspectors should also monitor weather conditions and reports on an on-going basis. Knowledge of changing or anticipated wet weather will allow time to address erosion control needs. In this way, CMP and its contractors will be prepared to respond to changing environmental conditions (e.g., unusually wet or dry weather) and other unknowns that are inherent in the construction and maintenance of transmission lines.

2.2 "Walk-Through" Mechanics

2.2.1 Use of Flagging and Signs

Flagging will be conducted at the time of the walk-through in order to visually identify select features or construction methods to be used. Wetlands may be flagged earlier as part of project permitting. Signs may also be installed following the walk-through to direct construction to approved access routes and away from "no access" areas. The CMP flagging color-code is as follows:

- ***Glow-pink*** with the printed words "Wetland Delineation", "Wetland Boundary" or "Wetlands". This flagging denotes the edge of wetlands.
- ***Red*** with or without the printed words – "Do Not Cross". This flagging denotes a No-Access area where no equipment is allowed.
- ***Yellow*** – no printed words. This flagging denotes the location of an environmental measure such as a waterbar, hay bale barrier, or silt fence.
- ***Blue*** – no printed words. This flagging denotes approved travel ways. This is typically flagged on each side of the access-way to denote the designated travel lane for all access.
- ***Glow-pink with black stripes*** or otherwise printed with the words Buffer or Wetland Buffer. This denotes a setback from a water resource and should be treated the same as No-Access area.

2.2.2 Identification and Use of Existing Roads

Available logging, farm, or access roads, as well as other existing rights-of-way, will be utilized for access to and from transmission line rights-of-way with permission of the respective landowners. In order to minimize ground disturbance, existing roads within the right-of-way and wetland/stream crossing areas will be used whenever possible for travel during construction, unless a better route is agreed upon during the walk-through. The movement of equipment and materials within the transmission line right-of-way will be confined as much as possible to a single road or travel path.

For example, it may be better to construct new access roads in order to: (1) minimize the span of a wetland or stream crossing, or (2) avoid the more environmentally sensitive or "wetter" portions of a wetland or stream crossing.

In all cases, CMP and its contractors will attempt to avoid and minimize impacts to sensitive natural areas. As a result of this procedure, wetland and stream crossings, steep slopes, unstable soils, and other sensitive natural areas will be avoided and adverse impacts minimized whenever practicable.

2.3 Construction Sequencing

Although a "Project Plan" may be specific in identifying the *locations* of water resource areas (wetlands, streams, etc), and the *methods* of access over water resource areas (crane mats, frozen ground, etc) it should not dictate *when* construction activities should occur. It would be impractical to include day to day activities in the "Project Plan" such as, 'pole X will be installed on Y date'. However, including environmental considerations in the daily and weekly project planning is very important. Factors such as the project schedule and weather often determine where and when construction activities occur; environmental impacts should also be considered. Below are some guidelines:

- Work closely with the individual(s) in charge of environmental compliance to plan project activities.
- Construction activities that cause soil disturbance should not occur during or just prior to forecast heavy rain events.
- Coordinate access planning with all of the contractors on the project. Often temporary access roads are used by several different contractors and the construction and use of temporary access roads can cause significant soil disturbance. Minimize equipment and vehicle travel on temporary access ways.
- Stabilize/restore disturbed areas as soon as possible, preferably while equipment is on site. Additional trips with equipment can create more soil disturbance which will need to be stabilized. Often a site can and should be stabilized within hours of when the soil disturbance occurred.
- Use frozen conditions to your advantage. There may be instances where water resource areas can be crossed during frozen conditions in lieu of installing crane mats. Before using this technique consult with the project environmental inspector.

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- Crane mats should be removed as soon as they are no longer needed and/or when conditions are favorable.

3.0 STANDARDS FOR CONSTRUCTION

3.1 Road Construction

The following five standards apply to the construction and/or upgrade of all roads, skid trails, yarding areas, or work pads whether temporary or permanent.

1. Where construction will be located near water resources, such that material or soil may be washed into them, these disturbances will be set back from the edge of the water resource to maximize the amount of undisturbed filtering area between the disturbed area and the resource. These "filter strips" will consist of an area of undisturbed vegetation between the edge of disturbed area and/or silt fence/hay bale barriers placed to intercept any sediment load in runoff water before it can enter the resource area. In order to maintain the integrity and effectiveness of filter strips, sediment barriers should be installed very early in the construction sequence, and they need to be monitored to make sure they are functional. Effective filter strip widths may vary from only a few feet in relatively well drained flat areas to as much as several hundred feet in steeper areas with more impermeable soils. The minimum width of the buffer strip shall be 25 feet or in accordance with local CEO or DEP regulations. The width of the filter strip shall be increased proportionately for slopes longer than 150 feet or for higher sediment concentrations. **Table 1** below provides the recommended widths for the filter strips according to the slope of land between the edge of the resource and any exposed soil.

Table 1
Recommended Widths For Filter Strips Between Disturbed Areas And Water Resources

Slope of Land Between Disturbance and the Resource (Percent)	Width of Filter Strip* (Feet)
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165

*Measured along surface of the ground

2. Wherever possible, construction equipment will either avoid steep slopes or proceed across the slope in a safe manner to avoid excessive disturbance of vegetation and soils. Equipment will not travel straight up or down any slopes with a grade steeper than 10 percent, except where necessary due to safety concerns and/or terrain constraints.

3. Where access roads or construction areas are to be built across the slope, the area will be properly sloped, slanting away from the cut bank to the outside edge of the roadbed in order to facilitate road surface drainage.
4. Slopes of cut-and-fill banks will be no steeper than 1 horizontal to 1 vertical. If located within 100 feet of water resources, the slopes will be no steeper than 2 horizontal to 1 vertical.
5. Rivers, streams, and wetland areas will be crossed, where necessary, at right angles to the channel and/or at points of minimum impact. To insure that natural drainage patterns will not be altered or restricted as a result of construction activities, crossings will be designed and constructed according to specific standards outlined below.

3.2 Stream or Wetland Crossings

The following standards apply to all unavoidable stream, drainage way, or wetland crossings encountered while accessing the project site or on the project site itself.

3.2.1 Types of Crossings Used

The type of crossing used for access is dependent on: the purpose and use of the crossing, the nature of the resource being crossed, ground conditions present at the time of construction, and construction materials available. Some planning guidance is provided below. The appropriate means and location of the crossing will be determined at the time of the formal walk-through. It is important to consult with the project environmental inspector prior to installing any crossing.

- Permanent culverts and bridges will be used only where long-term, continued, and frequent access is required (such as substation access roads).
- Temporary crossings will be used at all other locations. Temporary bridges, culverts, or crane mats must be used to cross any streams, drainage ways, or wetland swales that contain: (1) flowing water, (2) standing water, (3) saturated soils, or (4) organic/mucky soils.
- The use of corduroy as crossing material will be limited to wetlands which are not anticipated to have flowing or standing water during the construction period.
- In certain cases, no crossing material will be required if the stream bottom or drainage way is dry and contains a gravel or solid rock bottom (a "ford"). Fords can only be used if they will cause no unreasonable sedimentation of the stream and no unreasonable alteration of the stream banks and bottom.
- All crossings should include water bars or broad based dips or turn outs on the access, approximately 50 feet from each side of the crossing, to promote filter-strip treatment of runoff.
- All temporary crossings must be stabilized within seven (7) days of its removal, unless specified otherwise.

3.3 Construction in Wetlands

Where structures are to be placed in wetlands, topsoil must be excavated first, and stockpiled separate from subsoil. Be sure that stockpile soils are placed in such a manner that they are readily replaced into the excavated area. Soils shall be replaced into the excavated area in the opposite order they were removed. Excavation and pole placement in wetland areas should be completed within the same day. After pole installation, topsoil must be restored to the original surface grade, except where mounding around a structure is necessary for structure stability.

4.0 INSTALLATION OF CROSSINGS

4.1 Bridges

Bridges are a preferred method for temporary access waterway crossings. Normally, bridge construction causes the least disturbance to the waterway bed and banks when compared to the other waterway crossing methods. Most bridges can be quickly removed and reused without significantly affecting the stream or its banks and without interfering with fish migration.

Materials
Access bridge construction typically entails the use of log stringers as construction materials.

Sizing
Table 2 below illustrates the log sizing requirements depending on the span and anticipated loads.

Table 2
Log Bridge Stringer Requirements

Span	Minimum Log Diameter* (80,000 lb. Load)	Minimum Log Diameter* (40,000 lb. Load)
8 ft.	16 in.	12 in.
12 ft.	18 in.	14 in.
16 ft.	20 in.	16 in.

Wheel guards: 10" diameter
- Size of deck planks: 4" x 12" x 12'
* Assume 6 stringers at 24" centers

Positioning
The following is guidance for the positioning and installation for all permanent and temporary bridges:

- Access roads will cross streams at right angles to the channel at a location with firm banks and level approaches whenever possible.
- Bridge piers and abutments will be aligned parallel to the stream flow so that the original direction of stream flow is not altered.
- Piers and abutments will be imbedded in good foundation material. The grade of the bridge should coincide with that of the road wherever practicable.

For additional specifications on bridge construction, refer to section F-2 of the Maine Erosion and Sediment Control BMPs (see full citation in Appendix C).

4.2 Culverts

Materials

Permanent culverts will be either corrugated metal or plastic pipe. Temporary culverts will be corrugated metal, plastic pipe, or lumber ties. Chemically-treated wood will be not used.

Sizing

Permanent culverts will be sized to have a diameter of at least 3 times the cross-sectional area of the stream channel or will be designed to accommodate 25-year frequency flows. Multiple culverts may be used in place of one large culvert if they have the equivalent capacity of a larger one. A culvert sizing criteria table (3x Rule) produced by the MDEP can be found in Appendix G. However, it is recommended that an engineer be consulted when installing any permanent culvert.

Temporary culverts will also be sized to provide an opening at least 3 times the cross-sectional area of the stream channel and sized to accommodate a 25-year frequency storm flow. The stream channel cross-section will be determined at highest flows or will be approximated during periods of lower flows using the apparent natural high water marks remaining on the stream banks. For small intermittent streams, drainage ways or wetland crossings, the minimum sized culvert that may be used is 18 inches. Multiple culverts may be used in place of one larger culvert if they have the equivalent capacity of a larger one.

Positioning

The following is guidance for the positioning of all permanent and temporary culverts:

- Culverts should be placed to allow for the crossing to take place at right angles to the channel to assure that natural drainage patterns will not be altered.
- Culverts should be placed at the point of narrowest crossing and where firm banks and level approach slopes are available. Slopes should be no greater than 1.5 to 1.

Installation

The following is guidance for the installation of all permanent and temporary culverts:

- Culverts should be of sufficient length to allow both ends to extend at least one foot beyond the toe of any fill used to cover the culvert.
- Inlet and outlet armoring shall extend at least one pipe diameter beyond the upstream and downstream end of the culvert. See Table 3 below for outlet protection in erodible areas.
- Culverts should be bedded on firm ground. Supplemental use of geotextile with gravel can be used to create this firm base. Permanent culvert installation should include firm compaction of the foundation and the fill around the sides of the culvert. Compaction should be done in no less than 8-inch lifts.
- Both the inlet and outlet ends of the culverts will be set at or slightly below the natural stream bottom to allow passage of fish and other aquatic life at all levels of flow. At no point should either end of an installed culvert be positioned in the air out of the water.
- Multiple culverts must be offset in order to concentrate low flows into the culvert within the natural channel.

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- When working in and around a perennial stream, temporary stream diversion may be necessary to avoid creating turbidity in the stream water. This type of work requires a permit from Maine DEP, and must be coordinated with the project environmental inspector.
- Fill used to bury the culvert will be compacted at least half-way up the side of the culvert for its full length in insure that flowing water will not undermine the culvert.
- Culverts will be covered with fill to a depth of at least one foot or one and a half times the culvert diameter, whichever is greater.
- Road fill at the upstream (headwall) and downstream (out-fall) ends of culverts will be armored with either rock rip rap or logs to protect the road fill from being eroded by the action of water or road traffic. This material will be installed up to the level of anticipated high water.
- In areas where the streambed appears highly erodible, the streambed at the outlet end of the culvert will be lined with riprap to prevent erosion and potential stream bed scour. Table 3 below indicates the distances away from the culvert to install such riprap.

Table 3
Culvert Size - Length of Rock Protection

Culvert Diameter (Inches)	Length of Rock Protection From Culvert (Feet)
12 – 20	7
21 – 24	9
30	11
36	13
42 – 48	18
54 – 60	24
66 – 78	32

Removal

Temporary culverts will be removed once their use is no longer necessary. The fill material can be redistributed and spread out on the nearby uplands at a distance sufficient to prevent its reentry into the resource. Silt fence/hay bales, seeding, and mulching may be necessary to stabilize this material. The banks and bottoms of the stream, drainage way, or wetland should be restored to original conditions. Exposed soils on the banks and within 100 feet of the crossing should be stabilized using seed and mulch. Some banks and steep slopes adjacent to streams may require stabilization with curlex or jute matting in combination with seed and mulch.

4.3 Mats (Crane or Swamp Mats)

CMP construction projects require that adequate mats are present at the project site prior to construction. A readily accessible source of mats should also be available in case construction conditions change and necessitate the need for more mats.

Materials

A number of different sized and constructed crane mats are typically available. CMP requires that the appropriate mats be used for the appropriate crossing. For example:

- Longer mats should be used for the longer crossing spans. This practice avoids the need to install additional mats within the crossing area in order to support the "span" mats.
- Mats should be in good condition to allow for their "clean" installation. Having mats in good condition prevents them from being dragged in versus them being carried in due to broken hitching cables, breaking apart on the job site, or becoming imbedded in mud due to their inability to support the required weight.
- Mats with partial/short timbers joined end to end should generally not be used to cross stream channels.

Installation

- Whenever possible, mats should be carried and not dragged. Dragging mats creates more soil disturbance which requires additional erosion control or final restoration work.
- At the crossing location, the ends of the crane mats should extend at least two feet onto firm banks or several feet into the upland edge of a wetland to assure a dry, firm approach onto the mats.
- At crossings which contain open or flowing water, the mats should be supported within the span using cross mats as abutments in order to prevent the impoundment of water or having water flow over the mats.
- At "dry" crossings where no water is present or anticipated during project construction, the mats may be placed directly onto the sensitive natural area in order to prevent excessive rutting, provided stream banks and bottoms are not altered.

Maintenance

Matted crossings should be continually monitored to assure their correct functioning. Mats which become covered with dirt should be kept clean and the material removed must be disposed of in an upland location. The material must not be scraped and shoveled into the water resource. Mats which become imbedded must be reset or layered to prevent mud from covering them or water passing over them.

Removal

Mats should not be removed until their use is absolutely no longer necessary. Specifically, all final restoration work should be completed prior to the mats being removed from the crossings. The planned removal of mats should be coordinated with CMP (or designated representative), the project environmental inspector, and any Third Party Inspector. As temporary structures, they should be removed within one year from the date of installation. All areas disturbed during ford removal shall be stabilized with seed and mulch.

4.4 Corduroy

Materials

Corduroy material will consist of de-limbed trees or logs. The logs must have a diameter greater than three inches at the small end and lengths greater than 18 feet. Shorter length material may be used only as described in the Installation section below.

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Positioning
Corduroy should be placed perpendicular to the direction of travel. Corduroy should be placed at the point of narrowest crossing and where firm banks and level approach slopes are available.

Installation
The corduroy should be placed with the longer length pieces laid down first. The bed of corduroy should not only be placed within the low portions of the crossing but also for at least three feet up the sides of any upland side slopes in order to prevent rutting and sedimentation from the approaches to the crossing.

Once a thick base of corduroy has been laid, pieces shorter than 18 feet can be used to fill gaps and raise the elevation of the corduroy to provide for a more stable crossing.

