SEACOAST RELIABILITY PROJECT
EXISTING CABLE REMOVAL PLAN

OVERVIEW

In support of the submarine cable installation proposed for the Seacoast Reliability Project, Eversource Energy has prepared this Existing Cable Removal Plan which documents and assesses the existing historic submarine cables in the cable route crossing in Little Bay and describes the procedure for removal of existing cable within the path of the proposed new 115 kV submarine cables.

CABLE HISTORY AND IDENTIFICATION

To confirm the identification of existing submarine cable types and their components, samples of the cables were recovered by Eversource's cable installation contractors, LS Cable and Durocher Marine (LS/Durocher), on March 25 and 26, 2017. A total of 13 individual cable samples (5 on the east shore and 8 on the west shore) were recovered. Photographs of the recovered cable samples are provided in **Appendix A**. Recovered samples were sent to Cable Technology Laboratories (CTL) in New Brunswick, NJ to identify the approximate age, and component composition of the various cables. CTL's preliminary cable investigation report is provided in **Appendix B**.

CTL's investigation of the cables revealed among the 13 samples that four general cable types were observed. Cable construction and approximate installation dates are listed below

- 1902-1920's Rubber insulated, 3-core, 6 AWG, concentric stranded copper conductor, jute fillers (cables samples East 4, East 5, West 4 and West 5). According to Public Service of New Hampshire records (PSNH) these were the initial three cables installed across Little Bay and were operated at a voltage of 13.8 kV.

- 1920's Varnished cambric tape insulated, 3-core, 4 AWG concentric stranded copper conductor, lead sheath, jute fillers and (cable samples East 2, East 3, West 6 and West 7). These cables are presumed to be replacements or splices to the early 1900's rubber insulated cables and are presumed to also have been operated at a voltage of 13.8 kV.

- 1940's Oil impregnated cellulose paper insulated, 3-core, 4 AWG, concentric stranded sector copper conductor, copper shield, lead sheath, jute filler (cable samples East 1 and West 8). PSNH records indicated that this single 3-core cable was installed in 1948 as a replacement to the original cables (which were left in place) and was operated at a voltage of 34.5kV. A fault in this cable was discovered in 1995 near the east shore of Little Bay and the cable was taken out of service. Attempts to remove the cable 1996 from the shore using a winch were unsuccessful.

- 1970's Oil impregnated cellulose paper, single core, 4 AWG, concentric stranded copper conductor, lead sheath, polyethylene jacket (cable samples West 1, West 2 and West 3). According to PSNH records, three of these single core cables were spliced with the 1940s 3-core cable in the near shore area on the west side of Little Bay in the 1970s.

The CTL report observed that most of the cable samples had outer stranded jute cushioning layers. No steel armor wires were present on any of the cable samples. PSNH records indicate that the 1940's cable was constructed with steel armor wire.

LABORATORY ANALYSIS

For disposal characterization purposes representative cross sections of the different cable types were processed and analyzed at Eastern Analytical Laboratory in Concord, NH for the following constituents:

- Polychlorinated biphenyls (PCBs) via EPA Method 8082A
- TCLP Lead via EPA Method 6020
- Asbestos via PLM/DS EPA Methods EPA-600/M4-82-020, EPA-600/R-93-116

The Eastern Analytical Laboratory Report is provided in **Appendix C**. PCBs and asbestos were not detected in any of the cable samples. TCLP lead concentrations ranging between 18 and 2400 mg/L were detected among the samples. The results of TCLP leachate tests are intended solely for purposes of determining appropriate disposal options and does not have relevance to predicting environmental concentrations.

Eversource reviewed sediment data collected from the two proposed cable clearance areas (Clearance Area 1 and Clearance Area 2). The sediment data was generated in December 2016 and May 2017 during the sediment investigation performed by Normandeau Associates Inc. Based on the sediment testing results, total lead concentrations in the shallow sediments in each of the Clearance Areas was less than Effect Range Low (ER-L) concentrations indicating that the presence of the cables is not exacerbating contaminant conditions. Sediment testing results for lead from the samples collected from the Clearance Areas are in Table 1. A figure showing the sediment sample locations relative the Clearance Areas is shown on Figure 1. Clearance Area 1 and Clearance Area 2 are shown in LS/Durocher's Cable Removal Plan provided in **Appendix D.**

CABLE REMOVAL

In order to facilitate installation of the new proposed 115 kV submarine cable, Eversource proposes to remove two sections of cable that are within the new cable route alignment. The sections of cable will be removed in bulk in accordance with industry accepted practices. The cable removal process and the approximate locations of existing cables described in LS/Durocher's Cable Removal Plan provided in **Appendix D**. The locations of existing cables are based on a survey conducted by Ocean Survey Inc. in 2013. While OSI's survey identified the geospatial presence of the existing cables, there is some uncertainty as to the cable type at each location. Based on diver reconnaissance, the southern most cable, which requires portions to be removed, is believed to be the 1940's cable.

Table 1. Laboratory Testing Results - Sediment
Summary of Lead Testing Results
Eversource NH Seacoast Reliability Project
Newington, New Hampshire

						Sample Location	Clearance Area 1				C4	
						Sample ID	C1	C2	C2-A	C-3	C4	C4-A
						Sample Depth (inches)	0-48	0-48	0-24	0-48	0-48	0-24
Analyte	**Method**	**Units**	**ER-L**	**ER-M**	**NCCA Range**							
Total Metals	**6010C**	mg/kg										
Lead			46.7	218	22.2 - 43.4		11.7	7.49	10.7	8.36	5.13	5.36

						Sample Location	Clearance Area 2				
						Sample ID	C5	C6	C7	C7-A	C8
						Sample Depth (inches)	0-48	0-48	0-48	0-24	0-48
Analyte	**Method**	**Units**	**ER-L**	**ER-M**	**Range**						
Total Metals	**6010C**	mg/kg									
Lead			46.7	218	22.2 - 43.4		4.8	6.03	4.07	5.22	4.4

