

Eversource X178 Decommissioned Pole Removal Phase II Report

Easton, Lincoln, & Woodstock, NH



Prepared For:
Eversource Energy
13 Legends Drive
Hooksett, NH 03106

January 2016

Prepared By:
Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110
www.normandeau.com

 **NORMANDEAU
ASSOCIATES**
Environmental Consultants

Table of Contents

	Page
1.0 INTRODUCTION	3
2.0 PHASE II METHODS	3
3.0 PHASE II RESULTS	4
4.0 SUMMARY	5

Attachments

- Attachment A - Eversource X178 Pole Removal Summary Table
- Attachment B - Phase II Field Monitoring Memos & Photographs

1.0 Introduction

Normandeau Associates, Inc. (Normandeau) was retained by Public Service Company of New Hampshire dba Eversource Energy to assist with an assessment and management plan for decommissioned poles in the Eversource X178 transmission line right-of-way (ROW) within the White Mountain National Forest (WMNF) in the towns of Easton, Lincoln, and Woodstock, NH. This transmission line passes through remote and rugged terrain, including two steep cliffs, streams, and large expanses of Wetlands including Bog Pond. Eversource proposed to remove the decommissioned poles that could be extracted without substantial impacts to natural resources, following a two- phased approach. Phase I was a field survey and development of a pole management plan, which was completed in 2014.

Phase II was the implementation of the WMNF-approved management plan, including removal of the accessible poles, which was performed between October 27 and November 11, 2015. Normandeau was present during each of the field dates to observe the removal, and provide guidance to PAR Electrical Contractors, Inc. (PAR) concerning environmental impacts. Eversource retained PAR to remove the decommissioned transmission poles, hardware pieces, and any additional materials that had been left within or on edge of the right of way. Only poles that could be accessed without significant impacts to wetlands were removed.

2.0 Phase II Methods

A Normandeau Certified Wetland Scientist was present with the PAR team each day PAR was on site. We accompanied the PAR employees and provided advice as to which poles to remove and which poles should remain, based upon environmental impact that would result from removal. We walked the length of the ROW, with PAR removing the poles along the way, using the following general procedures:

- Poles that were sound were cut into manageable sizes based upon weight, and airlifted out to a landing zone. These were then hauled off by a disposal company for disposal.
- Poles that were rotted were cut into pieces and placed into “bagster”s and airlifted out. The bags were emptied into dumpsters for disposal.
- Hardware found on the ground was placed in the bagsters with the pole pieces and airlifted out. Once at the landing zone, all hardware, wire and metal pieces were separated out. Hardware attached to poles and cross arms was also removed for separate disposal.

- Poles that were under the power lines or in the woods were pulled to a clear area for airlifting from the ROW.
- Poles that were sitting on top of wetland areas were cut and removed if sound. Poles and cross arms that were buried in wetlands, were left in place if removal would require substrate disturbance or result in sedimentation.
- Poles that were found to be at risk of impacting sensitive environments were left in place if removal would impact the resource
- Poles currently serving as snowmobile bridges were left in place.

3.0 Phase II Results

The decommissioned poles varied in condition from firm to rotten, with the majority of the poles being sufficiently firm to be airlifted, once they were cut into light enough pieces to be managed by the helicopter. Approximately one quarter of the poles and cross-arms were found to be sufficiently rotten to require placement in bagsters. The contractors were able to remove the decommissioned structures with their helicopter, whether the poles were under the power lines, or at the edge of the woods, as men on the ground (sometimes with helicopter assistance) pulled each of the poles to a cleared space to be removed. No temporary matting of wetlands was needed as no on-ground equipment was used. No wetland impacts were noted during the operation. Poles that were submerged in and surrounded by large wetlands, or were otherwise impractical to access without causing wetland impact, were identified as requiring significant wetland and environmental impact and left in place. This included all poles submerged in wetlands, including poles embedded in Bog Pond. Poles in upland areas surrounded by Bog Pond were removed, as the contractor flew the crew into the isolated spots, and after cutting the poles, removed the poles and the crew by helicopter.