Removal
Removal is the reverse of installation. Once the corduroy has been removed from the crossing, it may be moved off the right-of-way, burned, or chipped. The material may also be spread and distributed on the ROW over the nearby upland if in accordance with the Maine Slash Law (see Appendix E) and approved by a CMP representative. The banks of streams and drainage ways must be graded back to original conditions. Exposed soils on the banks and within 100 feet of the crossing must be stabilized using seed and mulch. Banks of drainage ways that are expected to receive high flows should be stabilized with seed and curlex or jute matting.

5.0 SURFACE WATER DIVERSION STRUCTURES (WATER BARS)

A number of above-ground structures or techniques are available to divert water out of travel ways and work areas in order to prevent subsequent runoff and erosion. The terminology and definitions for these techniques (i.e., broad-based dips, water bars, skid humps, water turnouts, and cross-drainage box culvert) vary, but the purpose of all is to redirect water moving down a slope into adjacent vegetated areas (filter strips). Any activities that involve land grading have the potential to cause sedimentation. Their use and installation needs to be carefully planned. Planning for these techniques must include timing, use of natural buffers (filter strips), mulching, and temporary and permanent seeding. Minimizing the area of soil exposed at one time is a key component of ensuring that surface water diversion structures function effectively. General standards for their construction are as follows.

Materials
Most of these structures are constructed by excavating or moving and shaping earth from within the access way or work area. The cross-drainage culvert structure typically uses logs or timber to form a box-like structure to catch water from travel ways or side ditches in order to direct it across the travel way and away from disturbed areas.

Positioning
These structures should be installed immediately above and along steep pitches in the road and below seepage areas on natural or cut banks. They should be sited to take advantage of existing vegetation for filtering and slope away from the travel surface. The interval for installing these diversion structures depends on the slope of the road, as well as the nature of the road surface, soils, and wetness. Generally speaking, steeper slopes require shorter distances between

diversion structures. The following table contains recommended distances between installed structures depending on slope.

Table 4
Recommended Distances Between Water Diversion Structures

Slope (Percent)	Spacing (Feet)
0 – 2	500 – 300
3 – 5	250 – 180
6 – 10	167 – 140
11 – 15	136 – 127
16 – 20	125 – 120
21+	100

All of these structures should be sized in anticipation of greater flows resulting from snow melt, spring runoff, and storm rains.

Installation

These structures should be installed at 30-degrees angled down grade. The shape of the backside portion of the structure should have a reverse slope of about 3 percent. Use of a pop-level is recommended to ensure that drainage is away from the road. Structures should be constructed with rounded (not vertical) mounds and dips to allow for firm compaction and to allow re-vegetation.

In the case of the cross-drainage culvert, the minimum width of the open face of the culvert should be 18 inches. The travel surface should consist of at least 12 inches of gravel or soil over the culvert. The slope of the culvert should be a drop of at least 5 inches in every 10 feet of length to ensure proper drainage.

The inlet end of all structures should extend beyond the edge of the access road so that it fully intercepts water flows that may flow onto the access road. The outlet end of the structure should extend out enough to prevent water from flowing around and re-entering the road or work area.

The discharge ends of any of these diversion structures should outlet into a vegetated filter strip. Where heavy flows are encountered or anticipated, the outlet end of the structures should incorporate an apron of rock, gravel, or brush to reduce water velocities. If construction will extend into fall and winter months, be sure to upgrade to meet winter standards all erosion control measures (e.g., increase amount of mulch, etc.), to protect the site from spring runoff.

Where the structure is within 100 feet of a stream or wetland, the incorporation of a small, excavated settling basin or ditch turnout to reduce the velocity of flows and the continued movement of sediment downslope should be considered. In addition, some type of sediment barrier (silt fencing or staked hay bales) will be installed at the outlet of the diversion structure, where vegetated filter strips are narrow or sparsely vegetated, in order to prevent sediment from eroding into water resources.

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Maintenance

Due to repeated travel over these structures, maintenance is critical to their effective functioning. As the structure becomes flattened or rutted, it needs to be re-excavated or graded to ensure the interception and redirection of water runoff. The ends of any cross-drainage culverts should be maintained by clearing away any potential blockages.

Removal

After the completion of the construction project, removal of these structures is not a requirement, with the exception of the cross-drainage culvert. The structures can be left in place provided they have been suitably stabilized with seed and mulch. Any hay bale barriers or silt fence at the outlet end should be removed when the site has a healthy vegetative cover.

6.0 SEDIMENT BARRIERS (STRUCTURAL MEASURES)

6.1 Introduction

The use of properly installed erosion and sediment control barriers is a fundamental and critical component for preventing erosion at CMP construction projects. Erosion control barriers include silt fence, hay bales, and/or erosion control mix berms. In some cases, these barriers may be deemed unnecessary by CMP, its representatives, or a Third Party Inspector due to factors including slope and filter strip width within project boundaries. A typical CMP construction project will use a combination of barriers to effectively control erosion near water resources. Installation and diligent maintenance of these barriers serves the following purposes:

- Assures the environmental integrity of those upland and water resource areas not designated or permitted for disturbance. Specifically, it maintains the onsite vegetative community and water quality of the surface water within the watershed.
- Assures compliance with all applicable federal, state, and local environmental and land use regulations or permit conditions.

Generally, silt fence is the preferred barrier because: it traps a much higher percentage of suspended sediments than hay bales; it can be easier to install, obtain, and transport; and is less costly. In addition, the structural longevity of silt fence is 60 days or longer unlike straw or hay bales' longevity which is 60 days or less.

The standards and procedures outlined in this section of the manual are meant to address a majority of the situations encountered during transmission line and substation construction activities. For additional information on sediment and erosion control methods and techniques, or to address a particularly problematic situation, this manual should be used in conjunction with and supplemented by the Maine Erosion and Sediment Control BMPs. For other recommended references, see Appendix C.

6.2 Silt Fence

Materials

Silt fence is provided by a number of manufacturers and is generally a synthetic fabric pre-attached to wooden staking. The fabric should be pervious to water allowing a flow through rate of 0.3 gallon per square foot per minute. The fabric should contain stabilizers and ultraviolet ray inhibitors to allow it to sustain exposure of a minimum of 6 months. The height of the filter fabric should not exceed 4 feet in height.

Placement

Silt fence is to be utilized at the edge of any planned work area or area which will cause the disturbance of soil. It will be installed to intercept any sheet flow of water and detain sediment from entering water resources or leaving the project site. It should be installed prior to starting work. Given the expansiveness of CMP transmission line projects in particular, the amount of silt fence placement must be selective; however, it should still be used in amounts sufficient to meet potential changing conditions in a pro-active manner. After the primary stabilization measures (temporary and permanent) have been implemented, silt fence use is encouraged in the following selected locations, as appropriate:

- Around all substation project sites.
- Along all access roads or work areas that are within 100 feet of water resources.
- Along all access roads or work areas in upland settings that encounter seepage moving across slope.
- Around all stockpiled soils.

In general, the placement of silt fence is appropriate when:

- Serving a drainage area of no more than .25 acre per 100 feet of silt fence length.
- The maximum slope length behind the fence is 100 feet or less.
- The maximum gradient behind the fence is 50% or 2:1 horizontal/vertical.
- Where the filter strip is not of an adequate width (see Table 1).

Installation

The following installation guidelines are the minimum which should be implemented; however, appropriate changes to silt fence installation should be made as conditions change during the construction operation.

Silt fence will be placed an adequate distance (6-10 feet) beyond the toe of the slope (if there is sufficient room) to allow for sediment accumulation between the disturbed area and the down-gradient water resources. If there is not sufficient room to place the silt fence an adequate distance beyond the toe of the slope, CMP, a representative of CMP, or the Third Party Inspector should be consulted. The barrier should be installed along the contour, within reason. The goal is to slow and pool the sediment-laden runoff to allow fine sediments to settle-out before the runoff enters the water resource. The ends of the barrier should be up-turned to maintain the pool volume.

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A trench shall be excavated approximately 6 inches wide and 6 inches deep on the up-slope side of the silt fence alignment. The lower edge of the silt fence fabric should be entrenched for a distance of at least 4 inches up-slope and then back-filled. Should frozen or rocky ground conditions prevent the effective or practical use of trenching, materials such as bark/wood chips, wood fiber mulch, or a soil erosion control mixture can be used. This material is to be mounded on top of at least 4 inches of filter fabric which would otherwise be trenched.
Silt fence should be installed in a continuous roll to avoid the need of a joint between different pieces of fence. If joints are necessary, filter fabric shall be "spliced" together at a support post, securely sealed, and with a minimum of 6 inches of overlap. Splicing rolls of silt fence entails twisting end posts together, creating a continuous section of silt fence.

Support posts should be placed on the down-slope side or the side closest to or facing the water resource. The posts should be placed 6 feet apart (a maximum of 10 feet may be acceptable in some locations) and driven securely into the ground, typically about one foot deep. Silt fence usually has posts pre-attached.

Silt fence should not be installed in streams or drainage ways where concentrated water flow is present or concentrated flows are anticipated.

Maintenance

Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor is responsible for inspecting all temporary erosion and sediment control barriers. Such inspection is necessary to assure that the barriers are functioning properly as well as identifying new areas requiring installation. A maintenance log should be kept of all erosion control changes, improvements, and maintenance performed.

If any barriers are not functioning properly, they will be repaired or replaced. A sediment control barrier is not functioning if:

1. Water is flowing around the sides or under the barrier.
2. Soil has built up behind the barrier to the point more than half-way up the fence.
3. There is excessive sag in the fence.
4. There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the perimeter silt fence.

Corrective measures include removing accumulated sediment from behind the barrier, restaking, extending the ends of the fence, or installing another fence further upslope.

Removal

Installed silt fence will be removed once it is evident that the soils have become stabilized and the potential for erosion no longer exists. In most cases, the silt fence will not be removed until at least one growing season has past. Removal of silt fence should be coordinated with CMP or their designated representative.

Any ridges or mounds of soil or caught sediment remaining in place after the silt fence has been removed, must be leveled-off to conform to the existing grade. Any newly exposed soil that may erode must be seeded and mulched.

All removed silt fence must be properly disposed of off the project area.

6.3 Hay Bales

Placement
Like silt fence, hay bale barriers can be utilized at the edge of any planned work area or areas where soil disturbance has occurred or will occur. Barriers are installed to intercept sheet flow of water and detain sediment from entering water resources or leaving the project site. Given the expansiveness of CMP transmission line projects in particular, the amount of hay bale barrier placement must be selective, but still in amounts sufficient to meet potential changing conditions in a pro-active manner. Hay bale barriers will be used, as appropriate, in the following locations:

- Around all substation project sites.
- Along all access roads or work areas that are within 100 feet of a water resource area.
- Along all access roads or work areas in upland settings that encounter seepage moving across slope.
- Around all stockpiled soils.

In general, the placement of hay bales is appropriate when:

- Serving a drainage area of no more than .25 acre per 100 feet of barrier length.
- The maximum slope length behind the barrier is 100 feet or less.
- The maximum gradient behind the barrier of 50% or 2:1 horizontal/vertical.
- Where the filter strip is not of an adequate width (see Table 1).

Installation
The following installation guidelines are the minimum which should be implemented; however, appropriate changes to hay bale installation should be made as conditions change during the construction operation.

The barrier will be placed an adequate distance (6-10 feet) beyond the toe of the slope (if there is sufficient room) to allow for sediment accumulation between the disturbed area and the down-gradient sensitive areas. If there is not sufficient room to place the hay bales an adequate distance beyond the toe of the slope, CMP, a representative of CMP, the project environmental inspector, or the Third Party Inspector should be consulted. Within reason, the barrier should be installed along the contour. The goal is to slow and pool the sediment-laden runoff to allow fine sediments to settle-out before the runoff enters the water resource. The ends of the barrier should be up-turned to maintain the pool volume.

A shallow trench shall be excavated the width of the bale and to a minimum depth of 4 inches in which to bed the bale. The excavated soils are then used to seal the lower inside (up-slope) edge of the barrier. The bales should be set tightly together and entrenched with the baling string oriented on the sides (i.e., not touching the ground) in order to prevent deterioration of the string.

Every bale should be staked using 2 stakes per bale. The stakes should be driven in at angles such that it binds and forces abutting hay bales together.

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Gaps between bales shall be packed with loose hay to prevent water from escaping between the bales.

Hay bales will not be placed in streams where flow is present or anticipated.

Maintenance

Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor is responsible for inspecting all temporary erosion and sediment control barriers. Such inspection is necessary to ensure the structures are functioning properly as well as identifying new areas requiring installation. A maintenance log should be kept of all erosion control changes, improvements, and maintenance performed.

If any barriers are not functioning properly, they must be repaired or replaced. A sediment barrier is not functioning if:

- Water is flowing around the sides or under the barrier.
- Soil has built up behind the barrier to the point more than half-way up the hay bale or where there is excessive lean to the barrier.
- There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the hay bale barrier.

Corrective measures include removing accumulated sediment from behind the barrier, re-staking, extending the barrier at the ends, or installing another barrier further up-slope.

It is not recommended that straw or hay bales be used for periods greater than 60 days.

Removal

Installed hay bales will be removed once it is evident that the soils have become stabilized and the potential for erosion no longer exists. In most cases, the hay bale barrier will not be removed until at least a healthy growth of vegetation is established on the disturbed site. Removal of hay bale barriers should be coordinated with CMP or their designated representative.

Any ridges, mounds of soil, or caught sediment remaining in place after the hay bales have been removed, must be leveled-off to conform to the existing grade. Any newly exposed soil that may erode must be seeded and mulched.

All removed hay bales must be properly disposed of, or broken up and used as mulch on the bare soils near the barrier.

6.3.1 Problems With Straw or Hay Bale Barriers

There are several situations where straw or hay bale barriers may be ineffective or cause problems:

1. When improperly placed and installed (such as staking the bales directly to the ground with no soil seal or entrenchment), hay bales allow undercutting and end flow.

2. When used in streams and drainage ways, high water velocities and volumes destroy or impair their effectiveness.
3. When bales are not inspected and maintained adequately.
4. When hay bale barriers are removed before up-slope areas have been permanently stabilized.
5. When hay bale barriers have not been removed after they have served their usefulness.

6.4 Erosion Control Mix Berms

Composition

Erosion control mix berms are made up of shredded bark, stump grindings, and composted bark. It may be made on a project site if adequate materials are available, however its composition needs to be a well-graded mix of different particle sizes. Wood chips, bark chips, ground construction debris and processed wood cannot make up the organic component of the mix. Be sure to consult with the project environmental inspector regarding the suitability of any erosion control mix material proposed for use.

Installation

Erosion control mix berms are simply placed on the surface of the ground and do not require any soil disturbance. The berm should be located in a similar manner to other sediment control barriers along contour, downslope of disturbed soils. Also similar to other sediment barriers, they should not be placed in areas of concentrated runoff, below culvert outlets, around catch basins, or at the bottom of a large contributing subwatershed. At the toe of shallow slopes less than 20 feet long, at a minimum berms should be 12" high and a minimum of 2 feet wide at their base. For longer or steeper slopes, the berms should be wider to accommodate additional runoff. They are ideal for installation on frozen ground, on shallow to bedrock soils, outcrops of bedrock, and heavily rooted forested areas (i.e., those areas where other barriers are difficult to install).

Erosion control mix can also be placed in a synthetic "sock" to create a contained stable sediment barrier. This is especially useful in areas where trenching is not feasible, such as frozen ground, across pavement, or compacted gravel. When in a sock, erosion control mix can staked in an area of concentrated flow (i.e., ditch or swale) as the netting prevents movement of the mulch mixture.

