

# Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing Completion Report (Final)

Shoal Point, NL – ENV-SP-2015-1



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To: Mr. Troy Duffy  
Department of Environment & Conservation

Date: December 18, 2015

From: Mr. Michael Spencer, P.Eng.  
Amec Foster Wheeler Environment & Infrastructure

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**FINAL**

**Investigation and Mitigation of Leaking Abandoned Underground Oil  
Well Casing, Shoal Point, NL  
Completion Report**

Submitted to:

**Department of Environment and Conservation**

Government of Newfoundland and Labrador  
35 Alabama Drive  
Stephenville, NL  
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Submitted by:

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18 December 2015

Amec Foster Wheeler Project #: TF1512740

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#### **IMPORTANT NOTICE**

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## 1.0 INTRODUCTION

Amec Foster Wheeler Environment and Infrastructure, a division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) was retained by the Government of Newfoundland and Labrador Department of Environment and Conservation (ENVC) to assist in the planning and implementation of a project to control the leakage of crude oil from an abandoned oil well located along the beach at Shoal Point, Newfoundland (refer to Figure 1). This abandoned, leaking, underground oil well casing was previously identified, investigated and assessed by Amec Foster Wheeler during summer 2015 under the report titled, *Assessment of Oil Seepage at Shoal Point, Port au Port Peninsula, Newfoundland and Labrador*.

### 1.1 Scope of Engineering Services

In assisting with this project, Amec Foster Wheeler was tasked to perform the following scope of engineering services:

- ▶ Conduct a site visit to collect topographical information and create a base plan of the proposed work area around the existing, leaking underground oil well casing,
- ▶ Develop a practical approach to investigating and controlling the oil leakages based on the available existing information and readily available materials, equipment and labour,
- ▶ Develop workable concepts and expand these designs into detailed engineered drawings,
- ▶ Prepare tender documents including detailed design drawings and specifications for the chosen design concept,
- ▶ Provide technical assistance and support during the government run tender process,
- ▶ Provide a technical, financial and administrative review of the submitted tenders and make recommends on contract award, and
- ▶ Provide contract administration and resident inspection services during construction including daily site reports and a final completion report.