						Sample Location	C9		C10	C11		C12	
						Sample ID	C9	C9-A	C10	C11	C11-A	C12	C12-A
						Sample Depth (inches)	0-48	0-18	0-48	0-48	0-24	0-48	0-24
Analyte	**Method**	**Units**	**ER-L**	**ER-M**	**Range**								
Total Metals	**6010C**	mg/kg											
Lead			46.7	218	22.2 - 43.4		5.39	11.4	2.88	9.39	16 9	4 6	3.58

General Notes

1. For a complete list of analytes see the laboratory data sheets.
2. ER-L = Effects Range Low = 10th percentile on an ordered list of concentrations in sediment found in the literature that co-occur with any biological effect; concentrations lower than the ER-L value represent a minimal-effects range in which effects would be rarely observed.
3. ER-M = Effects Range Median = 50th percentile; concentrations equal to and above the ER-L, but below the ER-M represent a possible-effects range.
4. mg/kg = milligrams per kilogram.

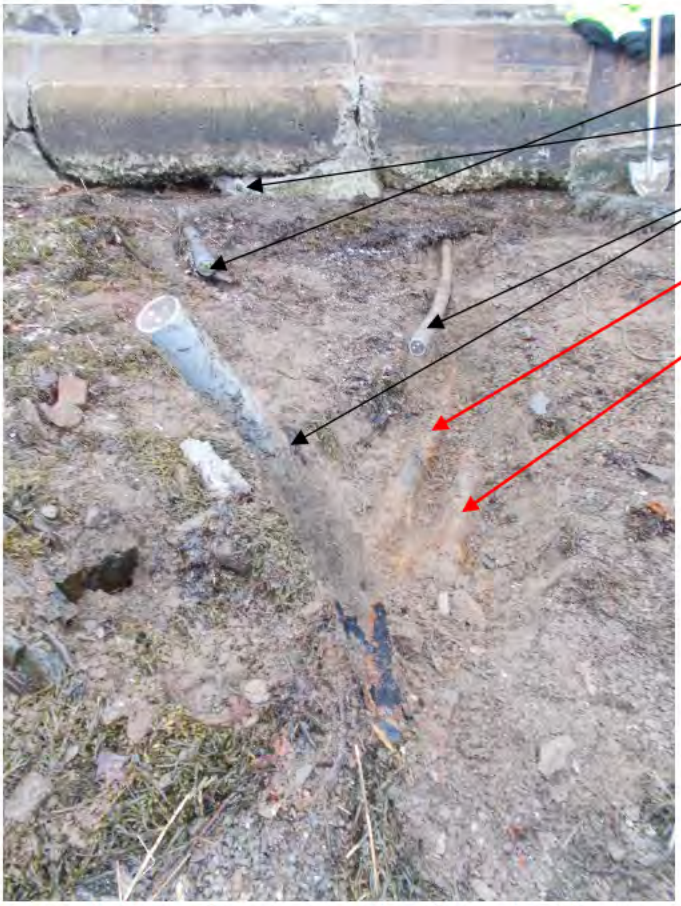

C1
Clearance Area-1
C2
C3
C4
C5
C6
C7
Clearance Area-2
C8a
C8
C9
C10
C11
C12

LIST OF APPENDICES

APPENDIX A

LS Cable/Durocher Existing Cable Sample Recovery Photos
3/25/2017 –Newington East Shore Cables
3/26/2017 – Durham West Shore Cables

Figure 1: Photo from 03/21/17, three (3) cables visible.



Cable #1

Cable #2

Cable #3- spiked and cut 03/24/17

Cable #4- same trench as #3

Cable #5- same trench as #3

Cables #3, #4, and #5 appear to be XLPE Insulated cable with a diameter of 3" +/-

Figure 2: Photo showing two (2) additional cables, #4 and #5. They were buried below cable #3.

Figure 3: Cable #3, three conductor, lead sheath with armor wires completely deteriorated.

Figure 4: Cables #4 and #5 with armor wires still intact.

Figure 5: Cable #4.

Figure 6: Cable #5.