During Phase I, ten poles were initially targeted for removal with ground equipment, as no wetlands would need to be crossed (5 each in Woodstock and Easton). Due to the nature of PAR's Phase II operation, however, these were removed by helicopter, as it was the most convenient way to accomplish removal.

Wetland impacts were minimized by use of the helicopter. Ground vehicles and local trails were not utilized so wetland crossings with equipment were not necessary. The crews were flown in and out at the end of each day. On a couple of windy and rainy days, the crew was not able to work (or had shortened days) because the helicopter could not fly safely. On one day, work was done at low elevation due to inclement weather at higher elevation.

4.0 Summary

The attached Phase II pole removal summary table (Attachment A) identifies the number and condition of poles removed by location and the poles that were left behind and reasons for leaving them in place. We initially estimated there were 211 decommissioned poles within the ROW corridor. During the time we were on site, with PAR and Normandeau working to remove poles, we counted 178.5 poles that were removed, and 51 that were left in place to avoid environmental impact. This yielded a revised total of 223.5 poles. Our counts varied somewhat from the initial Phase I review due to additional poles found during Phase II, and some shorter poles which were added together to equal one pole. Additionally, cross arms were included in the pole count. Two cross-arms were considered equivalent to one pole.

Removal took a total of 11 days of effort over the course of 3 weeks. The field monitoring reports with photographs are included in Attachment B. Subsequent to the decommissioned pole removal operation, the landing zones were demobilized and restored to pre-construction conditions.

Attachment A

Phase II Pole Removal Summary Table

Nearest X178 Pole	Town	# Poles	Rotten	In-between	Firm	Initial Normandeau Inspection	Not Removed	PAR removed	Removal Comments
266	Easton	1		1		7 short 7' poles		2.5 equivalent	8 pole pieces @ 8' each, plus cross arm pieces & hardware
267	Easton	2		1	1	1 firm, 1 in between, cross arm, insulator		3.5 equivalent	1 @ top of cliff, 2 @ base of cliff, rotted cross arm @ top
268	Easton	3	1	1	1	1 firm, 1 rotten, 1 in-between		3.5 equivalent	tough access, 1 base of slope, 1 in woods next to brook fallen tree on top
269	Easton	1	1			rotten - 6'		2.5 equivalent	tough access, wetland crossing to helipad
270	Easton	1	1			rotten - 6'		2.5	2 poles plus 20' section
271	Easton	0						0.5	6 ea 4' poles found in the woods
272	Easton	1			1	firm - 12', and pole stub		0.5	1@12', 1@ 2'4
273	Easton	1		1		in 5 pieces, 5-12'	2' piece left	1	pieces on top of wetland
279	Easton	11			11	Mostly Used as a bridge	7 for bridge	4	10 pieces@ 15', 1@5', coil of wire
283	Easton	0.5	0.5			rotten - 15', and cross arm		.5 equivalent	rotted cross arm plus brackets
288	Easton	4	1	2	1	6' poles, firm to rotten		1	5 ea @ 10'
291	Easton	1		1		in several 8' pieces		1	3@5', 1@15' no impact to archaeological resources
		26.5	4.5	7	15		7	23	