## 2.0 PROJECT EXECUTION

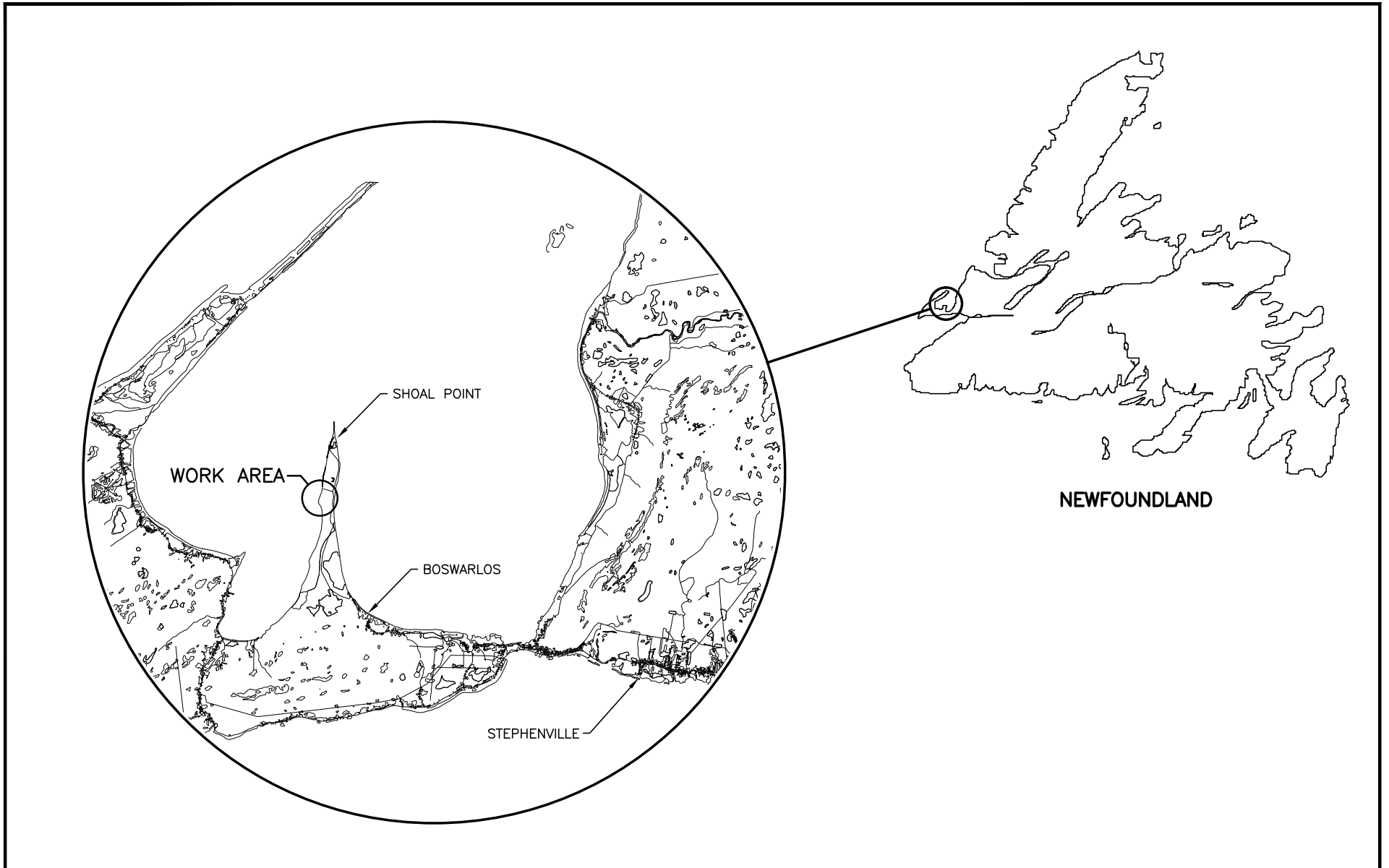
### 2.1 Engineering Phase



During the design engineering phase, various concepts were investigated. In the end, the first option recommended in the earlier Amec Foster Wheeler investigation and assessment report (August 2015) was adopted as the best viable option for success in consideration of the shorter work days and tidal range of the late fall. This option, using a large diameter metal culvert section and sandbags, was developed and further refined as shown in Figure 2.

Requiring critical consideration during the planning stages of the project was the influence of the available daylight hours and tidal cycle at the work site. A review of the daily high and low tides was conducted and a brief window of opportunity from November 16-26, 2015 was identified during daylight

hours where the tide was low enough to conduct the work. During this window, due to elevated tides, it was estimated that the actual workable time period for construction would last from approximately 2.5 hours before low tide to 2.5 hours after low tide for a total of 4-5 hours maximum. At these times, sea water levels were expected to be as high as 0.4 meters above the undisturbed beach level at the suspect casing location (-0.98m Geodetic). Copies of the project specific tide-time table and the overall project schedule are included in Appendices A and B respectively.