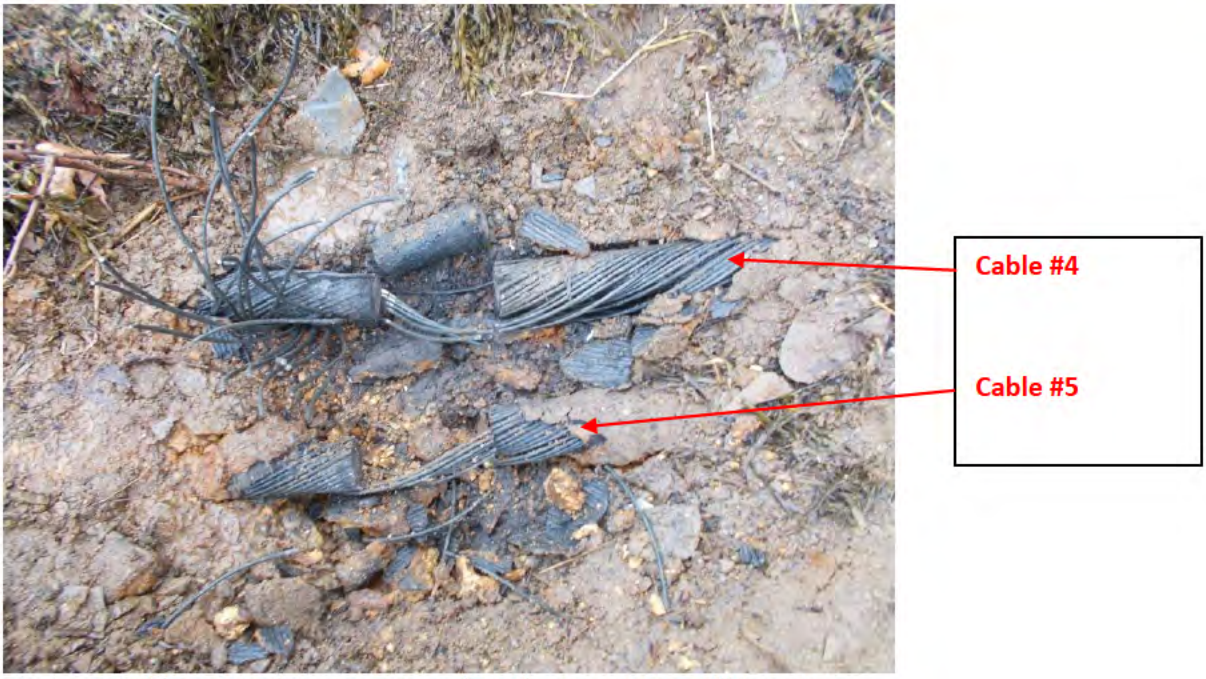


Figure 7: Cables #4 and #5 cut in trench with armor wire still intact.

Figure 8: Cable samples #1, #2, and #3.

Figure 9: Cable samples #4 and #5.

Figure 10: Site prior to cutting second sample from cable #3. Cable #4 and #5 are cut.

Figure 11: Site cleaned up and restored looking east.

Figure 12: Site cleaned up and restored looking north.

Figure 1: Photo (03/21/17) three (3) cables visible in Bay at low tide.

Figure 2: Photo (03/21/17) two (2) additional cables, #4 and #5 at low tide, closer to cable house.

Figure 3: Photo (03/26/17) of cables #6 and #7 at base of cable house.

Figure 4: Photo (03/26/17) zoom-in view of cable #6.

Figure 5: Photo (03/26/17) of eight (8) cable samples taken from west side.

NOTE: CABLE #8 SAMPLE WAS TAKEN FROM A SINGLE 36" +/- PIECE FOUND AT LOW TIDE.

APPENDIX B

Cable Technologies Laboratory – Cable Identification Report

CABLE TECHNOLOGY LABORATORIES

PRELIMINARY REPORT ON

VINTAGE SUBMARINE CABLES SUBMITED FOR

CONSTRUCTION ANALYSIS

CONTENTS

AA

625 Jersey Avenue, Unit 14 – P.O. Box 707
New Brunswick, N.J. 08903

Tel: (732) 846-3133
Fax: (732) 846-5531

PRELIMINARY REPORT ON VINTAGE SUBMARINE CABLES SUBMITED FOR CONSTRUCTION ANALYSIS

1.0 PURPOSE

To provide a preliminary description of vintage submarine cables installed in Little Bay in Durham and Newington, N.H.

2.0 SAMPLES

A total of 13 short sections of submarine cable ranging in length from 2.5 inches to 67 inches were received for analysis.

3.0 DESCRIPTION OF CABLES

Following is a detailed description of each similar design cable starting from the conductor to the outside. It should be noted that even though most of the samples had one or more jute strand cushioning layers at their outside, none of the samples had armor wires in place.

Samples : West 4 – West 5

Insulation: Natural Rubber

Installed: About 1902

Description: 3/C, No. 6 AWG concentric stranded Cu conductor, 0,205 in. rubber insulation, jute fillers, 0.090 to 0.190 in. thick rubber jacket, jute cushioning layer . . . . . .

Samples: East 5

Insulation: Natural Rubber

Installed: about 1902

Description: 3/C, No. 6 AWG concentric stranded Cu conductor, 0.22 in. rubber insulation, fabric tape over each phase, jute fillers, fabric tape binder. 0,070 to 0,170 in. thick rubber jacket, jute cushioning layers, ...

Samples: East 4

Insulation: Natural Rubber

Installed: between 1902 and 1920

Description: 3/C, No. 2 AWG concentric stranded Cu conductor, 0.18 in. rubber insulation, fabric tape protection, jute fillers, cotton yarn binder strips, fabric tape binder, 0.17 to 0.23 in. thick rubber jacket, fabric tape protection, jute cushioning layers . . . .

Samples: East 2, East 3, West 6, West 7

Insulation: Varnished Cambric Tapes – Belted Type

Installed: Most likely in the 1920's

Description: 3/C, No. 4 AWG concentric stranded Cu conductor, 0.21 in. thick wall of varnished cambric tape (each tape about 0.015 in. thick), jute fillers, 0.10 in. thick belt of varnished cambric tape, slipping compound between tapes, about 0.12 in. lead sheath, jute cushioning, layers, ...

Samples: East 1, West 8

Insulation: Oil impregnated cellulose paper

Installed: After 1942, (Eversource records indicate 1948).

Description: 3/C, No. 4/0 AWG, concentric stranded sector Cu conductor, 0.48 in. oil impregnated cellulose paper tapes, Cu tape shield, oil impregnated paper filler, 0.14 in. lead sheath, jute cushioning, ...

Samples: West 1, West 2, West 3

Insulation: Oil impregnated cellulose paper

Installed: 1971 – 1972

Description: 1/C, No. 4/0 AWG, concentric round stranded Cu conductor, 0.44 in. oil impregnated cellulose paper tapes, 0.10 in. lead sheath, 0.09 in. polyethylene jacket, ...