Maintenance

As with other barriers, inspection should be performed after each rainfall or daily during prolonged periods of rain. Accumulations of sediment should be removed when they reach half the height of the barrier, and the berms can be reshaped and new material can be added as needed.

Removal

In most cases, erosion control mix berms do not need to be removed. They will continue to function as they decompose, become part of the soil on the site and will naturally revegetate. If synthetic socks are used, the erosion control mix can be emptied from the sock and the socks can be disposed of off site.

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7.0 NONSTRUCTURAL EROSION CONTROL MEASURES

7.1 Nonstructural Measures Defined

Nonstructural measures are temporary or permanent methods used to cover exposed soil areas to prevent erosion from occurring. Their purpose is to cover whole areas of exposed soil to prevent initial erosion of soil from a construction site.

Examples of nonstructural measures include hay or straw mulch, erosion control mix, matting, or seeding.

7.2 Importance of Nonstructural Measures

Nonstructural measures are important because they provide both temporary and permanent protective cover to exposed soils. Generally, they provide the first line of protection against erosion, and can be the most effective means of preventing erosion. This protection is important because exposed soils are easily eroded by wind or water. Some soils such as silts can easily be removed from a construction site by rainwater. The impact of individual raindrops on exposed soils can loosen soil particles, and these particles can then be carried off the work site by runoff and deposited into water resources including streams, rivers, wetlands, ponds, and lakes. Silt particles don't settle out of water easily, and water siltation can pollute surface waters and harm aquatic creatures such as insects and fish. For example, brook trout, one of Maine's premier game fish species, requires clear, high quality water in order to survive. Silty water can reduce spawning habitat, irritate fish gills, lower oxygen content in water, and make fish susceptible to diseases.

Dry soil conditions and high winds can also cause siltation. When small particle soils such as silts become dry, they have a baby powder-like texture and can easily be swept away by winds. Nonstructural measures help prevent wind erosion because they hold moisture next to the soil, keep the soil from drying out due to wind exposure, and prevent winds from carrying away dry soil particles. Keep in mind, however, that proper construction sequencing is invaluable (See Section 2.3).

7.3 Placement of Nonstructural Measures

Nonstructural measures should be used whenever there is a possibility that exposed soils on a construction site could wash into adjacent sensitive water resources. Temporary nonstructural measures such as hay or straw mulch should be spread on exposed soils within 100-feet of water resources within 48 hours of initial soil disturbance, or before any predicted storm event.
There are two types of nonstructural measures: temporary and permanent. Temporary measures are typically used <u>during</u> construction, while permanent measures are usually applied <u>after</u> construction is complete (i.e., restoration). Provided below are general discussions and explanations of the common nonstructural measures that are used on CMP construction sites.

7.3.1 Temporary Measures

- Hay or straw mulch (unanchored on slopes less than 8%, anchored on slopes greater than 8%) on exposed soil areas and soil stockpiles in the construction area.
- Temporary seeding covered by hay or straw mulch on soil stockpiles or areas of exposed soil next to sensitive resources that are not scheduled for final restoration for 30 days (this only applies between the dates of April 16 to October 31 of any given year). Temporary seeding is not required during the Winter Construction Season.
- Erosion control mix can be used as a stand-alone temporary mulch on slopes that are 2 horizontal to 1 vertical, or less, on frozen ground, in forested areas, or at the edge of gravel parking and areas under construction. It should be applied at a thickness of 4 to 6 inches.
- Rolled Erosion Control Products (RECP's) such as Curlex or Jute matting, can be used on areas of high wind exposure, steep slopes (steeper than 8% grade), unstable soils, and stream/river bank restoration areas. Matting is typically anchored (usually with large staples, as recommended by the manufacturer). Although this type of material is usually used during final restoration, it is considered a temporary measure because it generally deteriorates within two years.

Table 5
Temporary Seeding Rates and Dates

Seed	Lb./Ac	Seeding Depth	Recommended Seeding Dates	Remarks
Winter Rye	112(2.0 bu)	1-1.5 in.	8/15-10/1	Good for fall seeding. Select a hardy species, such as Aroostook Rye.
Oats	80 (2.5 bu)	1-1.5 in.	4/1-7/1 8/15-9/15	Best for spring seeding. Early fall seeding will die when winter weather moves in, but mulch will provide protection.
Annual Ryegrass	40	.25 in.	4/1-7/1	Grows quickly but is of short duration. Use where appearance is important. With mulch, seeding may be done throughout growing season.
Sudangrass Perennial	40 (1.0 bu) 40 (2.0 bu)	.5-1 in. .25 in.	5/15-8/15 8/15-9/15	Good growth during hot summer periods. Good cover, longer lasting than Annual Ryegrass. Mulching will allow seeding throughout growing season.
Temporary mulch with or without dormant seeding			10/1-4/1	Refer to TEMPORARY MULCHING BMP and/or PERMANENT VEGETATION BMP.

Proper application rates, location, and seasonal consideration are provided in Table 6 on page 22 of this manual.

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7.3.2 *Permanent Measures*

Uplands

- Permanent grass and legume seeding covered by hay or straw mulch on all areas that have been restored to final grade (this seeding generally applies between the dates of April 16 to October 31 of any given year). This is required to establish permanent, perennial, vegetative cover on exposed soils. Permanent seeding is not required during the Winter Construction Season, although dormant seeding may be performed. (See Section 8.0 for details on winter construction.)
- Seeds covered by anchored (usually with large staples) Curlex or jute matting in areas of high wind exposure, on steep slopes (steeper than 8% grade), unstable soils, and stream/river bank restoration areas.
- The soil may need to be properly prepared before any seeds are placed on the ground. This preparation may include addition of fertilizer (only in designated upland areas not adjacent to, or near waterbodies or wetlands, if in doubt ask the environmental or construction inspector) in areas that have been tested, and are found to be deficient in plant nutrients.
- Erosion control mix can also be used as a permanent mulch to provide a buffer around disturbed areas. It can be left in place to decompose and naturalize. It will eventually support vegetation, which should be promoted. If vegetation is desired in the short-term, legumes and woody vegetation can be planted, which will create additional stability.

Wetlands

- Wetland areas are to be seeded only with resource agency approved wetland seed mixes. If it is decided that wetlands will not be seeded, disturbed wetland will be graded to original contours, mulched with straw, and allowed to revegetate naturally.

As with the Temporary Measures, refer to Table 6 on page 22 for proper application rates, locations, and seasonal considerations.

For permanent seeding mixtures refer to Appendix A of the Maine Erosion and Sediment Control BMPs.

8.0 WINTER CONSTRUCTION CONSIDERATIONS

If a project is actively being constructed between November 1 and April 15 of any given year, sediment and erosion control guidelines developed by the Maine Department of Environmental Protection for projects occurring during the winter months must be followed.

Of course, nothing can replace good common sense. These guidelines may not be necessary at all times during the winter construction dates for several reasons. For example, if there is no snow on the ground or the ground isn't frozen by November 1, only the standard BMPs must be followed. Also, if the ground thaws and all the snow is gone before April 15, the standard BMPs may be appropriate. Nothing substitutes good judgment, being familiar with the construction site, and being aware of the site-specific conditions. Proper construction sequencing (Section 2.3) can greatly minimize environmental impact during winter construction. When in doubt, contact the project construction manager or environmental inspector with any questions.

Table 6 on page 22 highlights some of the major differences between the winter construction guidelines and normal BMPs used during construction and for temporary stabilization. The table presents differences for temporary measures that should be used during construction, and permanent measures when construction is completely done.

Table 6
Nonstructural Erosion Control Measures (Seasonal Differences in Construction BMP Requirements)

Dates	General Construction April 16 through October 31 of every year	Winter Construction November 1 through April 15 of every year
Mulch on slopes less than 8%	Within 100-feet of sensitive water resources apply hay and/or straw mulch at a minimum of 70 lbs./1000 square feet of exposed soil (about 2 bales). Must be done within 7 days of initial soil disturbance and before storm forecasted events, unless specified otherwise.	Within 100-feet of sensitive water resources apply and maintain properly anchored hay and/or straw mulch at a minimum of 150 lbs./1000 square feet of exposed soil (about 5 bales) at all times. (double the April 16 – October 31 rate)
Mulch on slopes greater than 8%	Hay or straw mulch can be applied without being anchored, though specific site conditions may require use of anchoring.	Apply mulch as specified above. Properly anchor with Curlex, jute matting, or similar mulch netting on upland slopes exceeding 8% and within 100 feet of streams if no construction activities are anticipated for 7 or more days.
Area of exposed soils allowed at any one time	No restriction on area exposed, but contractor must attempt to minimize amount of exposed soil at any one time, especially next to water resources.	Not more than one (1) acre of exposed (not mulched or otherwise devoid of vegetative cover) soil.
Sediment barriers	A single line of sediment barriers including silt fence, hay bales, or wood waste filter berms must be installed between water resources and disturbed soils.	If soil is frozen, wood waste filter berms or 2 lines of sediment barriers (including hay bales and silt fence) must be placed between water resources and disturbed soils.
Temporary seeding in uplands	If required, apply at the rate specified by the supplier, CMP Environmental Department, or Environmental Inspector. Cover with mulch.	Not required, but if temporary seeding is desired, it must be applied at a rate 3 times higher than the General Construction Season, and covered with mulch.
Temporary seeding in wetlands	Wetlands are not to be seeded unless done so with an agency approved seed mix. Annual Rye Grass is not acceptable and shall not be used. Disturbed wetland areas will be mulched exclusively with straw.	Wetlands are not to be seeded unless done so with an agency approved seed mix. Annual Rye Grass is not acceptable and shall not be used. Disturbed wetland areas will be mulched exclusively with straw.
Permanent seeding in uplands	Site must be seeded at rate specified by the supplier and covered with hay or straw mulch. If needed, the site can be limed and fertilized.	Not required before April 16, but if dormant seeding is desired, the site should receive an adequate cover of loam, if necessary, be seeded at a rate 3 times higher than the General Construction Season, and covered with mulch at a minimum of 150 lbs./1000 square feet.
Permanent seeding in wetlands	Do not apply permanent seed mixes to wetland areas unless they are specially designated wetland seed mixes approved by a resource agency.	Do not apply permanent seed mixes to wetland areas unless they are specially designated wetland seed mixes approved by a resource agency.
Temporary seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-10-10 fertilizer may be applied at a rate of 600 lbs./acre and limestone at 3 tons/acre.	Not required, but seedbed can be prepared according to General Construction requirements.
Permanent seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-20-20 fertilizer may be applied at a rate of 800 lbs./acre and limestone at 3 tons/acre.	Not required before April 16, but if dormant seeding is desired, the seedbed can be prepared according to the General Construction requirements.

Dates	**General Construction** **April 16 through October 31 of every year**	***Winter Construction*** **November 1 through April 15 of every year**
Temporary slope stabilization	Same as winter construction season, but mulch does not need to be anchored.	Anchored hay or straw mulch on slopes greater than 8% and drainage ways with greater than 3% slope as necessary. Wood waste mix can be used on slopes in place of anchored hay or straw mulch.
Maintenance of erosion controls	Same as winter construction guidelines.	All erosion controls should be inspected periodically to ensure proper function. If any evidence of erosion or sedimentation is evident, repairs should be made to existing controls or other methods should be used.
Inspection and monitoring	Monitoring should be performed as needed until a new, healthy vegetative cover is attained on the site. This applies to both temporary and permanent seeding.	Monitoring should be performed as needed to ensure proper stabilization and re-vegetation (both temporary and permanent). Starting in the spring following completion of the project, inspections should be performed until new, healthy vegetative cover is attained.

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9.0 SITE RESTORATION STANDARDS

Following completion of the construction work, the contractor will be responsible for conducting site restoration work. The following guidelines will apply to all activities, including temporary and permanent roads, stream/wetland crossings, staging and work areas, and substation sites.

9.1 Procedure

At the completion of project construction in an area or at the end of the construction, CMP or their designated representative, the contractor, and any Third Party Inspector will review the project's restoration needs and prioritize the areas. This prioritization should consider time of year, ground conditions, re-vegetation probabilities, and equipment availability. A restoration "walk-through" is strongly recommended.

In many cases a site can and should be restored within hours of when the soil disturbance occurred. Often getting the equipment to a site that needs to be restored only creates more disturbed area to restore. It is important to "restore as you go" to reduce the equipment travel on temporary access roads. It can be particularly difficult to restore an area that was disturbed during winter construction activities in the spring or summer.

Likely areas of restoration include, but are not limited to:

- Around substation construction areas.
- Around pole and anchor pole placement.
- All wetland, stream, or brook crossings, particularly the approaches and any stream banks.
- Drainage ways or ditches.
- All temporary or permanent constructed roads, yarding, and staging areas.
- Cut banks.
- Steep slopes (over 8%).

9.2 Methods for Restoration

There are several methods of restoration for different areas.

1. All soil that is excavated, mounded, or deposited during construction will be re-graded or removed from the site as directed by CMP. All re-grading and redistribution of soil will be done to match existing grade.
2. The banks and bottoms of brooks, streams, and rivers will be restored to natural conditions. In general, any material or structure used at temporary crossings will be removed, and the bank and bottoms restored to their original depth and contour.
3. On permanent access roads, stream culverts and bridges will be left intact and in good repair to remain available for maintenance operations and/or public access (woods roads, camp roads, etc.).
4. On those construction roads to be closed to future vehicle traffic (as determined by CMP), bridges, culverts, and other temporary crossing or water diversion structures will be removed and the banks and bottoms restored to original conditions.

5. Previously installed water bars may remain or new ones will be installed at locations designated by CMP, their designated representative, or the Third Party Inspector. To prevent accelerated soil erosion, such water bars will be installed on all access and construction roads to be closed to vehicle traffic and on steep sections of permanent roads. Permanent water bars will be constructed to a sufficient height and width to divert the amount of water anticipated at each location as well as to provide some post-project permanence to the site. Water bars on permanent roads will be constructed in such a manner that they will remain effective and require minimal maintenance, and will be permanently seeded to ensure their long-term stability.
6. All areas severely rutted by construction equipment will be re-graded and permanently revegetated.
7. Upon completion of the project, the following areas will be permanently revegetated or otherwise permanently stabilized:
   a) All exposed soil within 100-feet of the edge of any water resource, including, but not limited to, discontinued roads, staging areas, and fill around the base of transmission line structures.
   b) Areas of exposed soil on slopes in excess of eight (8) percent, including discontinued roads and construction trails.
   c) Cut and fill banks subject to erosion.
8. Liming, fertilizing, and seeding requirements for permanent re-vegetation will depend upon the soil type and drainage condition of the site. In the absence of soil tests, permanent seeding will generally be done in accordance with "Procedures for Permanent Seeding for Erosion Control" found in Table 6 on page 22.
9. The contractor will be responsible for the proper maintenance of all revegetated areas until the project has been completed and accepted. Where seed areas have become eroded or damaged by construction operations, the affected areas will be promptly re-graded, limed, fertilized, and re-seeded as originally required.
10. The contractor will perform all erosion control work to the complete satisfaction of Central Maine Power Company before the work is accepted. Central Maine Power Company will base acceptance of the erosion control and stabilization work on a final inspection.