Nearest X178 Pole	Town	# Poles	Rotten	In-between	Firm	Initial Normandeau Inspection	Not Removed	PAR Removed	Removal Comments
211	Lincoln	1	1			rotten, plus cross arm		4.5	4 poles plus cross arm. 3 poles found in the woods
212	Lincoln	1			1	firm, plus 2 short pieces		2	5 @6', 3@15'
213	Lincoln	3			3	firm, 6 pieces total 25-40'		4	2@40', 2@20', 2@ 10-15'
214	Lincoln	4	2	2		rotten to in-between, pieces	2@15'	4	4@40'
215	Lincoln	4	4			full rotten plus shorter pieces		4	3@55', 1@25'
216	Lincoln	0				No poles noted		3.5 equivalent	4@15' pole pieces, plus 2-6' arm pieces
217	Lincoln	3		3		in-between		3	3 poles at 45' with fallen maple tree on top
218	Lincoln	5	1	3	1	rotten to firm	1@30'	2.5	4@20', 1@10'
219	Lincoln	2		1	1	firm & in-between, diff. lengths		2.5	2 poles plus cross arm
220	Lincoln	6	4	2		cross arm, 1 pole broken		3.5 equivalent	3 poles @50' plus cross arm
221	Lincoln	0				No poles noted		2.5 equivalent	2 poles, plus cross arm
222	Lincoln	2			2	1 full, one 30' plus short pieces		2.5 equivalent	2 poles, 1@4', cross arm plus hardware
223	Lincoln	5	2		3	one pole 15'; also cross arm		3.5	3 poles plus 1@15'
224	Lincoln	4	1	3		1 rotted full, 3 -8' pieces	10' of cross arm	4.5	4 poles above ground in wetland
225	Lincoln	4		2	2	firm to in-between		4.5	4 poles, ½ cross arm, plus hardware
226	Lincoln	2		2		in-between		3	3 poles
227	Lincoln	2		2		in-between	2 poles	1.5 equivalent	1 pole plus cross arm
228	Lincoln	4		4		in-between		5.5	5@40', 2@10'
229	Lincoln	4	1	2	1	plus 10' rotted pole piece		3.5 equivalent	3@40', 1@5', part of cross arm
230	Lincoln	3			3	firm	1@40', 2@10-15'	2	2@45'
231	Lincoln	2			2	firm 30' poles		2.5	2@40', 2@5'
232	Lincoln	1		1		30' pole, and 2 rotten 6' pole pieces		1.5 equivalent	1 pole plus pieces
233	Lincoln	3	1		2	2 firm full poles, rotted 10' pole, cross arm		2.5	2 poles plus 1-10' piece
234	Lincoln	2			2	full 5' firm pole pieces		2	2 full pole, pieces, plus 4' cross arm piece
235	Lincoln	13		13		in-between, mostly full length		12	6@40', 1@25', cross arm
236	Lincoln	5		3	2	firm and in-between, and 4' pole piece		2	2 poles in pieces
237	Lincoln	1	1			rotten 12'		0.5	20' pole removed
241	Lincoln	0						0.5 equivalent	10' of cross arm removed
242	Lincoln	2			2	firm	1 pole	2.5 equivalent	2 poles plus cross arm removed, 1 pole left in wetland
243	Lincoln	5		5		in-between, 2 of the 5 are in pieces		2.5 equivalent	2 poles plus cross arm
244	Lincoln	4			4	firm poles plus cross arm	3' pole piece	4	4 poles removed
245	Lincoln	3	2		1	firm & rotten 4' - 6'		1	2 pieces
246	Lincoln	3	1		2	rotten 50', firm 20'&30'	1.5 poles	2	2 poles removed,
247	Lincoln	2			2	firm 15' poles, and 3' piece		2	2 poles, cross arm piece, hardware
248	Lincoln	1			1	1 full & firm, 1 in 3-15' pieces		2	2 poles
249	Lincoln	2			2	firm		3	2 poles, 2 cross arms from upland island
250	Lincoln	2		1	1	firm and slightly rotten, and cross arm	2 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
251	Lincoln	4			4	firm	4 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
252	Lincoln	4			4	firm	4 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
253	Lincoln	2			2	firm	2 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
254	Lincoln	2			2	firm poles and 2 5' pieces	1 pole & 2 pieces@5'	1	1 pole lying on top of another was removed. OTHER LEFT TO REDUCE IM
255	Lincoln	2		2		2 full, in-between	2 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
256	Lincoln	4		3	1	2 full, 1 30', 2x10', in-between, cross arm	4 equivalents	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
257	Lincoln	2			2	firm - full length		3.5 equivalent	3 poles, 1 piece, 30' cross arm
258	Lincoln	4			4	4 - 10' sections, cross arm, wire, hardware		4.5 equivalent	4 rotted poles, cross arm, wire & hardware
260	Lincoln	0				a few small pieces and wire		0	near AT crossing, wetland cross to helipad
261	Lincoln	0				a few small pieces		.5 equivalent	2@2', cross arm, guy wire
262	Lincoln	1	1			rotten - 30'		3.5 equivalent	3@40', plus cross arm
264	Lincoln	8		3	5	and several short 3' pole pieces in wetland	3' pole piece	5	5 poles removed, 3 poles left behind in wetland
		143	22	57	64			28	127