APPENDIX C

Eastern Analytical Laboratory Analytical Report

Eastern Analytical, Inc.

professional laboratory and drilling services

Kurt Nelson
Eversource Energy (Hooksett,NH)
13 Legends Drive
Hooksett , NH 03110

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 169746
Client Identification: SRP Submarine Cables | T1276A
Date Received: 6/9/2017

Dear Mr. Nelson :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.eailabs.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 6-23-17 Date | 10 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **169746**

Client: **Eversource Energy (Hooksett,NH)**

Client Designation: **SRP Submarine Cables | T1276A**

Temperature upon receipt (°C): 25.2 **Received on ice or cold packs (Yes/No): N**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
169746.01	1 EAST	6/9/17	6/8/17	solid	89.0	Adheres to Sample Acceptance Policy
169746.02	2 EAST	6/9/17	6/8/17	solid	98.1	Adheres to Sample Acceptance Policy
169746.03	4 EAST	6/9/17	6/8/17	solid	97.6	Adheres to Sample Acceptance Policy
169746.04	5 EAST	6/9/17	6/8/17	solid	95.6	Adheres to Sample Acceptance Policy
169746.05	2 WEST	6/9/17	6/8/17	solid	98.9	Adheres to Sample Acceptance Policy
169746.06	4 WEST	6/9/17	6/8/17	solid	95.1	Adheres to Sample Acceptance Policy
169746.07	6 WEST	6/9/17	6/8/17	solid	99.0	Adheres to Sample Acceptance Policy
169746.08	8 WEST	6/9/17	6/8/17	solid	87.6	Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater,20th Edition, 1998 and 22nd Edition, 2012
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 2nd edition, 1992

LABORATORY REPORT

EAI ID#: **169746**

Client: **Eversource Energy (Hooksett,NH)**

Client Designation: **SRP Submarine Cables | T1276A**

Sample ID:	1 EAST	2 EAST	4 EAST	5 EAST	2 WEST	4 WEST	6 WEST
Lab Sample ID:	169746.01	169746.02	169746.03	169746.04	169746.05	169746.06	169746.07
Matrix:	solid	solid	solid	solid	solid	solid	solid
Date Sampled:	6/8/17	6/8/17	6/8/17	6/8/17	6/8/17	6/8/17	6/8/17
Date Received:	6/9/17	6/9/17	6/9/17	6/9/17	6/9/17	6/9/17	6/9/17
% Solid:	89	98.1	97.6	95.6	98.9	95.1	99
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Date of Extraction/Prep:	6/12/17	6/12/17	6/12/17	6/12/17	6/12/17	6/12/17	6/12/17
Date of Analysis:	6/13/17	6/13/17	6/13/17	6/13/17	6/13/17	6/13/17	6/13/17
Analyst:	SS	SS	SS	SS	SS	SS	SS
Extraction Method:	3540C	3540C	3540C	3540C	3540C	3540C	3540C
Analysis Method:	8082A	8082A	8082A	8082A	8082A	8082A	8082A
Dilution Factor:	10	10	10	10	9	9	8
PCB-1016	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1221	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1232	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1242	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1248	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1254	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1260	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1262	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
PCB-1268	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
TMX (surr)	**58 %R**	**64 %R**	**79 %R**	**72 %R**	**78 %R**	**82 %R**	**72 %R**
DCB (surr)	**68 %R**	**42 %R**	**58 %R**	**60 %R**	**52 %R**	**61 %R**	**51 %R**

Acid clean-up was performed on the samples and associated batch QC. Detection limits elevated in response to the lower initial mass used for analysis. A lower initial mass was used due to the nature of the sample matrix.

LABORATORY REPORT

EAI ID#: **169746**

Client: **Eversource Energy (Hooksett,NH)**

Client Designation: **SRP Submarine Cables | T1276A**

Sample ID:	8 WEST
Lab Sample ID:	169746.08
Matrix:	solid
Date Sampled:	6/8/17
Date Received:	6/9/17
% Solid:	87.6
Units:	mg/kg
Date of Extraction/Prep:	6/12/17
Date of Analysis:	6/13/17
Analyst:	SS
Extraction Method:	3540C
Analysis Method:	8082A
Dilution Factor:	8

PCB-1016	< 0.1
PCB-1221	< 0.1
PCB-1232	< 0.1
PCB-1242	< 0.1
PCB-1248	< 0.1
PCB-1254	< 0.1
PCB-1260	< 0.1
PCB-1262	< 0.1
PCB-1268	< 0.1
TMX (surr)	**73 %R**
DCB (surr)	**45 %R**

Acid clean-up was performed on the samples and associated batch QC. Detection limits elevated in response to the lower initial mass used for analysis. A lower initial mass was used due to the nature of the sample matrix.

LABORATORY REPORT

EAI ID#: **169746**

Client: **Eversource Energy (Hooksett,NH)**

Client Designation: **SRP Submarine Cables | T1276A**

Sample ID:	1 EAST	2 EAST	4 EAST	5 EAST					
Lab Sample ID:	169746.01	169746.02	169746.03	169746.04					
Matrix:	solid	solid	solid	solid					
Date Sampled:	6/8/17	6/8/17	6/8/17	6/8/17	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	6/9/17	6/9/17	6/9/17	6/9/17					
Lead	**2000**	**1300**	**52**	**18**	TCLPsolid	mg/L	6/15/17	6020	DS

Sample ID:	2 WEST	4 WEST	6 WEST	8 WEST					
Lab Sample ID:	169746.05	169746.06	169746.07	169746.08					
Matrix:	solid	solid	solid	solid					
Date Sampled:	6/8/17	6/8/17	6/8/17	6/8/17	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	6/9/17	6/9/17	6/9/17	6/9/17					
Lead	**2200**	**38**	**2400**	**1900**	TCLPsolid	mg/L	6/15/17	6020	DS

OPTIMUM
Analytical and Consulting, LLC

85 Stiles Road, Suite 201
Salem, NH 03079
603-458-5247

Alison Blay
Eastern Analytical, Inc.
25 Chenell Drive
Concord NH 03301

Project Reference:	169746
Laboratory Batch #:	1721116
Date Samples Received:	06/12/2017
Date Samples Analyzed:	06/22/2017
Date of Final Report:	06/22/2017

SAMPLE IDENTIFICATION:

Eight (8) samples from NH project were submitted by Client on 06/12/2017

This bulk sample(s) was delivered to Optimum Analytical Consulting, LLC (Optimum) located in Salem, New Hampshire for asbestos content determination.