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APPENDIX A

DEFINITION OF TERMS

APPENDIX A
DEFINITION OF TERMS

Adjacent to a natural resource: Within 75 feet of, or in a position to wash into, a water resource (river, stream, brook, pond, wetland, or tidal area).
Annual seed mix: Seed mixture largely made up of plants that only persist one growing season.
Brook: Essentially the same as a stream, a water course that has a defined channel, a gravel, sand, rock or clay base, and flows at least part of the year. It may be a dry channel part of the year.
Corduroy: Logs greater than 3 inches in diameter at the small end and at least 18 feet long that are placed perpendicular to travel direction, on approaches to and in wetlands for crossings. The purpose of the logs is to prevent rutting and preserve vegetation root integrity in and adjacent to wetland areas. May also be used on approaches to mats or bridge stream crossings.
Crossing: Any activity extending from one side to the opposite side of a sensitive natural resource whether under, through, or over that resource. Such activities include, but are not limited to, roads, fords, bridges, culverts, utility lines, water lines, sewer lines, and cables, as well as maintenance work on these crossings. Crossings should be done to minimize impact. For example, crossing at a right angle to the resource and finding the driest or narrowest spot is one method for minimizing impact.
Cross-sectional area: The cross-sectional area of a stream channel is determined by multiplying the stream channel width by the average stream channel depth. The stream channel width is the straight-line distance from the normal high water line on one side of the channel to the normal high water line on the opposite side of the channel. The average stream channel depth is the average of the vertical distances from a straight line between the normal high water marks of the stream channel to the bottom of the channel.
Culvert: A pipe or box structure of wood, metal, plastic, or concrete used to convey water.
Erosion: Movement of earthen material by water or wind.
Erosion control blanket (matting): Manufactured material made out of natural or synthetic fiber designed to control movement of earthen material when installed properly.
Erosion control mix: Erosion control mix consists primarily of organic materials such as shredded bark, wood chips, stump grindings, composted bark, or similar materials. Ground construction debris or reprocessed wood products are not acceptable for use in erosion control mix. It contains a well-graded mix of particle sizes and may contain rocks up to 4 inches in diameter. Properly manufactured mix will have organic matter content between 80 and 100 percent (dry weight), 100 percent of particles must pass a 6-inch screen, the organic portion needs to be fibrous and elongated, it may contain only small proportions of silts, clays, or fine sand, and its pH should be between 5.0 and 8.0. Its applications include erosion control berms and mulch.
Erosion control plans: Written guidelines specific to a project or activity, describing various techniques and methods to control erosion for specific construction activities.
Fill: Any earth, rock, gravel, sand, silt, clay, peat, or debris that is put into or upon, supplied to, or allowed to enter a water body or wetland. Material, other than structures, placed in or adjacent to a water body or wetland.
Filter strip: Undisturbed areas of ground consisting of natural vegetation and natural litter such as leaves, brush, and branches, located between a water resource and access road, skid road or trail, or other area of disturbed soil.

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Ford: A permanent crossing of a stream utilizing an area of existing, non-erodible substrate of the stream, such as ledge or cobble, or by placing non-erodible material such as stone or geotextile on the stream bottom.
Geotextile, Non-woven: Synthetic material made of spun polypropylene fiber used to support wetland fill or stabilize soils.
Geotextile, Woven: Synthetic material of woven polypropylene used to stabilize soils and make sediment barriers (silt fence).
Great pond: An inland water body which in a natural state has a surface area in excess of 10 acres, and any inland water body which is artificially formed or increased which has a surface area in excess of 30 acres.
Intermittent watercourse: Water course that has water in it only part of the year. It is still considered a natural resource.
Mats: Pre-constructed, portable, timber platforms used to support equipment or travel in or over wetlands or water bodies.
Mulch: Temporary erosion control such as hay, bark, or some similar natural material utilized to stabilize disturbed soil.
Perennial seed mix: Seed mixture made up of seeds from plants that persist for several years.
Perennial watercourse: A river, stream, or brook depicted as a solid blue line on the most recent edition of a United States Geological Survey 7.5 minute series topographic map. Typically has water in it year round.
Permanent access road: Project access road that is not restored after project construction completion. Permanent access roads should be designed and constructed so they are not an erosion problem.
Permanent stabilization: Establishment of a permanent vegetative cover on exposed soils where perennial vegetation is needed for long-term protection.
Permanent vegetative cover: Perennial seed stock, including but not limited to grasses and legumes that persist for more than several growing seasons.
Protected Natural Resource: Coastal sand dune system, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, community public water system primary protection areas, great ponds or rivers, streams, or brooks. (From the Maine Natural Resources Protection Act, 38 M.R.S.A. Section 480-B., revised 2007).
Riprap: Heavy, irregular-shaped rocks that are fit into place, usually without mortar, on a slope in order to stabilize and prevent soil erosion.
Sediment barrier: Staked hay bales, silt fence, or similar materials placed in a manner to intercept silt and sediment laden water runoff.
Sedimentation: Deposition of earthen material in a water body or wetland.
Sensitive Natural Resource: Area that deserves special attention because it is significant wildlife habitat, fisheries habitat, or has other natural resource values. These areas may require the use of minimum impact construction techniques such as use of mats, leaving vegetation intact for buffers, special timing of construction, or other specific techniques.
Settling basin (sediment/catch basin): Excavated pit placed to intercept water running off disturbed soils or dirt road bed. Usually used only where filter strip is inadequate to protect a stream, pond, or wetland from silt and sediment.
Silt fence: Woven geotextile sediment barrier. Proper installation requires placement on-contour and keying the fabric in at ground level.
Steep slopes: Slopes in excess of eight (8) percent.

Stone check dam: A small, temporary dam constructed across a swale or drainage ditch. The purpose is to reduce the velocity of concentrated flows, reducing erosion and trapping sediment generated in the ditch.
Stream: Generally, a channel between defined banks with a gravel, sand, rock, or clay base that flows at least part of the year. It may be a dry channel part of the year. The Maine Natural Resources Protection Act contains a more detailed definition.
Structure: Anything built for the support, shelter, or enclosure of persons, animals, goods, or property of any kind, together with anything constructed or erected with a fixed location on or in the ground. Examples of structures include buildings, utility lines, and roads.
Temporary access road: Road constructed solely for project access which is restored to original grade upon project completion, if not sooner. All exposed soils on access road adjacent to water bodies or on slopes steeper than eight percent must be stabilized with a permanent seed mix and mulch or matting.
Temporary stabilization: Mulch, matting, or seed, or a combination thereof, utilized to stabilize soil. Soil stockpiles left in place longer than 14 days must have temporary stabilization.
Temporary vegetative cover: An annual seed mixture, typically annual rye and oats.
Topography: The contour and elevation of the surface of the ground.
Turn out: Water diversion that directs water out of a ditch or off a travel-way and into a vegetated buffer.
Upland edge: The area of uplands alongside a wetland, stream, or water body.
Wastes requiring special handling: Wastes generated from construction activity including engine oil, hydraulic oil, gear oil, diesel, gasoline, or coolants.
Water bar: Constructed bar across an access road or skid trail that directs surface water off the road or trail into a stable vegetated surface or filter strip. They are used as a temporary measure on active roads or when closing roads permanently to prevent erosion.
Water body: River, stream, brook, pond, wetland, or tidal area.
Water resource: River, stream, brook, pond, wetland, or tidal area.
Wetland: An area that is inundated or saturated by surface or groundwater at a frequency and for a duration sufficient to support, and which under normal circumstance do support, a prevalence of wetland vegetation typically adapted for life in saturated soils. The Maine Natural Resources Protection Act contains a more detailed definition.

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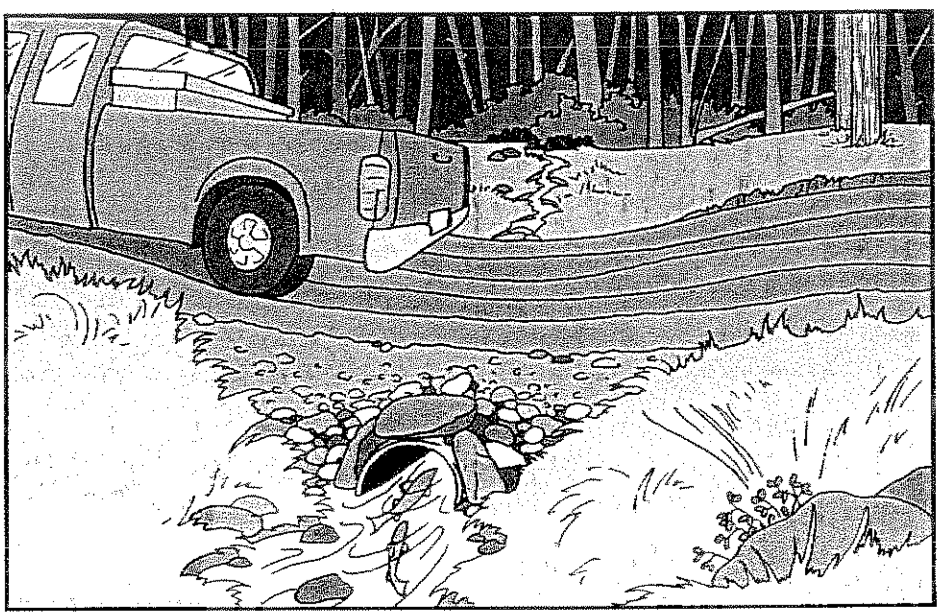
APPENDIX D

CONSTRUCTION TECHNIQUE ILLUSTRATIONS

CULVERT CROSSING

IMPROPER INSTALLATION

- Culvert is undersized, allowing overflow to cross travel-way
- Insufficient cover thickness over culvert
- Outlet is not stable, leading to erosion
- Culvert outlet is set too high causing it to be impassable to fish and other aquatic organisms



PROPER INSTALLATION

- Culvert is adequately sized for flow
- Sufficient cover thickness over culvert
- Inlet and outlet are adequately supported by gravel and rock to protect and maintain stability
- Outlet is properly seated at or below stream bottom allowing aquatic organisms to access upstream

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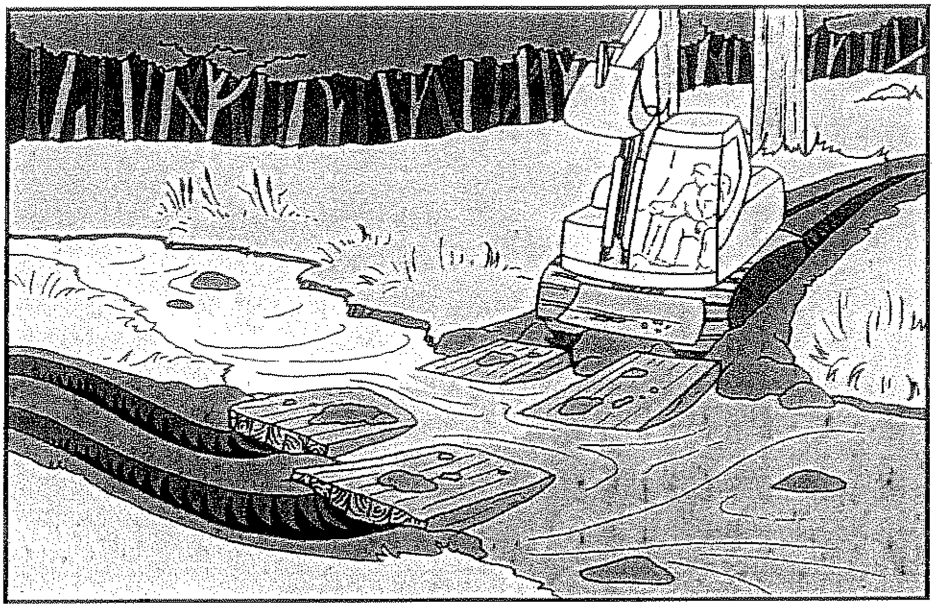
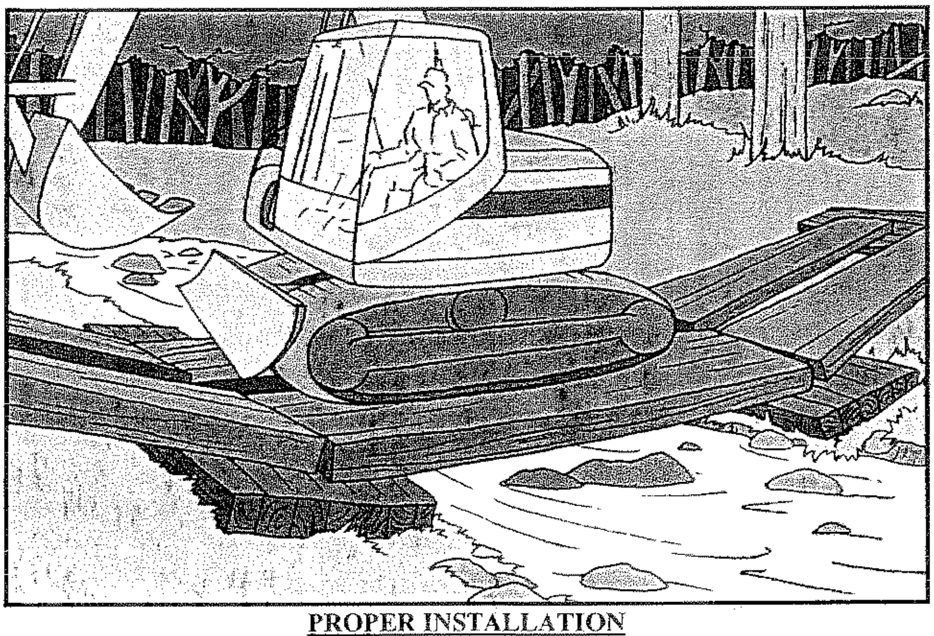
CRANE MATS – WATERBODY CROSSING



IMPROPER INSTALLATION

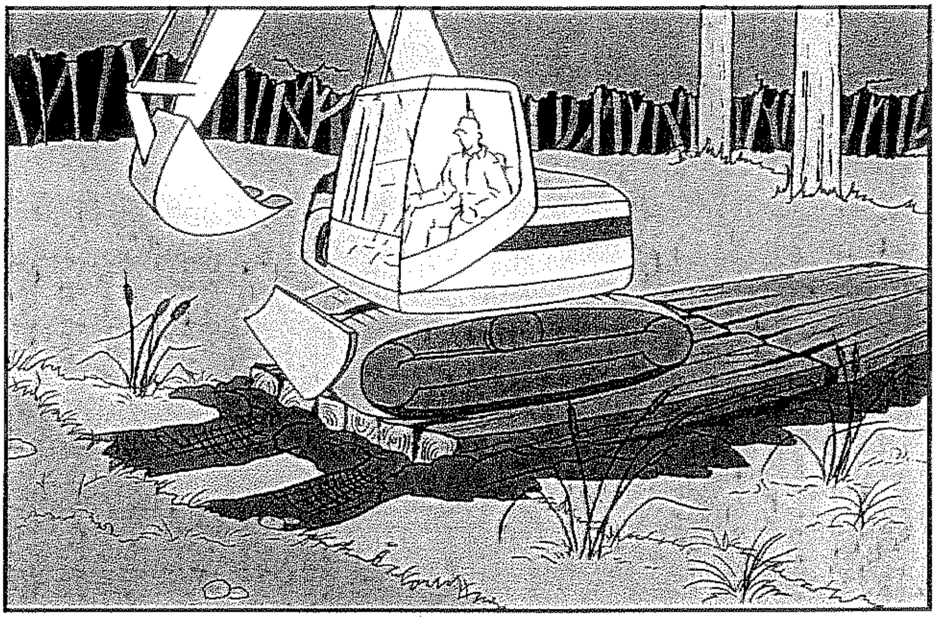
- Mats not long enough to keep equipment out of water and wetland soils
- Lacks cross supports which elevate travel mat
- Mats do not extend far enough to protect wetland soils from rutting