Nearest X178 Pole	Town	# Poles	Rotten	In-between	Firm	Initial Normandeau Inspection	Not Removed	PAR Removed	Removal Comments
199	Woodstock	3	1	2		3' pieces, 8' & 15';		2	rotted pole sections cut and flown out in 1 bagster
200	Woodstock	2	1		1	1 full firm, 1 rotten in parts		2 poles	2 poles flown out in 2 bagsters
202	Woodstock	2	1		1	firm to rotten, full and broken		2 pole equivalent	1.5 poles plus 30' cross arm
202	Woodstock	16			16	30' poles for stream crossing	16 ea (bridge)	0	2 poles plus 30' cross arm, rest left in place
203	Woodstock	2		1	1	in several pieces		1.5 equivalent	1 ea @20', 2ea 30' cross arms
204	Woodstock	2			2	firm		2	2 poles @40'
205	Woodstock	4			4	firm 25-30'		2	4 sections @ 20'
206	Woodstock	0						2	5 pieces @ 15' ea
207	Woodstock	4		4		in between		7	4 original poles, plus 3 additional poles removed
208	Woodstock	1	1			rotten		1	40' pole
209	Woodstock	4	1	2	1	cross arm and hardware		5 equivalent	4 ea @40' poles plus 2 30' cross arms
210	Woodstock	1	1			rotten, plus 3 short pieces		2	1 @ 50' pole, plus 5 pieces @ 6'
		41	6	9	26		16	28.5	

Attachment B

Phase II Field Monitoring Memos and Photographs

Memorandum

To: Lee Carbonneau

From: Dan Coons

Date: 11/9/2015

Re: X178 Decommissioned Pole Removal Monitoring – Lincoln, Woodstock and Easton, NH

Date of Monitoring:	November 2,3,4,&6 2015
Normandeau Field Monitor:	Daniel Coons
Project Name:	X178
Project No.:	22240.04
Contractor:	PAR Aviation - WINCO
Time of Arrival:	07:45:00 AM
Time of Departure:	4:00:00 PM 11/2, 5:00 PM 11/3, 4:40 PM on 11/4, 3:10pm on 11/6
Weather:	Rain and low clouds on 11/6, otherwise variable cloudiness
Others Present:	YT Leblanc - Eversource

Current Construction Activities

PAR resumed activity this week to remove the decommissioned poles from upland areas along the Right of Way corridor between the Easton/Lincoln town line and Route 112 in Woodstock. Some poles and parts of poles were removed from wetlands areas where they were resting on top of the ground and we determined that the poles could be removed without adverse environmental impacts. Work was completed from Structure 264 at the Lincoln/Easton town line and continued to Structure 223 in Lincoln until bad weather early Friday afternoon caused cessation of the activity for the week.

We were advised on 11/6 that work would be permitted within the town of Easton, so those activities will be completed next week if the weather cooperates.