ANALYTICAL METHOD:

Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020, EPA-600/ R-93-116). This report relates only to those samples analyzed, and may not be indicative of other similar appearing materials existing at this, or other sites. Quantification of asbestos content was determined by Calibrated Visual Estimation. Optimum is not responsible for sample collection activities or analytical method limitations. The laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

In any given material, fibers with a small diameter (<0.25μm) may not be detected by the PLM method. Floor tile and other resinously bound material may yield a false negative if the asbestos fibers are too small to be resolved using PLM. Additional analytical methods may be required. Optimum recommends using Transmission Electron Microscopy (TEM) for a more definitive analysis.

Optimum will retain all samples for a minimum of three months. Further analysis or return of samples must be requested within this three month period to guarantee their availability. This report may not be reproduced except in full, without the written approval of Optimum Analytical and Consulting, LLC.

Use of the NVLAP and AIHA Logo in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology or the American Industrial Hygiene Association.

Detection Limit <1%, Reporting Limits: CVES = 1%, 400 Point Count = .25%, 1000 Point Count = 0.1%; Present or Absent are observations made during a qualitative analysis.

This report is considered preliminary until signed by both the Laboratory Analyst and Laboratory Director or Supervisor. If you have any questions regarding this report, please do not hesitate to contact us.

Jamie L. Noel
Laboratory Director

Kristina Scaviola
Laboratory Supervisor

NVLAP Lab ID#: 101433-0

OPTIMUM
Analytical and Consulting, LLC
85 Stiles Road, Suite 201, Salem, NH 03079 Phone: (603)-458-5247

BULK SAMPLE ANALYSIS REPORT
POLARIZED LIGHT MICROSCOPY

PLM (EPA-600/M4-82-020, EPA-600/ R-93-116) NVLAP Lab Code: 101433-0

CLIENT:	Eastern Analytical, Inc.	**ORDER #:**	1721116
ADDRESS:	25 Chenell Drive	**PROJECT #:**	169746
CITY / STATE / ZIP:	Concord NH 03301	**DATE COLLECTED:**	06/08/2017
CONTACT:	Alison Blay	**COLLECTED BY:**	Client
DESCRIPTION:	PLM Analysis	**DATE RECEIVED:**	06/12/2017
LOCATION:	NH	**ANALYSIS DATE:**	06/22/2017
		REPORT DATE:	06/22/2017
		ANALYST:	Jamie Noel

REPORT OF ANALYSIS

Laboratory ID Sample No.	Sample Location Description	Layer No. Layer %	Asbestos Type (%)	Non-Asbestos Components (%)
1721116-001 1 East	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%
1721116-002 2 East	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%
1721116-003 4 East	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%
1721116-004 5 East	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%
1721116-005 2 West	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%
1721116-006 4 West	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%
1721116-007 6 West	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%
1721116-008 8 West	Bulk Material, Brown/Black	LAYER 1 100%	None Detected	Cellulose Fiber 90% Binder/Filler 10%
		Total % Asbestos:	No Asbestos Detected	**Total % Non-Asbestos:** 100.0%

OPTIMUM
Analytical and Consulting, LLC
85 Stiles Road, Suite 201, Salem, NH 03079 Phone: (603)-458-5247

BULK SAMPLE ANALYSIS REPORT
POLARIZED LIGHT MICROSCOPY

PLM (EPA-600/M4-82-020, EPA-600/ R-93-116) NVLAP Lab Code: 101433-0

CLIENT:	Eastern Analytical, Inc.	**ORDER #:**	1721116
ADDRESS:	25 Chenell Drive	**PROJECT #:**	169746
CITY / STATE / ZIP:	Concord NH 03301	**DATE COLLECTED:**	06/08/2017
CONTACT:	Alison Blay	**COLLECTED BY:**	Client
DESCRIPTION:	PLM Analysis	**DATE RECEIVED:**	06/12/2017
LOCATION:	NH	**ANALYSIS DATE:**	06/22/2017
		REPORT DATE:	06/22/2017
		ANALYST:	Jamie Noel

REPORT OF ANALYSIS

Laboratory ID Sample No.	Sample Location Description	Layer No. Layer %	Asbestos Type	(%)	Non-Asbestos Components	(%)

Analyst Signatory:
Jamie Noel

NVLAP®
Lab Code: 101433-0

OPTIMUM
Analytical and Consulting, LLC

85 Stiles Road, Suite 201, Salem, NH 03079 Phone: (603)-458-5247

BULK SAMPLE ANALYSIS REPORT
POLARIZED LIGHT MICROSCOPY

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CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

1721116

EAI ID# 169746 Page 1

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
1 EAST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	
2 EAST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	
4 EAST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	
5 EAST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	

EAI ID# 169746 Project State: NH

Project ID:

Company: Optimum Analytical
Address: 85 Stiles Road, Suite 201
Address: Salem, NH 03079
Account #:
Phone #: (603) 458-5247
Fax Number:

Results Needed by: Preferred date

QC Deliverables
☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ P

Notes about project:
Email pdf of results and invoice to customerservice@eailabs.com.

PO #: 46310 EAI ID# 169746

Please call prior to analyzing, if RUSH surcharges will be applied.

Samples Collected by:

Relinquished by	Date/Time	Received by
[signature]	6/12/17 9:35	[signature]
[signature]	6/12/17 12:10	[signature] 6/12/17 12:10

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301 Phone: (603)228-0525 1-800-287-0525 Fax: (603)228-4591

As a subcontract lab to EAI, you will defend, indemnify and hold Eastern Analytical, Inc., its officers, employees, and agents harmless from and against any and all liability, loss, expense or claims for injury or damages arising out of the performance against this chain of custody but only in proportion to and to the extent such liability, loss, expense, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of you as a subcontract lab, your officers, agents or employees

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BULK SAMPLE ANALYSIS REPORT
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ORDER #:	1721116
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CHAIN-OF-CUSTODY RECORD eastern analytical
professional laboratory services

EAI ID# 169746

1721116

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Sample ID	Date Sampled	Matrix	#Parameters	Sample Notes
2-WEST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	
4-WEST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	
6-WEST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	
8-WEST	6/8/2017	solid	Asbestos PLM Bulk Material Subcontract	