PROPER INSTALLATION

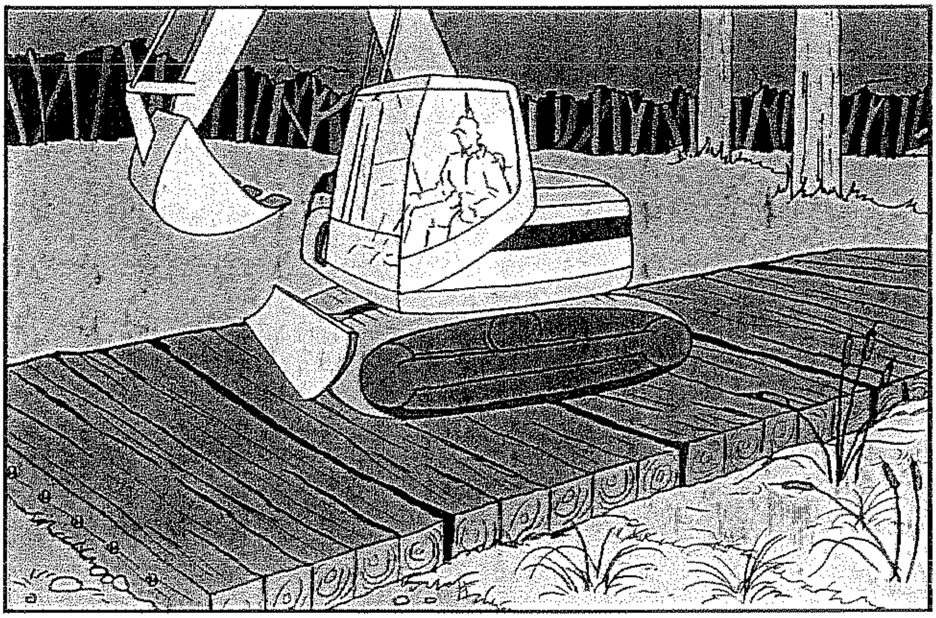
- Mats are elevated by cross-supports on stream banks, keeping them up out of water and out of wet soils
- Water flows under mats
- Mats extend over approaches to crossing protecting soils from rutting and eroding
- Equipment stays out of water and wetlands

CRANE MATS – WETLAND CROSSING



IMPROPER INSTALLATION

- Long axis of mats is not perpendicular to travel direction
- Mats are working down into wetland causing significant disturbance and picking up mud
- Mats do not extend beyond wetland edge to solid ground



PROPER INSTALLATION

- Correct orientation relative to travel direction
- Entire wetland is spanned, preventing rutting at ends of crossing

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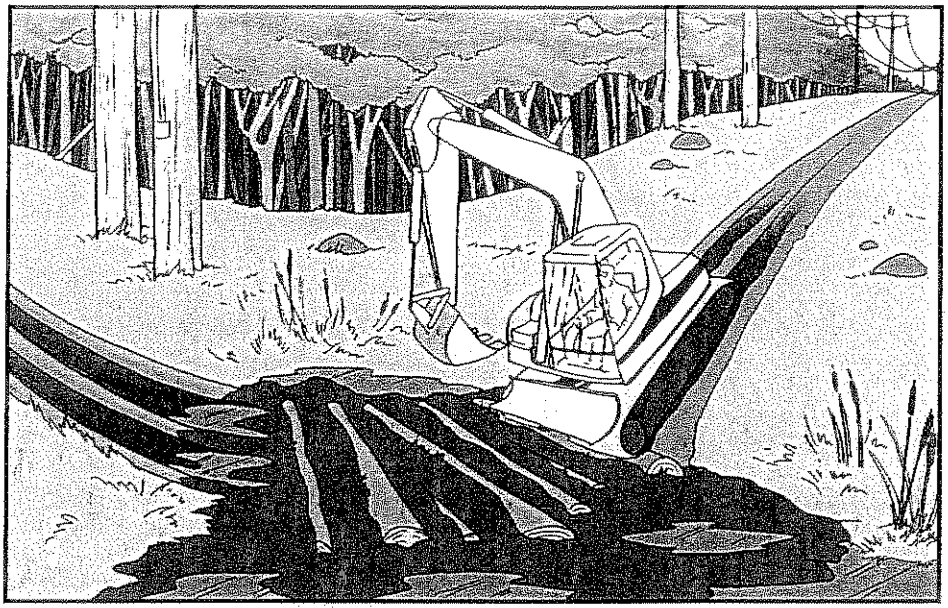
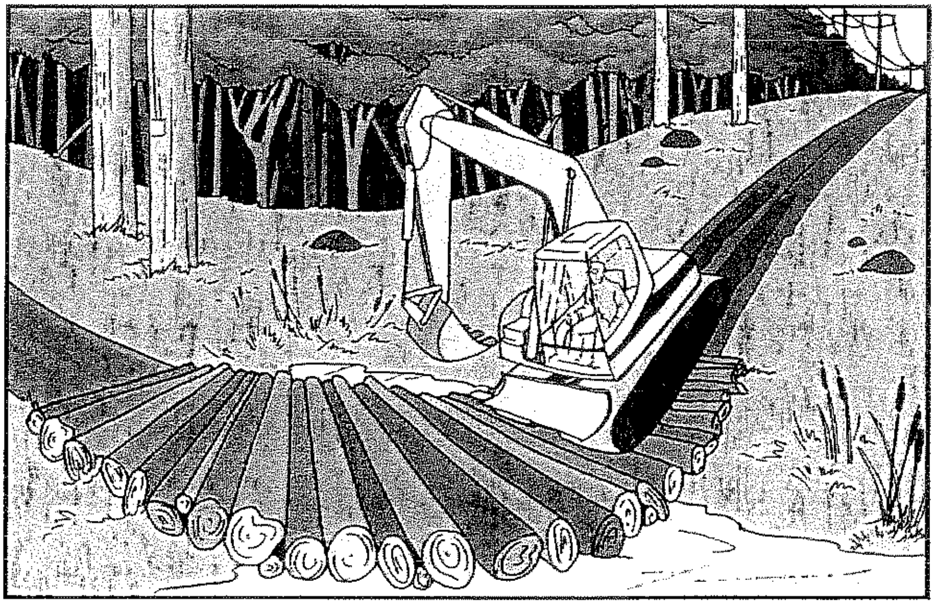
CORDUROY CROSSING



IMPROPER INSTALLATION

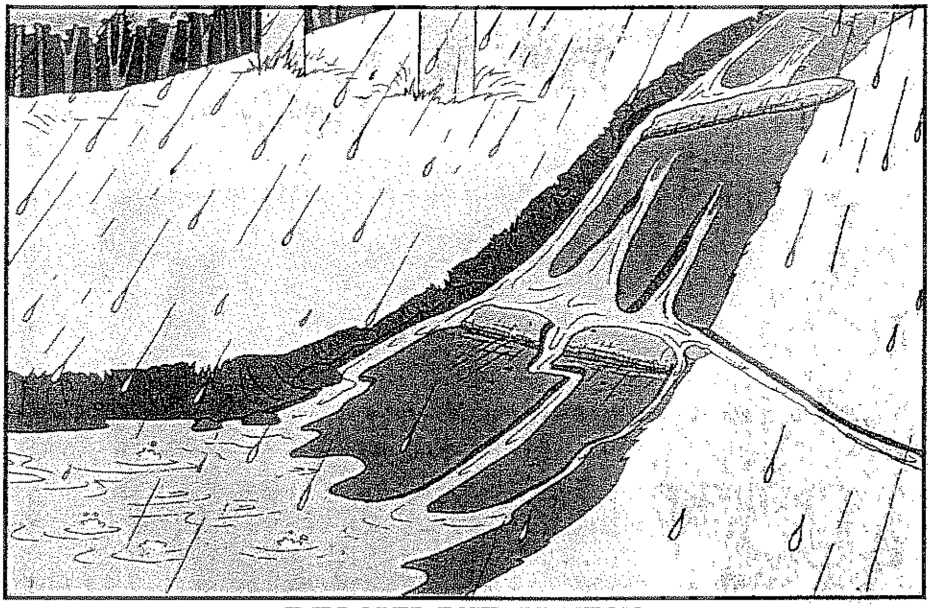
- Insufficient corduroy to support equipment
- Corduroy is sunken into wetland soil
- Approaches are steep, rutted, and are not protected with additional corduroy or slash
- Flow is interrupted, and water is soiled with mud and silt



PROPER INSTALLATION

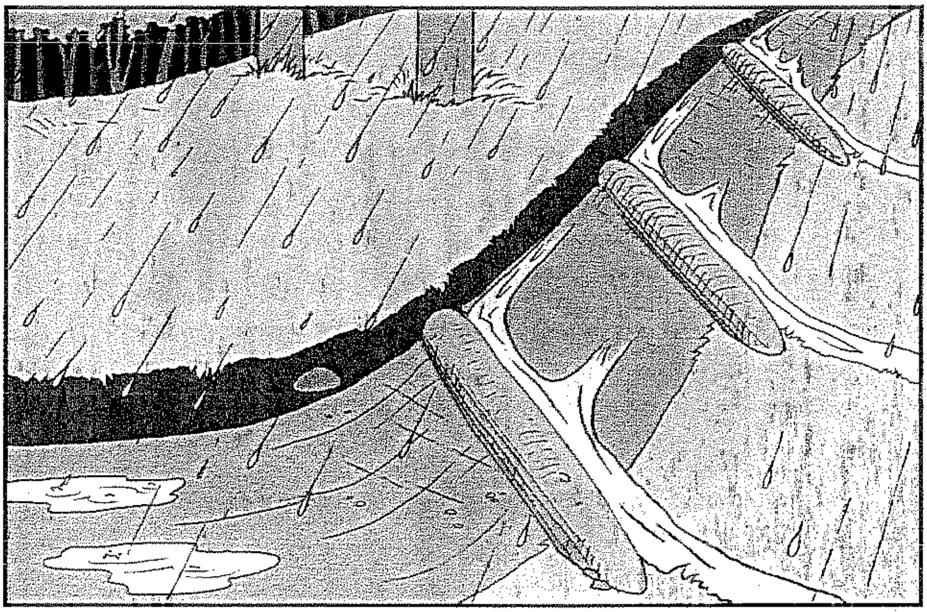
- Adequate amount of layered corduroy to protect soil from rutting
- Approaches are protected from rutting by extension of corduroy beyond edges of crossing
- Flow is maintained and water is clear of mud and silt

WATER BARS



IMPROPER INSTALLATION

- Flow directed to uphill side on upper bar
- Angle of lower bar is too shallow
- Lower bar does not extend far enough, allowing water to escape around ends
- Bars are not high enough, allowing water to flow over top, eroding them



PROPER INSTALLATION

- Bars are at moderate angles
- There are enough bars to divert all water flowing down road
- Bars are high enough to prevent water from flowing over them
- Bars extend beyond edges of road, preventing water from flowing around them

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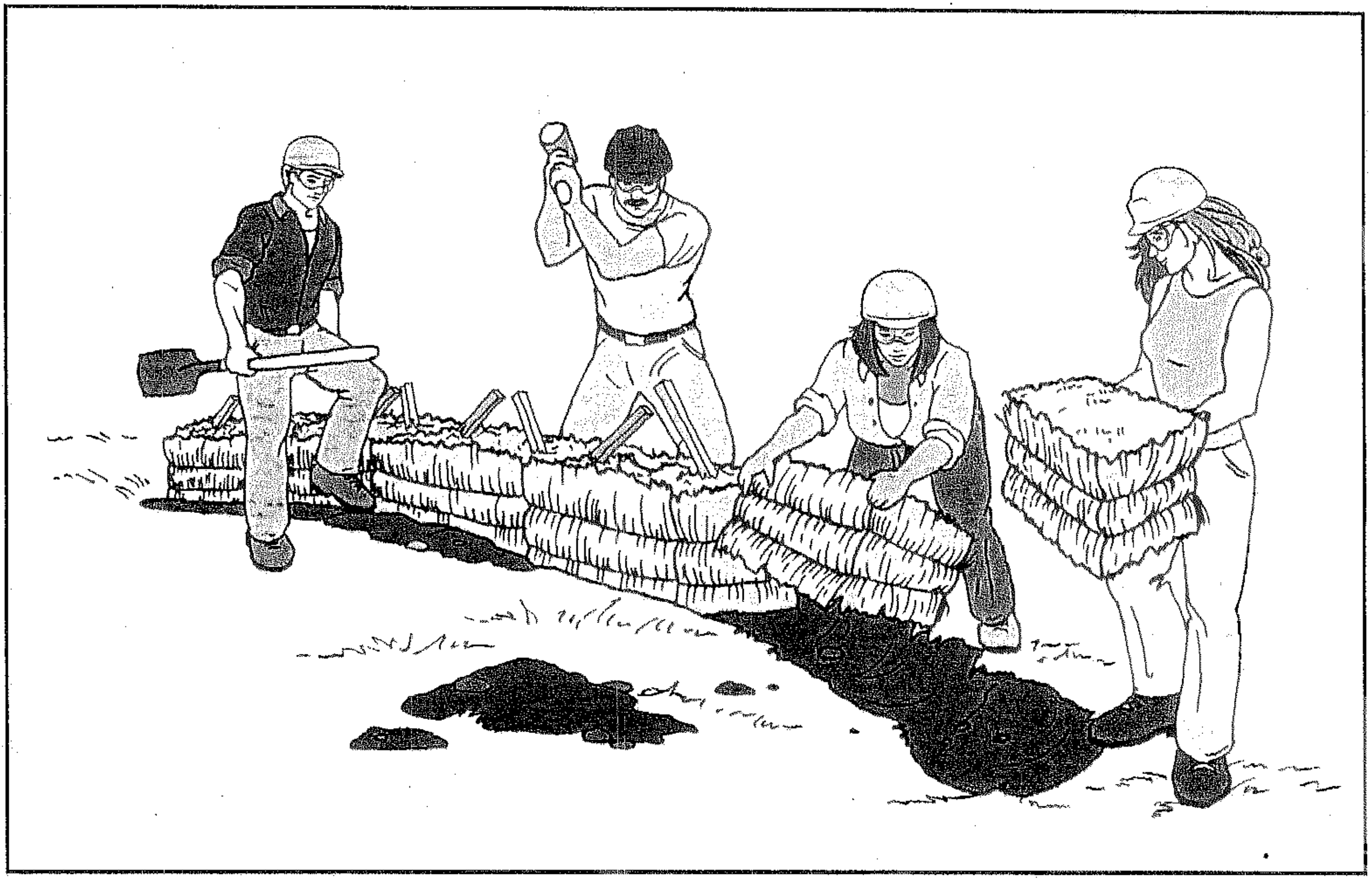
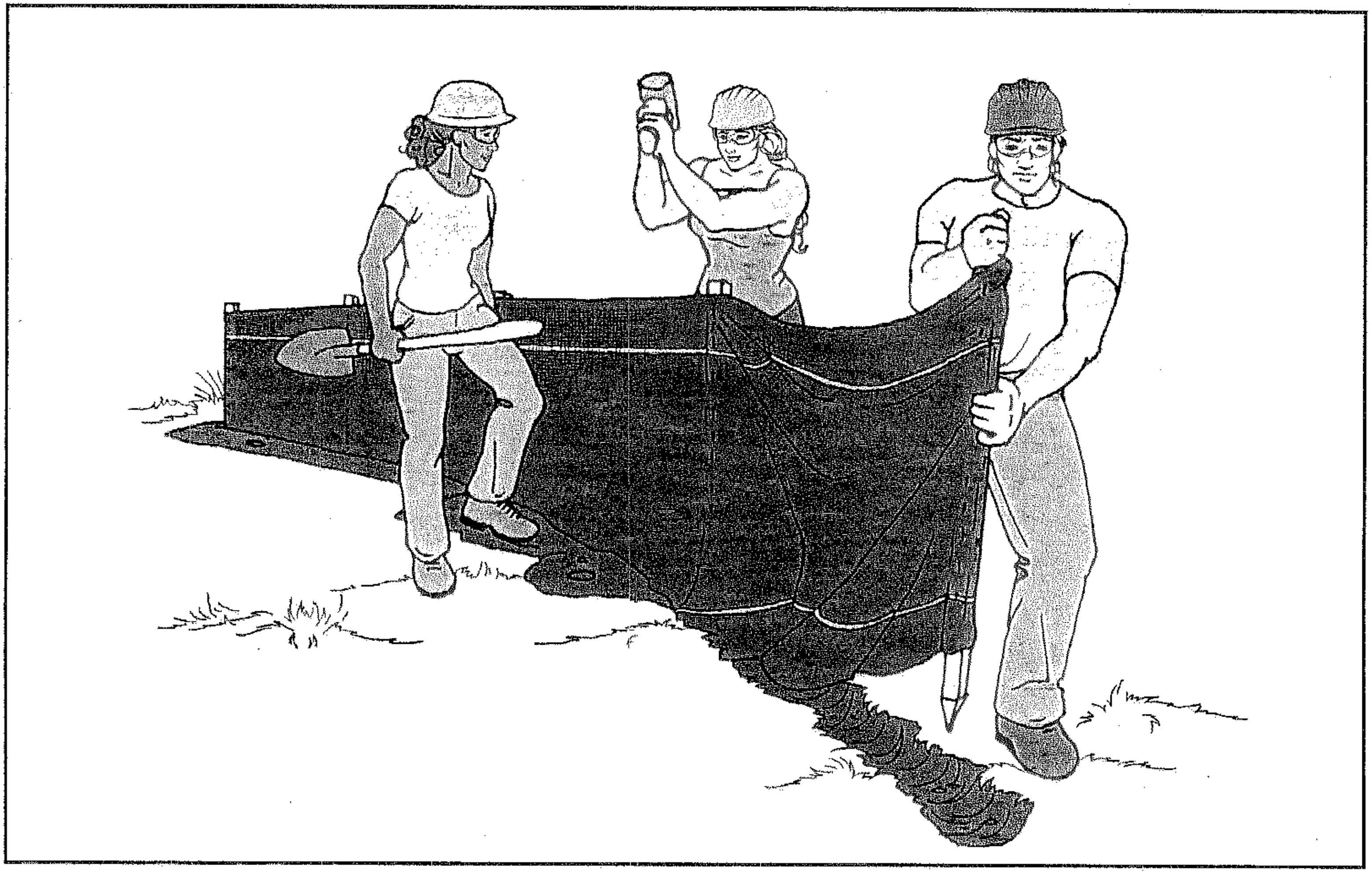
SEDIMENT BARRIER – HAY BALES
PROPER INSTALLATION