Observations/Issues/Resolution

November 2, 2015 - PAR commenced work to remove decommissioned structures today starting at Structure 243 and proceeding northwest towards the bog. Once the crew reached structure 247 at the edge of Harvard Brook, all members flew across the brook to work on the two structures located on upland islands north of the brook. Poles and cross arms were removed from structures 243, 244, 245, 246, 247, 248, and 249. The contractor removed solid poles by a sling, transporting said poles by helicopter to the landing zone in North Woodstock. Less than sound poles were cut and placed into "bagster" bags which were also airlifted by helicopter to the landing zone where all of the removed

poles and pieces were placed into 30 yard dumpsters to be removed from the site when full. We have attached representative photos of the operation.

We counted approximately 20 poles removed along with 4 cross arms and various pieces of hardware. One half pole was left in the wetland near structure 246, one pole left in the wetland at #247

November 3, 2015 – Activity today commenced just south of the Easton town line at Structure 264 and continued to Structure 257. Poles were not removed from Structures 251 – 256 as they were submerged in the peat of the bog, and we felt that removal would cause unacceptable adverse wetland impacts. Additionally, we felt it would be best to leave 3 poles within the wetland near Structure 264 because of adverse wetland impacts.

We have estimated that 17 poles, 3 cross arms, several pole pieces, and a variety of metal hardware were removed to day.

November 4, 2015 – Work returned to Structure 234 today, and progressed to Structure 226. A total of 19 poles were removed today, plus 2 cross arms and a number of partial pole sections. One pole and 2 pieces were left in the wetland near Structure 230, part of a cross arm was left at #229, and 2 poles were left between #227 and 228.

November 5, 2015 – No work was done on pole removal today, as the contractor was attending training in Massachusetts.

November 6, 2015 - Operations resumed today at 8:00 am. After starting at Structure 226, and proceeding to #223, the contractor had to leave the site due to low cloud cover in the work area which created unsafe flying conditions. Work resumed at 1:15 pm, but ceased at 3:00 pm due to arrival of rain, and another band of low clouds which again created un-safe working conditions.

Approximately 16 poles, and most of 3 cross arms were removed today. Part of 1 cross arm was left at #224 due to adverse wetland impacts that would likely be caused if it were removed.

FUTURE ACTIVITY

Work is scheduled to resume on Monday, November 9, 2015.

Photos: following pages



STR 243 cross arms awaiting removal – 11/2/15



Pole piece not removed – 11/2



#246 pole not removed from wetland – 11/3



#264 pre removal – 11/3



Area at #264 post removal



Poles left in wetland near structure 264 to avoid wetland impacts – 11/3



Poles at 227.5 – not removed 11/4



Pole near Structure 230 not removed so as to not adversely impact wetland – 11/4



#223 pre-removal



#223 post removal



#224 cross arm not removed to reduce wetland impacts

**X178 Decommissioned Pole Removal – Lincoln,
NH**

FIELD MONITORING MEMO

Date of Monitoring:	November 9,10,&11 2015
Normandeau Field Monitor:	Daniel Coons
Project Name:	X178
Project No.:	22240.04
Contractor:	PAR Aviation - WINCO
Time of Arrival:	07:45:00 AM 11/9, 07:00 11/10 & 11/11
Time of Departure:	4:30 PM 11/9, 5:00 PM 11/10, 12:45 PM on 11/11
Weather:	Sunny on 11/9 & 11/10, Rainy and overcast on 11/11
Others Present:	YT Leblanc - Eversource

Summary of Construction Activities

PAR finished activity this week removing the decommissioned poles from upland areas along the Right of Way corridor between Rt 112 in Woodstock and Route 116 in Easton. All poles and parts of poles, cross-arms and hardware that could be removed without adverse impact to wetlands were removed from the Right of Way corridor where they had been left during previous structure maintenance. Work has now been completed from Structure 192 near Route 112 in Woodstock to Structure 296 near Route 116 in Easton.