EAI ID# 169746 Project State: NH

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☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ P

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Page ______ of ______

CHAIN-OF-CUSTODY RECORD

For 169746

10

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

Sample I.D.	Sampling Date/Time *If Composite, Indicate Both Start & Finish Date/Time	Matrix (see below)	Grab/*Composite	VOC: 524.2 / 524.2 BTEX / 524.2 MTBE only	VOC: 8260B 624 VTICs / 1, 4 Dioxane	VOC: 8021B BTEX HALOS	VOC: 8015B GRO MAVPH	SVOC: 8270D 625 SVTICs EDB DBCP / ABN A BN PAH	SVOC: TPH8100 L1 L2	SVOC: 8015B DRO MAEPH	SVOC: PEST 608 PCB 608 / PEST 8081A (PCB 8082)	SVOC: Oil & Grease 1664 TPH 1664	TCLP: (TCLP 1311) ABN (Metals) / VOC Pest Herb	Metals: Dissolved Metals (List Below)	Metals: Total Metals (List Below)	Inorganics: TS TSS TDS Spec. Con.	Inorganics: Br Cl F SO_4 / NO_2 NO_3 NO_3NO_2	Inorganics: BOD CBOD T. Alk.	Inorganics: TKN NH_3 T. Phos. O. Phos.	Inorganics: pH T. Res. Chlorine	Inorganics: COD Phenols TOC DOC	Inorganics: Total Cyanide Total Sulfide	Inorganics: Reactive Cyanide Reactive Sulfide / Flashpoint Ignitability	Micro: Total Coliform E. Coli / Fecal Coliform	Micro: Enterococci / Heterotrophic Plate Count	Other: ASBESTOS	Other	Other	# of Containers	Notes MeOH Vial #
1 EAST											X		X													X				
2 EAST											X		X													X				
4 EAST											X		X													X				
5 EAST											X		X													X				
2 WEST											X		X													X				
4 WEST											X		X													X				
6 WEST											X		X													X				
8 WEST											X		X													X				

MATRIX: A-AIR; S-SOIL; GW-GROUND WATER; SW-SURFACE WATER; DW-DRINKING WATER; WW-WASTE WATER

PRESERVATIVE: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH

PROJECT MANAGER: KURT NELSON

COMPANY: EVERSOURCE

ADDRESS: 13 LEGENDS DRIVE

CITY: HOOKSETT STATE: NH ZIP: 03110

PHONE: 603-714-3031 EXT.:

FAX:

E-MAIL: KURT.NELSON@EVERSOURCE.COM

SITE NAME: SRP SUBMARINE CABLES

PROJECT #: T1276A

STATE: (NH) MA ME VT OTHER:

REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR GWP, OIL FUND, BROWNFIELD OR OTHER:

QUOTE #: 1014549 PO# 1014549

DATE NEEDED: 6/16/17

QA/QC REPORTING LEVEL A B C OR PRESUMPTIVE CERTAINTY

REPORTING OPTIONS PRELIMS: YES OR NO

ELECTRONIC OPTIONS E-MAIL PDF EQUIS EXCEL

TEMP. 25.2 °C ICE? YES (NO)

SAMPLER(S): [signature] KIN

RELINQUISHED BY: [signature] DATE: [redacted] 6-9-17 TIME: 12:47 RECEIVED BY: [signature]

RELINQUISHED BY: DATE: TIME: RECEIVED BY:

RELINQUISHED BY: DATE: TIME: RECEIVED BY:

METALS: 8 RCRA 13 PP FE, MN PB, CU

OTHER METALS: TCLP LEAD

SAMPLES FIELD FILTERED? ☐ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

* Collection date per customer 6/8/2017

SITE HISTORY:

SUSPECTED CONTAMINATION:

FIELD READINGS:

PA 6/12/17

Eastern Analytical, Inc. *professional laboratory and drilling services* 25 Chenell Drive | Concord, NH 03301 | Tel: 603.228.0525 | 1.800.287.0525 | E-Mail: CustomerService@EasternAnalytical.com | www.EasternAnalytical.com

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)

APPENDIX D

LS/Durocher Cable Removal Plan

Document type: **Procedure**		
Project: **Eversource Energy – 115kV Seacoast Reliability Project F107 Cable Project Madbury Substation to Portsmouth Substation, Little Bay, Portsmouth, NH**	Contractor's Document Number: **LSCA-EE-KIDMD017**	Issue: **DM 003**
Document title: **Cable Removal Plan-Revision 2**	Page: **1 of 10**	Category: **INTERNAL**

Issue:	Date:	Document Status:	Prepared:	Checked:	Approved:	Released:
003	04/10/17	Issued for Construction- Rev 2	TJP	BW/JB	04/10/17	04/10/17
002	04/10/17	Issued for Construction	TJP	BW/JB		
001	04/05/17	DRAFT	TJP	BW/JB		

Prime Contractor:

LS Cable & System

Cable Installation Contractor:

kokosing INDUSTRIAL

DUROCHER MARINE DIVISION

Owner:

EVERS

Kokosing Industrial
Durocher Marine Division
958 N. Huron Street
Cheboygan, MI 49721

TABLE OF CONTENTS

SUMMARY

Prior to any cable laying or plowing operations all obstructions and debris identified in the owners Geotechnical Survey and the Plow Assessment Survey should be removed by conducting Route Clearance (RC) and the Pre-Lay Grapnel Run (PLGR) operations. Figure 1 provides an overview of

Figure 1: Overview of charted out-of-service cables and clearance areas.

the proposed cable alignment overlaid with exsiting Out-of-Service (OOS) cables and where the utilities cross the chosen cable route.