- Dug trench to key bales into ground
- Stakes placed and driven in at angles to snug bales together
- Excess dirt used to cover openings and cracks

SEDIMENT BARRIER – SILT FENCE
PROPER INSTALLATION



- Dug trench to key material into ground
- Stakes are placed facing away from disturbed area
- **Excess material on bottom is buried with excess dirt to prevent water from flowing under fence**

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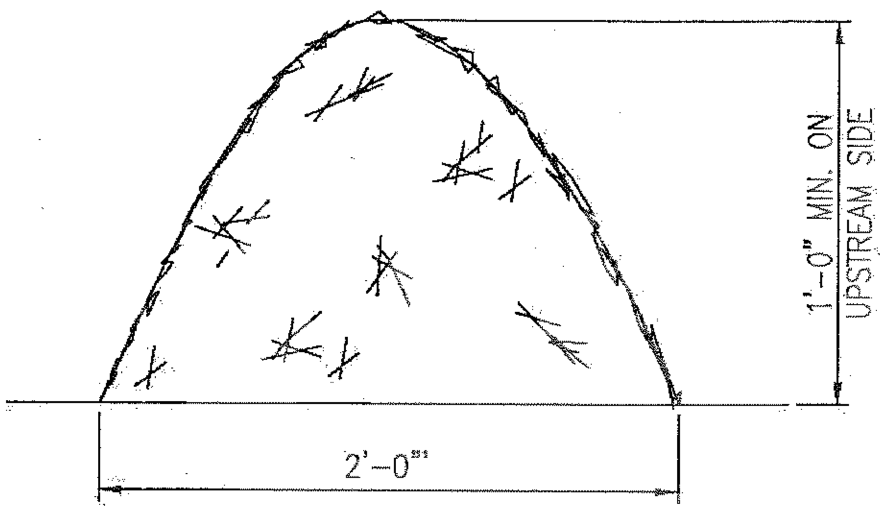
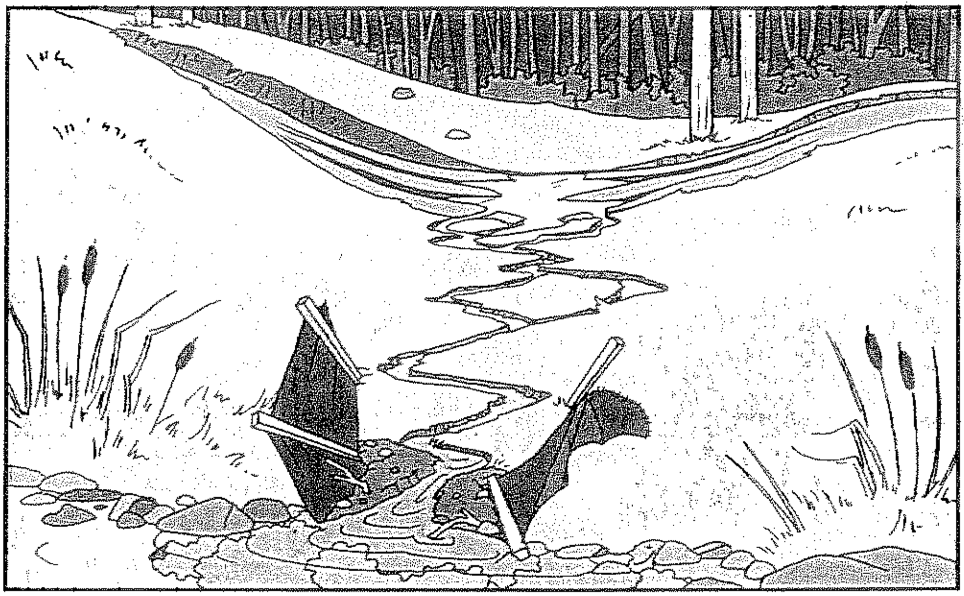
EROSION CONTROL MIX BERM DETAIL



- Use erosion control mix berm in place of silt fence and/or hay bale sediment barriers
- Erosion control soil/bark mix shall consist of: shredded bark, stump grindings, composted bark or flume grit and fragmented wood generated from water-flume log handling systems. The mix shall conform to the following:

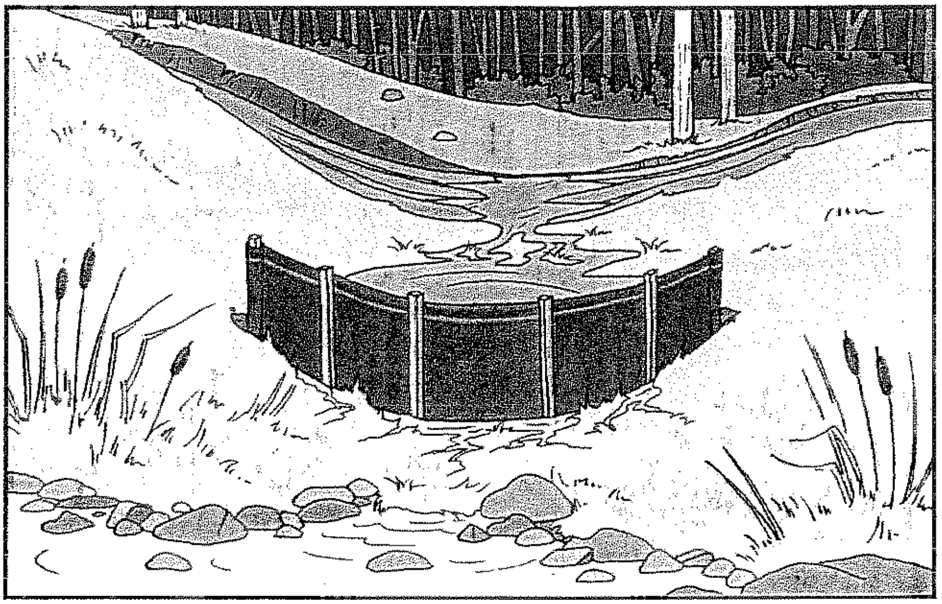
1. pH: 5.0 to 8.0
2. Screen Size: 6" – 100% passing
   ¾" – 70% to 85% passing
   Mix shall not contain large portions of silts, clays or fine sands
3. Organic material: 20% - 100% (dry weight basis)
   Organic portion must be fibrous and elongated
4. Soluble salts shall be <4.0 mmhos/cm

SEDIMENT BARRIER – SILT FENCE



IMPROPER INSTALLATION

- Fence located too far from road and too close to resource
- Stakes installed on wrong side of fence
- Needs maintenance (restaking, restapling, or even replacement)
- Placed in concentrated flow



PROPER INSTALLATION

- Adequate distance from road and resource allows road to capture and slow water, and allows silt fence to filter it before reaching resource
- Stakes placed on correct side; facing resource, while filter fabric faces disturbed area
- Adequate length; fence is long enough and turned uphill at ends to prevent water from escaping around edges

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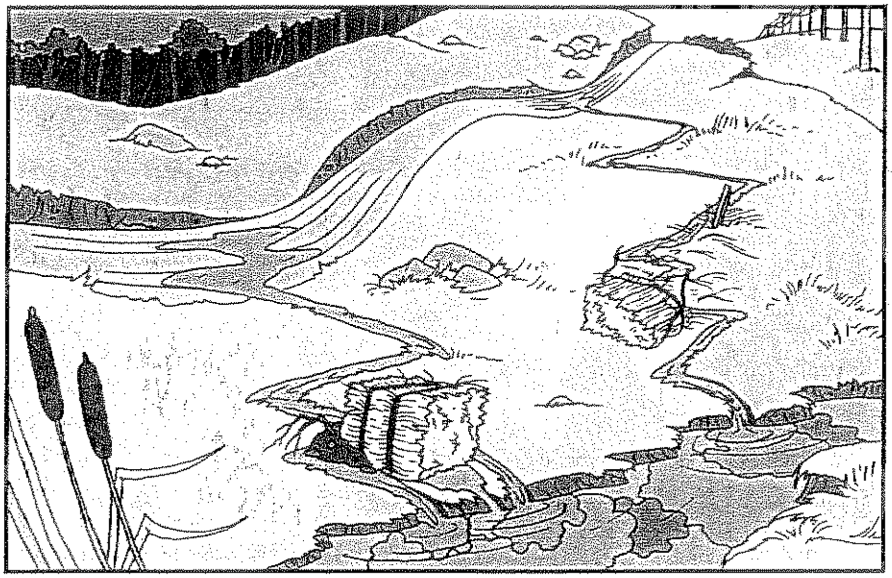
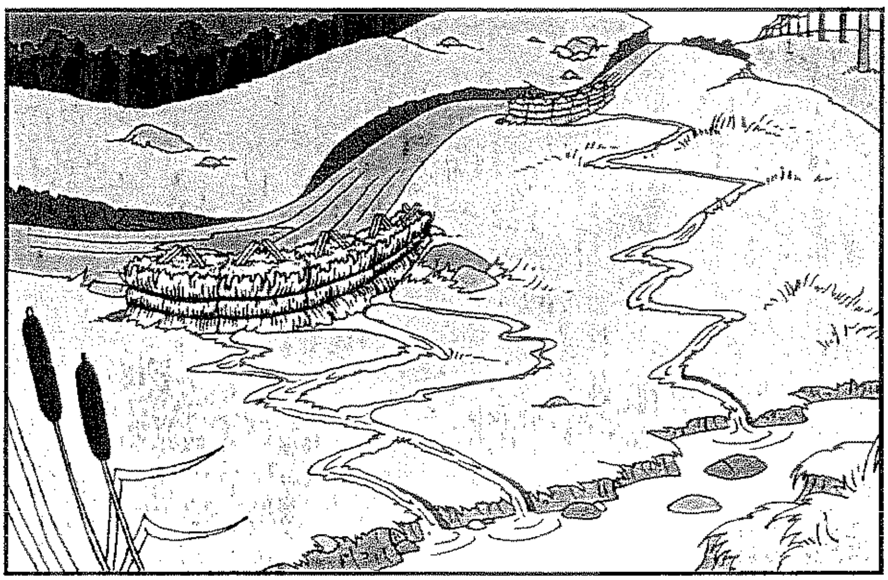
SEDIMENT BARRIER – HAY BALES



IMPROPER INSTALLATION

- Placed in concentrated flow
- Hay bales are not staked
- Not enough hay bales to adequately capture and slow flow
- Too far from source of runoff and sediment
- Improper orientation of bales; horizontal grass fibers do not provide adequate filtration, and strings on ground rot and bales to fall apart



PROPER INSTALLATION

- Staked properly; bales are secure and snug to one another
- Sufficient number of bales to slow flow and insure that no water escapes around edges
- Positioned close to disturbance, and far from resource to allow proper filtration
- Vertical orientation of grass fibers provides adequate filtration
- Placed along contour to capture sheet flow

APPENDIX E

EROSION AND SEDIMENTATION CONTROL LAW* 38 M.R.S.A. § 420-C

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APPENDIX E

EROSION AND SEDIMENTATION CONTROL LAW*

38 M.R.S.A. § 420-C

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in section 480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken and the site must be maintained to prevent unreasonable erosion and sedimentation.

This section applies to a project or any portion of a project located within and organized area of this State. This section does not apply to agriculture fields. Forest management activities, including associated road construction or maintenance, conducted in accordance with applicable standards of the Maine Land Use Regulation Commission, are deemed to comply with this section. This section may not be construed to limit a municipality's authority under home rule to adopt ordinances containing stricter standards than those contained in this section.

* The Erosion and Sedimentation Control Law is administered by the Maine Department of Environmental Protection (MDEP), Augusta, Maine. Please contact the MDEP with specific questions regarding this law.

APPENDIX F

MAINE SLASH LAW* 12 M.R.S.A. § 9333

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APPENDIX F

MAINE SLASH LAW*

12 M.R.S.A § 9333

§9333. Disposal along railroad and utility lines

*1. **Stumpage owner**. A stumpage owner, operator, landowner or agent who cuts or causes or permits to be cut any forest growth on lands that are within or border the right-of-way of a railroad, a pipeline, or an electric power, telegraph, telephone or cable line may not place slash or allow it to remain on the ground within the right-of-way or within 25 feet of the nearer side of the right-of-way.*

*2. **Construction**. Slash accumulated by the construction and maintenance of a railroad, a highway, a pipeline or electric power, telegraph, telephone or cable line may not be left on the ground but must be hauled away, burned or chipped. Slash may not be left or place within the right-of-way or within 25 feet of the nearer side of the right-of-way. If a burning permit is denied or revoked under this chapter, the director may allow logs that are too large to be chipped to remain in the right-of-way until the director determines that their removal is economically feasible.*

*3. **Utility line maintenance**. Slash accumulated by the periodic maintenance of a pipeline or an electric power, telegraph, telephone or cable line may be disposed of in the following manner.*

- *A. Slash with a diameter of 3 inches or less may be left in piles on the ground within the maintained portion of the right-of-way. A pile may not be higher than 18 inches from the ground or longer than 50 feet and must be separated from other piles by a minimum of 25 feet in every direction. A buffer strip with a minimum width of 10% of the total width of the maintained right-of-way must be kept totally free of slash with a diameter of 3 inches or less.*
- *B. Slash with a diameter of more than 3 inches must be removed, chipped or limbed and placed on the ground surface. The pieces must be separated and may not be piled one piece over another. Slash of this size may be left within the maintained buffer strips.*
- *C. If a utility line right-of-way is adjacent to a road, slash that is 3 inches or less in diameter must be removed, burned or chipped. Slash with a diameter of more than 3 inches may be left on the ground within the right-of-way and must not be limbed and separated and may not be piled one piece over another. Usable timber products generated from the maintenance of a utility right-of-way may be piled within the right-of-way but must be removed within 30 days.*

* Note that this is an excerpt from the full text of the law. Please contact the Maine Forest Service, Augusta, Maine, for the full text of the law or with specific questions regarding the Slash Law.