Normandeau was present during operating hours to guide the contractor in removing previously downed poles, pieces, cross-arms, and hardware, without impacting wetlands. All removal work was conducted by a crew of 3-5 men, plus a helicopter and pilot. Poles, pieces and cross-arms were airlifted out via sling when they were sound enough to do so. When not sound, or the pieces were too small, they were cut up, and placed into “bagsters” which were airlifted out by helicopter. Rotted wood pieces were all removed when they were more sound than “sawdust and toothpicks”. Furthermore, PAR was able to remove poles from beneath the power lines, by manually pulling them from beneath the lines before attaching them to the helicopter. In many instances, the decommissioned poles had been previously placed along the edge of the woods, and saplings had grown up between the poles and the cleared right of way.

Normandeau was satisfied with the efforts of PAR in the removal of the poles. They were diligent and removed many rotted poles that had deteriorated into pieces. Additionally, they were responsive to leaving behind poles which were buried within wetlands.

Observations/Issues/Resolution

November 9, 2015 - PAR commenced work to remove decommissioned poles today starting at Structure 223 and proceeding southeast towards the Woodstock town line. Work continued all day, and ended at Structure 213. Poles and cross-arms were removed from structures 223, 222, 221, 220, 219, 218, 217, 216, 215, 214 and 213. The contractor removed solid poles by a sling, transporting said poles by helicopter to the landing zone in North Woodstock. Less than sound poles, cross-arms and hardware were cut and placed into “bagster” bags which were also airlifted by helicopter to the landing zone where all of the removed poles and pieces were placed into 30 cubic yard dumpsters to be removed from the site when full. Representative photos of the operation are attached. A large tree had fallen atop the stockpiled poles at 217 and had to be removed so as to gain access to the poles.

We counted approximately 30 poles removed along with 4 cross-arms and various pieces of hardware. One pole was left in the wetland at #218, and two pieces were left in the wetland at #214, as removal would have resulted in adverse wetland impacts.

November 10, 2015 – Activity today commenced just south of the Easton town line at Structure 212 in Lincoln and continued to Structure 210 in Woodstock. This work completed the removal of all poles and debris south and east of Bog Pond. PARs worksite was moved to the alternate landing zone in Easton, and the crew flew to the sand pile near Structure 265 in Easton, and commenced work towards the northwest, continuing to Structure 271 by the end of the day.

Work on the upper Easton stretch was complicated by tough work conditions. The downed poles at #267 were located both at the top of and at the base of a cliff, with poles buried in the brush. Please note the attached photos. The poles at #268 were located over the side of a bank, perhaps 30 or more vertical feet below the structure. The poles at #270 were located along the slope of and at the base of a ravine, and were also partly covered with brush.

In spite of difficulty encountered with the topography today, and logistics of moving to the secondary landing zone, the contractor was still able to remove approximately 20 poles, and several cross-arms. We have estimated that 17 poles, 3 cross-arms, several pole pieces, and a variety of metal hardware were removed today.

During operations today, we encountered a local citizen who climbed to structure 270 to check the work being performed. Although I identified myself, she did not identify herself, so we are unclear of her identity. I advised her that I was monitoring the activity of the contractor to make sure that their operations did not do environmental harm. She then wished to get closer to the removal operations, and I warned her not to get too close, as it could be dangerous. She moved downslope of the pole removal, took some additional photos, and then left after approximately 10 minutes.

November 11, 2015 – The crew returned to Structure 272 and continued northward towards Route 116 in Easton. After completing the removal of downed poles in the stretch from #272 to #291, and after the clouds cleared sufficiently, we flew the line to check for any downed poles that might have been missed during the walk down. We located a 15' piece near #245, and a full pole in the bog near #254. The top of the pole at 254 was buried within the bog, and left in place to prevent wetlands impact. The rest of this pole was resting atop another pole, so it was not causing wetland impacts, and was removed. A crew of 2 flew into both locations, and removed these two downed poles, and they were flown to primary landing zone, completing the removal.



Pole left in wetland near #218



Poles at #214 prior to removal



Poles at 214 following removal



267 base of cliff



Near 268 - base of slope



Near #270 base of ravine



Near #273, poles on surface, removed from wetland



#273 – pole piece buried in wetland, not removed