Objective of the RC and PLGR is to help ensure that the selected route is clear and free from seabed and sub-surface debris, artificial hazards and out of service submarine utilities. It is intended that at the conclusion of the RC and PLGR operations, the route will be for the most part:

- Clear of any chains, wires, ropes, fishing equipment and any other items of equipment which may have been jettisoned, lost or abandoned that could hinder the plowing operation.
- Clear of abandoned or out of service utility cables
- Declared safe for cable laying and burial within the confines of the proposed route.

All debris brought on board the PLGR vessel would be properly disposed of. Should large obstructions or debris be encountered that cannot be handled by the cable recovery barge, additional plant will have to be mobilized to clear the obstructions.

ROUTE CLEARANCE (RC)

Based on owner supplied route survey documentation and recent contractor verification of the information; two areas have been identified requiring route clearance. Between Area-1 and Area-2 there is approximately 2600 feet of existing OOS cable to be cleared from the proposed cable route.

METHODOLOGY

Area-1 is located on the northeast side of Little Bay just off the Durham landing site. See figure 2

Figure 2: Route clearance area-1.

The route is crossed by two cables identified by the yellow and brown lines in Figure 2. The yellow line is a continuous OOS cable that crosses the Bay. See Figure 1. The brown line identifies a cable segment found on the surface within Area-1. Figure 3 shows three single core 1970 era cables observed in the western near shore area. Figure 4 shows approximate location of the three single core cables.

Description	Length in Feet
Yellow Line Cable	772
Brown Line Cable Segment	179

Anticipated turbidity levels during the cable removal process are expected to be low and ephemeral.

Figure 3: Three (3) single core cables.

Figure 4: Approximate distance from MHW to location where three (3) single core cables were found.

The following method would be used to recover and dispose of the existing OOS cables,

- Positively identify the abandoned circuit.
- Divers jet/expose the cable and mark cut location 50 feet outside of the cable permitted right of way (ROW) with a surface buoy. Only one cable would be removed at a time.
- Position the cable recovery barge on marker buoy.
- Rig the cable with a recovery line.
- Recover the cable to the deck and stopper off both sides of the bight.
- Cut the cable and apply heat shrink or cold shrink end cap to the segment being jettisoned overboard. Apply a temporary seal to the other cable segment end consisting of oil water absorbent pads and duct tape.
- Remove stopper on sealed end.
- Lower the sealed end to the seafloor outside of the cable ROW clear of the new proposed route
- Start cable recovery operations. Connect a winch wire to the end of the cable still on board of the barge. Remove stopper on the cable and pull a 20-foot length onto the barge. Cut the cable and place the segment into a watertight hopper bin.
- Repeat the process, maneuvering the barge under the cable to the opposite side of the ROW.
- At the opposite side of the ROW, cut and install heat shrink or cold shrink end cap, lower bitter end to Seafloor.
- Deliver scrap cable hopper bins to the owner for disposal.

POTENTIAL DEBRIS MITIGATION

The following methods will be employed to mitigate the possibility of loose debris in the water column and/or debris scattered or embedded in the substrate.

- Diver will inspect cable end while installing rigging to assess the integrity of the cable serving (outer layer) prior to lifting cable off Bay floor.
- An Eversource Energy representative will continuously inspect and monitor the condition of the cable as it is recovered onto the barge deck. Any disintegration of the cable will be visible immediately. This will identify what area will require debris recovery.
- Barge position will be logged real time by the barge navigation system during cable removal operations. If cable is recovered with signs of disintegration, barge position will be quick marked by the navigation system for future reference. This data would be used to position divers used to recover loose debris as needed.
- Tidal direction and velocity will be monitored and logged by barge crew to help assess what impacts this will have on any debris falling through the water column.
- Cable removal operations will begin in clearance area 1. This is very shallow water which limits the length of cable being handled and exposed through the water column.

- Figure 5 is a typical barge chute used for cable installation and removal operations.
- Option A is the use of a barge chute with rollers for removal operations. This will reduce the friction force acting on the serving. See figure 6 and 7.

Figure 5: Typical barge chute.

Figure 6: Option A barge chute with rollers.

Figure 7: Option A barge chute with rollers during removal of 4 cables simultaneously.

REMEDIAL DEBRIS RECOVERY

If disintegration of the existing cable jackets occurs upon removal, the follow steps will be used to clear any loose debris from the Bay floor and/or substrate.

- An initial survey will be performed in a small area suspect to contain loose debris with an ROV or dive team depending on the judgment of onsite management. This survey will provide information regarding the physical size of debris, the quantity of debris, location of the debris based on position of cable during removal, and if debris is visible on Bay floor.
- A three man dive team using surface supplied gear with USBL diver tracking will be mobilized for recovery of debris if necessary.
- Dive operations will be performed from a small maneuverable boat.
- The dive boat will be equipped with a DGPS navigation system operated by an onboard navigator/surveyor.
- Cable lay barge positioning collected during cable removal will be uploaded into the dive boat navigation system.
- Using the USBL system for diver positioning, dive boat navigator/surveyor will direct diver to loose debris.
- Diver will collect all loose debris by hand. A video camera mounted to the diver's helmet will allow topside personnel to view the recovery operation.

- This operation will continue collecting loose debris until owner's representative/inspector approves the area.
- All loose debris collected on each shift will be stored in approved containers and supplied to Eversource Energy for proper disposal.

Figure 8: Diver worn USBL transponder used to track and position diver real time.