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APPENDIX G

CULVERT SIZES FOR STREAM CROSSINGS

(3X RULE)

CULVERT SIZES (ROUND) FOR STREAM CROSSINGS (3x RULE)

AVERAGE STREAM WIDTH

Take two measurements across the stream from bank to bank where you intend to place the culvert. Measurements should be taken at the normal high water line (NHWL). To find the NHWL during low flow periods look for water stains on rocks or a debris line along the bank. Add the first measurement to the second and divide this number by 2. This equals the average stream width.
Example: 36in. + 47 in. = 83in. 83÷2 = avg. stream width of 41.5 inches. (Round up to 42in.)

AVERAGE STREAM DEPTH

Take 3 measurements from the bottom of the stream to the NHWL.
Add the measurements together and divide this number by 3. This equals the avg. stream depth.
Example: 12in. + 16in. + 14in. = 42in. 42÷3 = average stream depth of 14 inches.

USING THE TABLE

Take the average width and depth figures and determine where they intersect on the table above. *For example, for an average stream width of 42 inches (on the left side of the table), and an average stream depth of 14 inches (along the top of the table), the intersect shows a culvert diameter of 48 inches.

Average Stream Width			Average Stream Depth (Inches)														
Feet	Inches		2	4	6	8	10	12	14*	16	18	20	22	24	26	28	30
1	12		12	15	18	21	21	24	30	30	30	30	36	36	36	36	42
1.5	18		12	18	21	24	30	30	36	36	36	42	42	42	42	48	48
2	24		15	21	24	30	30	36	36	42	42	48	48	48	54	54	54
2.5	30		15	21	30	30	36	42	42	48	48	48	54	54	60	60	60
3	36		18	24	30	36	42	42	48	48	54	54	60	60	60	66	66
3.5	42*		18	30	36	36	42	48	**48**	54	54	60	60	66	66	72	72
4	48		21	30	36	42	48	48	54	54	60	66	66	66	72	72	78
4.5	54		21	30	36	42	48	54	54	60	66	66	72	72	78	78	84
5	60		21	30	42	48	48	54	60	66	66	72	72	78	78	84	84
5.5	66		24	36	42	48	54	60	60	66	72	72	78	78	84	84	90
6	72		24	36	42	48	54	60	66	66	72	78	78	84	90	90	96
6.0	78		24	36	42	54	60	60	66	72	78	78	84	90	90	96	96
7	84		30	36	48	54	60	66	72	72	78	84	84	90	96	96	102
7.5	90		30	42	48	54	60	66	72	78	84	84	90	96	96	102	102
8	96		30	42	48	54	66	66	72	78	84	90	90	96	102	102	108
8.5	102		30	42	48	60	66	72	78	84	84	90	96	102	102	108	108
9	108		30	42	54	60	66	72	78	84	90	96	96	102	108	108	114
9.5	114		30	42	54	60	66	72	78	84	90	96	102	102	108	114	114
10	120		30	48	54	66	72	78	84	90	96	96	102	108	114	114	120
10.5	126		36	48	54	66	72	78	84	90	96	102	108	108	114	120	120
11	132		36	48	60	66	72	78	84	90	96	102	108	114	114	120	126
11.5	138		36	48	60	66	78	84	90	96	102	108	108	114	120	126	126
12	144		36	48	60	66	78	84	90	96	102	108	114	120	120	126	132
12.5	150		36	48	60	72	78	84	90	96	102	108	114	120	126	132	132
13	156		36	54	60	72	78	90	96	102	108	114	114	120	126	132	138
13.5	162		36	54	66	72	84	90	96	102	108	114	120	126	132	132	138
14	168		36	54	66	72	84	90	96	102	108	114	120	126	132	138	144
14.5	174		36	54	66	78	84	90	96	108	114	120	126	126	132	138	144
15	180		42	54	66	78	84	96	102	108	114	120	126	132	138	144	144

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State Agency Review Comments

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TECHNICAL REVIEW MEMORANDUM

Division of Watershed Management – Engineering Unit

TO: Dawn Hallowell – Project Manager, Division of Land Resource Regulation

FROM: Art McGlauflin – Engineer, Division of Watershed Management

DATE: January 14, 2010

SUBJECT: L-24620-24-A-N, Erosion and Sediment Control for the MPRP Construction

As you asked, I have reviewed the proposed erosion and sediment control plan for the construction, expansion, and upgrades to Central Maine Power Company's transmission line system as part of the Maine Power Reliability Project. I have just a few comments regarding the methods, standards, and specifications presented.

1. The restoration standards (section 9.0) should be revised to include provisions for the removal, stockpiling, and replacement of topsoil on areas disturbed but not developed as part of the project's construction. The submitted document has the replacement of the native topsoil (i.e., restoration of the disturbed area using the topsoil taken from that area) limited to wetland areas. The reuse of the native topsoil should also apply to upland areas. The standard should include specifications for topsoil removal, stockpiling, and replacement. The topsoil should be removed and kept separate from the underlying mineral soil. Stockpiling should be done outside of wetlands, areas of concentrated flow, and areas prone to flooding. Minor stockpiles can be placed on a tarp and protected by an overlying tarp anchored with stones, sandbags, tree limbs, etc. Large stockpiles should be surrounded by a temporary sediment barrier and either mulched (if to be left in place less than 90 days) or seeded and mulched (if to be left in place more than 90 days). Redistribution of the topsoil over the disturbed area should be to the same thickness as the original topsoil depth.

2. Item 7 in Section 9.2 should be rewritten to require restoration of <u>all</u> disturbed areas not developed as part of the project. This includes the restoration of all areas disturbed by pole installation efforts, temporary access roadways, permanent access roadways, substation construction efforts, and resource crossings. Restoration is generally assumed to be to a well-established vegetative cover. All cut and fill slopes must be revegetated, stabilized with riprap, or stabilized with erosion control mix, as appropriate to the slope conditions.

3. The definition of "temporary access road" should be rewritten to require the stabilization of all areas disturbed by the access road's construction and use. This includes stabilizing the road's ditches, travel way, and slopes back to vegetated conditions. In most cases, any roadway ditches associated with the temporary access road should be refilled to re-establish the pre-development drainage conditions.

4. Item 5 in section 9.2 should be rewritten to indicate a Central Maine Power Company's environmental specialist will designate where water bars (or any other erosion controls) will be located, oriented, etc. The third-party inspector required by MDEP is only responsible for

inspecting the construction sites for compliance with the erosion control plans/adherence to proper practices and for notifying MDEP and CMP of areas of non-compliance/problems. CMP environmental personnel must devise solutions and direct the efforts of the contractor at eliminating the problems identified.

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From: Dominie, David (Augusta,ME-US) [ddominie@trcsolutions.com]
Sent: Friday, January 29, 2010 3:10 PM
To: Hallowell, Dawn
Cc: mary.smith@cmpco.com; Thomas Doyle; Ed Beene; Lychwala, Michael (S.Portland,ME-US); Leclerc, Lauren G. (Augusta,ME-US)
Subject: Art McGlauflin's Erosion Control Issues

Dawn –

Here are our responses to the items that Art McGlauflin raised in his memo.

1. The restoration standards (section 9.0) should be revised to include provisions for the removal, stockpiling, and replacement of topsoil on areas disturbed but not developed as part of the project's construction. The submitted document has the replacement of the native topsoil (i.e., restoration of the disturbed area using the topsoil taken from that area) limited to wetland areas. The reuse of the native topsoil should also apply to upland areas. The standard should include specifications for topsoil removal, stockpiling, and replacement. The topsoil should be removed and kept separate from the underlying mineral soil. Stockpiling should be done outside of wetlands, areas of concentrated flow, and areas prone to flooding. Minor stockpiles can be placed on a tarp and protected by an overlying tarp anchored with stones, sandbags, tree limbs, etc. Large stockpiles should be surrounded by a temporary sediment barrier and either mulched (if to be left in place less than 90 days) or seeded and mulched (if to be left in place more than 90 days). Redistribution of the topsoil over the disturbed area should be to the same thickness as the original topsoil depth.

Response: **CMP intends to segregate the topsoil in areas where it will be most effective, to enhance revegetation and minimize the time that disturbed areas will be vulnerable to erosion. There will, however, be areas where this practice is not practicable, such as on steep slopes or areas of exposed ledge. Moreover, it is also impracticable for the majority of the pole placements and guy anchors, in which the excavated area is small and largely filled in by the structure itself. Finally, it is impracticable to stockpile topsoil outside of wetlands because the process of transporting the soil out of the wetland frequently causes greater impacts to the wetland from additional vehicle traffic and inevitably results in the loss of some valuable topsoil, which, if stored in the wetland itself, would be avoided.**

Accordingly, the following will be added to supplement Item 1 in Section 9.2 of CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects: "Wherever practicable, to facilitate the regeneration of natural vegetation within and adjacent to protected natural resources, during the construction of substations, pull sites, and roads that causes soil disturbance, topsoil will be separated from the mineral soil when excavating and stockpiled outside areas of concentrated flow and areas prone to flooding, and handled in accordance with Section 3.3 Construction in Wetlands of CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects. The excavated topsoil will be replaced in close proximity to its origin and to a depth sufficient to support vegetative growth."

2. Item 7 in Section 9.2 should be rewritten to require restoration of <u>all</u> disturbed areas not developed as part of the project. This includes the restoration of all areas disturbed by pole installation efforts, temporary access roadways, permanent access roadways, substation construction efforts, and resource crossings. Restoration is generally assumed to be to a well-established vegetative cover. All cut and fill slopes must

be revegetated, stabilized with riprap, or stabilized with erosion control mix, as appropriate to the slope conditions.

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Response: Item 7 in Section 9.2 of CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects will be changed to read as follows:
Upon completion of the project, all disturbed areas will be permanently revegetated or otherwise permanently stabilized. This includes the restoration of all areas disturbed by pole installation efforts, temporary access roadways, permanent access roadways, substation construction efforts, and resource crossings. Restoration is generally assumed to be to a well-established vegetative cover. All cut and fill slopes must be revegetated, stabilized with riprap, or stabilized with erosion control mix, as appropriate to the slope conditions.

3. The definition of "temporary access road" should be rewritten to require the stabilization of all areas disturbed by the access road's construction and use. This includes stabilizing the road's ditches, travel way, and slopes back to vegetated conditions. In most cases, any roadway ditches associated with the temporary access road should be refilled to re-establish the pre-development drainage conditions.

Response: The definition of temporary access roads as contained in Appendix A DEFINITION OF TERMS in CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects will be changed to read as follows:
Temporary access road: Road constructed solely for project access which is restored to original grade upon project completion, if not sooner. All areas disturbed by the access road's construction and use will be stabilized including the road's ditches, travel way, and slopes back to vegetated conditions. In most cases, any roadway ditches associated with the temporary access road should be refilled to re-establish the pre-development drainage conditions.

4. Item 5 in section 9.2 should be rewritten to indicate a Central Maine Power Company's environmental specialist will designate where water bars (or any other erosion controls) will be located, oriented, etc. The third-party inspector required by MDEP is only responsible for inspecting the construction sites for compliance with the erosion control plans/adherence to proper practices and for notifying MDEP and CMP of areas of non-compliance/problems. CMP environmental personnel must devise solutions and direct the efforts of the contractor at eliminating the problems identified.

Response: Item 5 in Section 9.2 of CMP's Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects will be changed to read as follows:
Previously installed water bars may remain or new ones will be installed at locations designated by CMP or their designated representative. To prevent accelerated soil erosion, such water bars will be installed on all access and construction roads to be closed to vehicle traffic and on steep sections of permanent roads. Permanent water bars will be constructed to a sufficient height and width to divert the amount of water anticipated at each location as well as to provide some post-project permanence to the site. Water bars on permanent roads will be constructed in such a manner that they will remain effective and require minimal maintenance, and will be permanently seeded to ensure their long-term stability.

Please let me know if you have any questions regarding this response.

508 MAINE POWER
RELIABILITY PROGRAM
A CENTRAL MAINE POWER COMPANY PROGRAM
WWW.MAINEPOWER.COM

November 13, 2009

Ms. Dawn Hallowell
Maine Department of Environmental Protection
312 Canco Road
Portland ME 04103

RE: MPRP Proposed List of Third-Party Inspection Candidates (DEP File #L-24620)

Ms. Hallowell:

As requested, Central Maine Power (CMP) hereby presents a list of candidates proposed for the Maine Department of Environmental Protection's (MDEP) Third-Party Inspection Program on the Maine Power Reliability Program. All of the candidates have been pre-screened based on the following criteria:

- overall experience
- experience as an environmental inspector
- experience in Maine as a Third-Party Inspector

We are confident that any of the individuals in the attached resumes will provide excellent service to the MDEP. The candidates and their respective firms, in no particular order, are as follows:

- Boyle and Associates – Rich Jordan, Rodney Kelshaw, Heather Ward
- Engineering Assistance and Design, Inc. - Ross Cudlitz
- HDR – Stephen Roberge
- Tetra Tech – Brian Rod, Lindsay Eiser

Given the size and duration of the project, we are seeking MDEP's approval for multiple candidates so that we can begin negotiating terms and conditions with the approved candidates' representative company. We propose to establish a pool from which to draw, and will not necessarily be using all of the candidates throughout the entire project. Please let me know if you have any questions or need additional information in your consideration of the above referenced individuals.

Sincerely,

Mary Smith

Mary Smith
Project Manager - Maine Power Reliability Program

cc: Gerry Mirabile, CMP
David Dominie, TRC
Tom Doyle, Pierce Atwood
Edward Beene, BMcD
File

attachments

From: Lychwala, Michael (S.Portland,ME-US) [MLychwala@TRCSOLUTIONS.com]
Sent: Thursday, January 21, 2010 10:44 AM
To: Hallowell, Dawn; Dominie, David (Augusta,ME-US); Smith, Mary R.; Thomas Doyle
Cc: Richardson, Marybeth; Callahan, Beth; Jay.L.Clement@nae02.usace.army.mil
Subject: RE: CMP MPRP IWWHs and aviation bird balls

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Attachments: MPRP 325B_Map Packet.pdf; MPRP 319B_Map Packet.pdf

Dawn,

Attached is some additional mapping for both the Penobscot River and Fields Pond outlet crossing locations that may help with the review. We developed some basic maps at various scales to help identify trees within the proposed clearing limits. We also included mapping that shows the basic layout of the proposed transmission lines to illustrate why the clearing will be necessary. If there are any questions regarding the mapping please do not hesitate to contact me.

Thanks,

Michael Lychwala
cid:image00
400 Southborough Drive
South Portland, Maine, 04106

207.879.1930 ext. 119 phone
207.879.9293 fax
207.232.1739 cell
mlychwala@trcsolutions.com

From: Lychwala, Michael (S.Portland,ME-US)
Sent: Tuesday, January 19, 2010 4:54 PM
To: 'Hallowell, Dawn'; Dominie, David (Augusta,ME-US); Smith, Mary R.; Thomas Doyle
Cc: Richardson, Marybeth; Callahan, Beth; Jay.L.Clement@nae02.usace.army.mil
Subject: RE: CMP MPRP IWWHs and aviation bird balls

Dawn,

We will develop some aerial based figures at a better scale to see if we can narrow down the specific trees in question. Unfortunately, as you know, capable trees and powerlines do not mix, so capable trees within the MPRP corridor will need to be cut. CMP's use of the existing corridor at these two crossings will minimize the amount of capable trees that are removed, so route modifications would only increase clearing. That being said, we can take a closer look at these two crossing locations, perhaps with Charlie in the spring once his knee gets better, and see if there is anything that can be done to retain some of the favorite perch trees if they are found within the impact area. However, options are limited when in vicinity of the lines. Therefore, if favorite perch trees are removed we can work with Charlie and USFWS on the mitigation measures such as marker balls and perching deterrents.

Michael Lychwala
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400 Southborough Drive
South Portland, Maine, 04106

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207.879.9293 fax
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mlychwala@trcsolutions.com

From: Hallowell, Dawn [mailto:Dawn.Hallowell@maine.gov]
Sent: Tuesday, January 19, 2010 1:31 PM

To: Lychwala, Michael (S.Portland,ME-US); Dominie, David (Augusta,ME-US); Smith, Mary R.; Thomas Doyle
Cc: Richardson, Marybeth; Callahan, Beth; Jay.L.Clement@nae02.usace.army.mil
Subject: FW: CMP MPRP IWWHs and aviation bird balls

5/8

Mike, please see Charlie Todd's email below.

Is it possible to retain a couple of these favorite perch trees?

Jay – I'm copying you too – sounds like something US Fish might like to hear about.

Thanks,

Dawn Hallowell
Maine DEP
312 Canco Rd
Portland ME 04103
Phone: 207-822-6324
Fax: 207-822-6303
Email: Dawn.Hallowell@maine.gov

From: Todd, Charlie
Sent: Tuesday, January 19, 2010 1:20 PM
To: Hallowell, Dawn; Timpano, Steve
Cc: Connolly, James; Schaeffer, Thomas; Allen, Brad
Subject: RE: CMP MPRP IWWHs and aviation bird balls

Steve, Dawn: The references to "no removal at ... foraging perches" along Segment 1 in Orrington and Winterport was not intended to be a broad prohibition against clearings. It was a safeguard to protect 2 – 3 specific trees at each crossing that are regularly used by perching eagles in all seasons.

My interpretation of Mike's attachment does imply a potential loss of the 5 perch trees in question if the pink shading south of the Penobscot River line crossing in Winterport and west of the Fields Pond outlet crossing in Orrington implies removal of all trees. The following details on specific perch trees meriting protection may be helpful to that determination:

Orrington: Fields Pond outlet crossing of Segment 1:

- a supercanopy pine within 50 yards west of the line on south shore of the outlet = used almost daily by eagles residing in nearby nest #319B and one of relatively few potential nest trees locally.
- a shoreline oak within on the north shore of the outlet = a frequent foraging perch for local eagles.

Winterport: Penobscot River crossing of Segment 1:

- 3 large pines within 75 yards south of the existing line on the western shore of the river = often used by resident and transient eagles, especially in mid-summer and in mid-winter.

We can mark the trees, if necessary, but I'm on hold for knee surgery in March so a site visit might not be feasible for me personally until spring. If the applicant can generate high-resolution images of these crossings at a scale ~ 1:6,000 then it may be possible to delineate them on a color photo. Alternatives to maintenance of these 5 perch trees can also be discussed:

- For instance, if regularly used perches are removed along the line then deterrents installed on the pole / tower configurations may be necessary since there's some likelihood of eagles using them as a substitute for the loss of favorite perches.
- Extra line markers near these towers (instead of typical mid-span configurations) may be advisable.

If this clarification is still problematic for MPRP, it may be appropriate to consult federal agencies that will be re-evaluating such issues under their jurisdictions. Take prohibitions (against death or injury) are administered solely by the U.S. Fish and Wildlife Service under the Bald Eagle – Golden Eagle Protection Act.

The loss of a perch tree is not a significant adverse impact in most eagle habitats across Maine. However, the regularity of use and proximity to the existing corridor combine to yield jeopardy of "take" (death or injury) should eagles try to perch on the tower or pole at each site in the event these trees are removed. Eagles will perch on transmission line towers at some localities in Maine, and there are documented eagle injuries and deaths at a few. The regularity of eagle use at these perches along the existing line in Orrington and Winterport amplifies risks.

Charlie Todd
Wildlife Biologist
Maine Dept. of Inland Fisheries and Wildlife
650 State Street
Bangor, ME 04401
tel. (207) 941-4468
FAX (207)941-4450

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From: Hallowell, Dawn
Sent: Tuesday, January 19, 2010 11:42 AM
To: Timpano, Steve; Todd, Charlie
Subject: FW: CMP MPRP IWWHs and aviation bird balls

Thank you for sending your comments regarding the avian markers for CMP's MPRP project. I've received a question from the applicant's consultant regarding the crossings associated with two bald eagle habitats. Please see below. Can you tell me if the proposed clearing is acceptable to IF&W?

Thank you!

Dawn Hallowell

Maine DEP
312 Canco Rd
Portland ME 04103
Phone: 207-822-6324
Fax: 207-822-6303
Email: Dawn.Hallowell@maine.gov

From: Lychwala, Michael (S.Portland,ME-US) [mailto:MLychwala@TRCSOLUTIONS.com]
Sent: Thursday, January 14, 2010 1:47 PM
To: Hallowell, Dawn
Cc: Beene, Ed; Dominie, David (Augusta,ME-US)
Subject: RE: CMP MPRP IWWHs and aviation bird balls

Hi Dawn,

I had a quick question about the e-mail Steve Timpano sent you which contained some information about eagles. The question is about the second recommendation;

2) No overstory removal at specific Bald Eagle nests or foraging perches in close proximity to an existing right-of-way at these sites:

ROW segment	Township(s)	BAEA Nest #	Habitat Concern
01	Orrington	319B	diurnal perches
01	Winterport	325B	diurnal perches
16	Bowdoinham	009E, 009F	core nest buffer + diurnal perches
34A	Benton	278A, 278B	core nest buffer + diurnal perches

For Segments 16 and 34A , we do not have any tree clearing proposed in the areas around the nest or perch sites so there is no issue. However, along Segment 1, there are two mapped areas outside of the corridor (greater than ¼ mile from the corridor). The recommendation is "No overstory removal at... ...foraging perches in close proximity to an existing right-of-way... ". We have tree clearing associated with Segment 1. Although we are outside of the designated essential habitat for sites 319B (Fields Pond) and 325B (Penobscot River), there will be tree clearing required to expand the existing corridor and install the new lines across the associated waterbodies (see attached map). Therefore, if the requirement is to have no tree clearing at these two crossings then we have an issue because CMP would not be able to successfully build the MPRP. I'm not sure if that is the intent of this condition or not, - we could use some clarification on the wording "close proximity to an existing right-of-way... ". If we are more than ¼ mile away does that mean we are not in close proximity? – I'm assuming these two specific sites were listed because they were determined to be close to the corridor – but I need to check. 5/2

Hopefully that all makes sense – it's a bit hard to describe in an e-mail. If you need some clarification please do not hesitate to give me a call. Hopefully the map will also help. The map shows the Segment 1 corridor and the proposed clearing is shaded.

Thanks,

Michael Lychwala
cid:image00
400 Southborough Drive
South Portland, Maine, 04106

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207.879.9293 fax
207.232.1739 cell
mlychwala@trcsolutions.com

From: Dominie, David (Augusta,ME-US)
Sent: Tuesday, January 12, 2010 11:07 AM
To: Beene, Ed; Goodwin, Mark; Lychwala, Michael (S.Portland,ME-US)
Subject: FW: CMP MPRP IWWHs and aviation bird balls

FYI

David R. Dominie
Senior Environmental Specialist
TRC Companies, Inc.
14 Gabriel Drive
Augusta, ME 04330

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207.485-7136 cell
ddominie@trcsolutions.com
-----Original Message-----
From: Hallowell, Dawn [mailto:Dawn.Hallowell@maine.gov]
Sent: Tuesday, January 12, 2010 10:00 AM
To: Smith, Mary R.; Dominie, David (Augusta,ME-US); Thomas Doyle
Cc: Richardson, Marybeth; Woods, Melanie R
Subject: FW: CMP MPRP IWWHs and aviation bird balls

Well here's the response regarding the avian markers. If I recall correctly you had asked in your responses to the Veg Stds if we could identify these areas ahead of time.

Let me know what you think.

Dawn Hallowell

Maine DEP

312 Canco Rd

Portland ME 04103

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Fax: 207-822-6303

Email: Dawn.Hallowell@maine.gov

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From: Timpano, Steve
Sent: Thursday, January 07, 2010 4:41 PM
To: Hallowell, Dawn
Cc: Cassida, James; Stadler, Mark
Subject: FW: CMP MPRP IWWHs and aviation bird balls

Dawn;

Please see response below to your request for identification of IWWH's where aviation marker balls should be required. Recommendations from Charlie Todd for aviation marker balls on river and stream crossings with eagle concerns are also included below.

Steve T.

IWWH - Bird Diverters or Aviation Marker Balls

After consultation with WRAS staff the conclusion is to not modify our previous Performance Standards recommendations to DEP:

"I. Where overhead transmission lines cross an IWWH area, the permittee must install bird diverters or aviation marker balls according to manufacturer's guidelines and applicable transmission line codes unless otherwise determined to be impracticable by the department in consultation with MDIFW. If aviation markers are used, colors must alternate between yellow/white (for dark and cloudy conditions) and red (for bright and sunny conditions). The use of other methods may be considered in consultation with MDIFW."

DEP has informed CMP of these standards as applicable to the MPRP. They apply to all IWWH's deemed Significant Wildlife Habitats under the NRPA (all IWWH's ranked moderate or high value). Bird diverters or aviation marker balls are to be installed at all "unless otherwise determined to be impracticable by the department in consultation with MDIFW." Under this guidance, there are no provisions for advance identification of specific IWWH's where bird diverters or aviation marker balls should be installed. We are willing to discuss "unless otherwise determined to be impracticable" with DEP.

Bald Eagle - Aviation Marker Balls

CMP RELIABILITY PROJECT – BALD EAGLE CONDITIONS

Searches for nesting Bald Eagles were conducted during aerial surveys conducted jointly by MDIFW and TRC biologists in April, 2009. The following are offered as recommended conditions for a Site Law permit. They reflect traditional Essential Habitat review standards. Applicants should also review national management guidelines (see http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuideli and consult with USFWS on liabilities (see http://www.fws.gov/northeast/EcologicalServices/eagle/guidelines/index.html).

1. Aviation ball markers (or comparable utility standards deployed as line collision deterrents) are installed on shield wires at the following water crossings:

ROW segment	Township(s)	Water body
01	Orrington	Fields Pond outlet
01	Orrington, Winterport	Penobscot River

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01 Frankfort, Winterport Marsh Stream
03 Detroit, Plymouth Carlton Bog inlet
03 Detroit East Br. Sebasticook River
03 Frankfort, Winterport Marsh Stream
03 Pittsfield Sebasticook River
06 Searsmont Bartlett Stream
06 Somerville Sheepscott River
09 Benton Sebasticook River
10A Winslow Sebasticook River
14 Leeds Dead River
15 Chelsea, Farmingdale Kennebec River
15 Gardiner, Litchfield Cobbosseecontee Stream
15 Greene Hooper Brook
15A West Gardiner Cobbosseecontee Stream
16 Bowdoinham, Woolwich Kennebec River
16 Kennebunk Mousam River
17 Auburn, Lewiston Androscoggin River
24 Biddeford, Saco Saco River
34A Benton, Fairfield Kennebec River
34A Oakland Messalonskee Stream
34A Waterville Messalonskee Stream
35 Jefferson, Windsor Sheepscott River
35 Warren Saint George River
35B Augusta Lower Togus Pond
39 Dixfield, Peru Androscoggin River
40A Bucksport, Prospect Penobscot River

2) No overstory removal at specific Bald Eagle nests or foraging perches in close proximity to an existing right-of-way at these sites:

ROW segment	Township(s)	BAEA Nest #	Habitat Concern
01	Orrington	319B	diurnal perches
01	Winterport	325B	diurnal perches
16	Bowdoinham	009E, 009F	core nest buffer + diurnal perches
34A	Benton	278A, 278B	core nest buffer + diurnal perches

1. There are no timing constraints for site preparation or line construction activities completed before March 1, 2010. Activities conducted during the period March 1 – August 31, 2010 could pose disturbances to nesting Bald Eagles within 0.4 kilometers (= ¼ mile radius). Bald Eagle nests documented in 2009 along the MPRP corridor could relocate in 2010 or subsequent years. A resurvey during of neighboring nests during April, 2010 is advised to evaluate potential changes in nest location and / or status of active breeding when site preparation or line construction are scheduled during March 1 – August 31 at the following locations:

ROW segment	Township(s)	BAEA Nest #	(~ROW distance)	Survey Site
01	Orrington	319A	(1.4 km)	Brewer Lake
01	Orrington	319B	(0.5 km)	Fields Pond
01	Winterport	325A	(1.4 km)	Penobscot River
01	Winterport	614A	(1.6 km)	Marsh Stream
02	Bucksport	500A	(0.7 km)	Penobscot River
03	Frankfort	614A	(1.3 km)	Marsh Stream
09	Palmyra	513A	(1.6 km)	Douglas Pond
10A	Winslow	251A	(0.4 km)	Pattee Pond Brook

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10A Winslow 251D (0.5 km) Pattee Pond Brook
10A Winslow 555A (0.7 km) Kennebec River
14 Livermore 356A (1.0 km) Androscoggin River
15 Auburn 408B (0.3 km) Androscoggin River
15 Greene 407B (0.7 km) Sabattus Pond
15 Greene 407C (0.4 km) Sabattus Pond
15 Livermore Falls 537A (0.4 km) Androscoggin River
15A West Gardiner 003C (1.2 km) Cobbosseecontee L.
16 Bowdoinham 009E (0.2 km) Kennebec River
16 Bowdoinham 009F (0.2 km) Kennebec River
17 Durham 562B (0.5 km) Androscoggin River
17 Lewiston 562A (0.0 km) Androscoggin River
29 Wiscasset 563A (1.3 km) Back River
29 Wiscasset 431A (0.4 km) Sheepscott River
34A Benton 278A (0.1 km) Kennebec River
34A Benton 278B (0.1 km) Kennebec River
34A Benton 278C (1.0 km) Kennebec River
35 Waldoboro 403A (0.7 km) Medomak Pond
39 Mexico 586A (1.1 km) Androscoggin River

---- Original Message ----

From: Hallowell, Dawn

To: Stadler, Mark

Sent: Wed Dec 30 14:27:04 2009

Subject: RE: CMP MPRP IWWHs and aviation bird balls

Hi Mark,

I hate to burden you but I never got a response to this inquiry. If it's not possible to id these areas ahead of time I'll leave the language as is… that CMP needs to consult with IF&W when crossing IWWH's. Just let me know.

Thanks,

Dawn Hallowell

Maine DEP

312 Canco Rd

Portland ME 04103

Phone: 207-822-6324

Fax: 207-822-6303

Email: Dawn.Hallowell@maine.gov

From: Stadler, Mark

Sent: Friday, December 04, 2009 4:04 PM

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To: Timpano, Steve

Cc: Pratte, John; Lindsay, Scott; Camuso, Judy; Connolly, James; Kemper, Keel; Dressler, Richard; Allen, Brad; Hallowell, Dawn

Subject: CMP MPRP IWWHs and aviation bird balls

Steve,

Dawn Hallowell called me yesterday to ask if MDIFW could identify in advance those CMP MPRP IWWHs where MDIFW will be requiring aviation marker balls.

Apparently CMP is requesting that these be identified in advance.

Since I'll be away on vacation from 12/7 -12/15, please review w/ Pratte / Dressler and determine if this can be accomplished and when. Then advise Dawn.

Thank you!

--mark

G. Mark Stadler, Director

Wildlife Division

Maine Dept. of Inland Fisheries & Wildlife

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