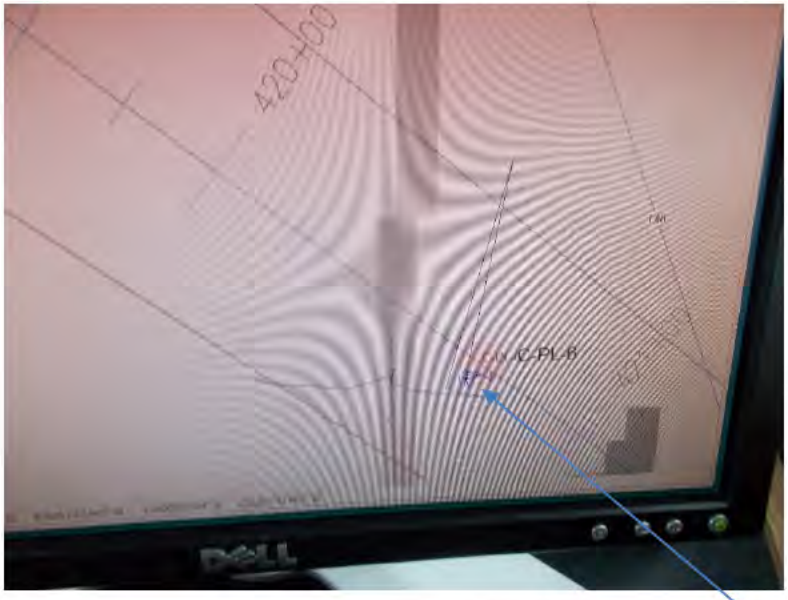

Figure 9: Topside monitor used to track diver while on the Bay floor. Note blue track line which gives the divers position real time. This allows the dive boat navigator/surveyor the ability to position diver on the exact target.

Figure 10: Installing heat shrink caps to seal ends of copper conductors.

Figure 11: Completed end seals with Kellum Grip installed.

Figure 12: Cutting cable segments for disposal.

Figure 13: Containerized cable segments.

Area-2 is located approximately midway across Little Bay. See fig 1. The total length to be removed is around 899 feet. The OOS cable enters ROW from the northwest for approximately 178 feet, runs south and parallel to the cable route for approximately 542 feet, then crosses the ROW again to the northeast for approximately 179 feet.

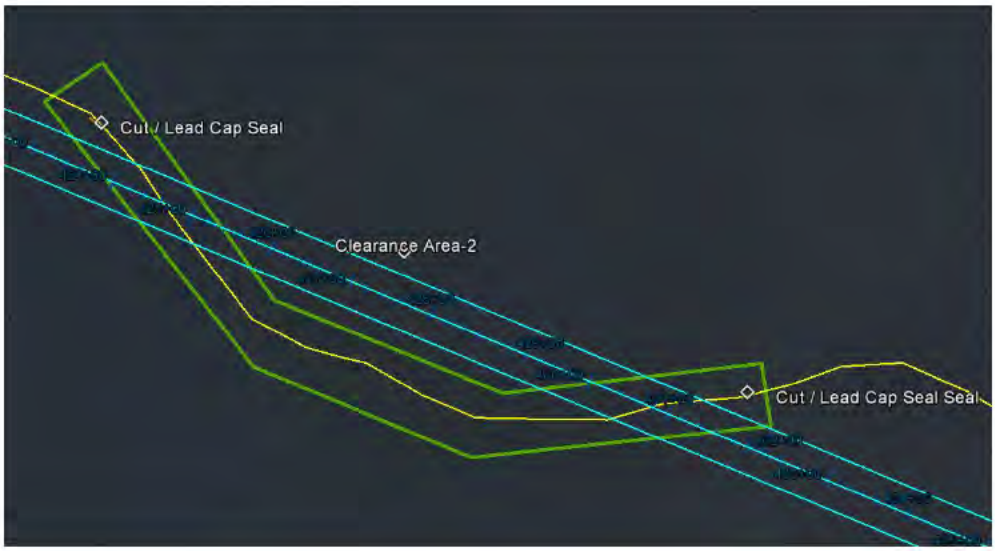

Figure 14: Area-2.

Area-2 would be cleared in the same manner as Area-1. The recovery barge would cut and seal the cable 50 feet outside of the ROW. The barge would then underrun and recover cable as it follows the lay of the OOS utility, finally capping the cable back on the north side.

PRE-LAY GRAPNEL RUN (PLGR)

Following the RC operations and prior to the cable installation, the Cable Lay Barge (CLB) will perform de-trenching run on the centerline of the proposed cable route. A de-trenching tool with a 2" thick 1 meter deep blade will be connected to the tow winch on the CLB and lowered to the bottom on the proposed line. The CLB then tows the tool along the cable line, usually in the same direction that the plow will be laying cable. The CLB tow winch wire is run through an in-line dynamometer on deck to monitor the line tension of the tow wire.

Figure 15: Detrenching grapnel.

The tension readings are used to identify when the de-trenching tool has hit an obstruction or has built up debris. When the tensions show a specified increase to the ambient bottom tension the tool is raised to the deck and any debris hooked is removed and disposed of. The spike in tension is usually very identifiable during these operations. The tool is then reset back on line overlapping the area where it was retrieved and the procedure continues until the entire route has been cleared.

POLLUTION PREVENTION

Effective preventive planning can go a long way in reducing the risk of accidental release of hazardous materials in to the environment. However, in spite of best efforts, spills can occur. When this happens, it is necessary to ensure that an effective response plan is in place to ensure a timely and coordinated effort to limit the adverse consequences of incidents involving the release oil and hazardous and noxious substances.

Prevention procedures are discussed with all personnel prior to commencement of barge operations. Equipment checks and routine maintenance are scheduled by the Barge Superintendent. Typically the tugboat chartered will have agreements in place and be operated under the guidelines of pollution prevention programs of US Coast Guard. The policies and practices as mandated by these

pollution prevention and reporting programs will be followed.

During the cutting and capping operation the primary method of controlling any inadvertent release of dielectric fluid will be containment. Containments are any device or structural construction able to hold or prevent contaminants from spilling on deck or entering the water. Containments could be pans that are slid under equipment, fabricated around equipment, buckets under valves, etc. The cable cutting area in the center of the barge will be a watertight shallow box welded to the deck of the barge. Some additional items that would need containments are listed below:

- Fuel Oil Storage Tanks
- Generators
- Deck machinery such as cable engines, anchor winches, hydraulic power packs.
- Cranes

Absorbent pads, absorbent granules and oil booms will be available for use should the need arises. These items will be placed in locations where they will be easily accessible.