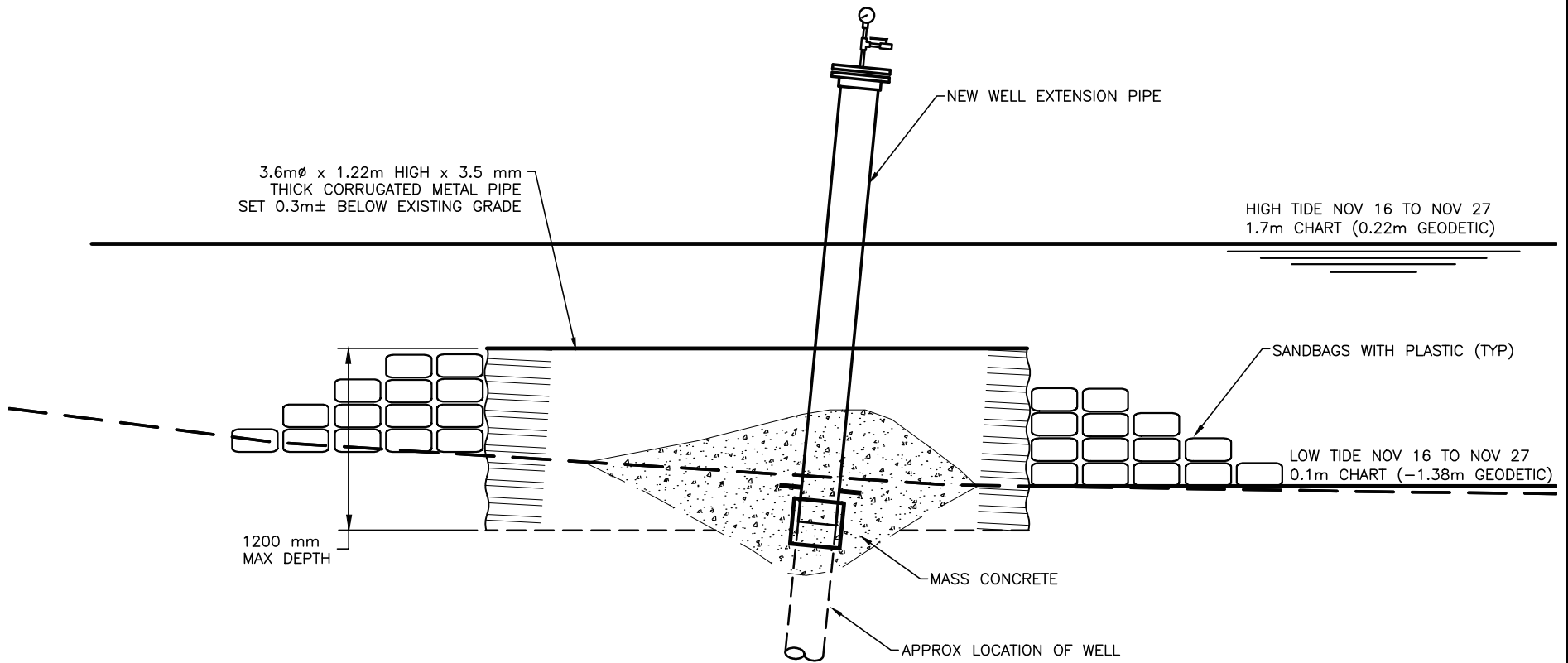
The concept design, design development and contract document stages of the project were executed as required under a compressed schedule and were ready for tender on October 21, 2015. See Appendix C for a copy of the contract drawings. After a foreshortened tender period and expedited tender review period, the construction project was awarded to Boyd & Bungay Construction Limited of Stephenville, NL.





 <b>Amec Foster Wheeler</b> Environment & Infrastructure 5 Union Street Corner Brook, NL A2H 5M7 709-634-0608	Date:	DECEMBER 11, 2015		Project:	INVESTIGATION AND MITIGATION OF LEAKING ABANDONED UNDERGROUND OIL WELL CASING	
	Client:	Drawn by:	C.G.		Title:	PROJECT LOCATION
 <b>DEPARTMENT OF ENVIRONMENT AND CONSERVATION</b>	Approved by:	M.S.		Scale:	N.T.S.	
				Project No.:	ENVC-SP-2015-1 TF1512740	
				Figure No.:	FIG 1.0	

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 <p>Amec Foster Wheeler Environment &amp; Infrastructure 5 Union Street Corner Brook, NL A2H 5M7 709-634-0608</p>	Date:	DECEMBER 11, 2015		Project:	INVESTIGATION AND MITIGATION OF LEAKING ABANDONED UNDERGROUND OIL WELL CASING	
	Drawn by:	C.G.		Title:	TYPICAL SECTION	
Client:	Approved by:	M.S.		Scale:	N.T.S.	Project No.: ENVC-SP-2015-1 TF1512740
 <p>DEPARTMENT OF ENVIRONMENT AND CONSERVATION</p>			Figure No.:	FIG 2.0		

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## 2.2 Construction Phase

### 2.2.1 Scope of Construction

The scope of work for the construction phase consisted of the provision of all necessary labour, materials and equipment and included the following:

- ▶ Assessment of the proposed access route to site to ensure the site accessibility for all required equipment,
- ▶ Location and isolation of the abandoned oil exploration well and preparation of the existing well casing as appropriate for receipt of a new coupling, extension pipe, and associated fittings,
- ▶ Supply and installation of the following items to isolate and control the oil seepage area:
  - ▶ 3600 mm x 1.22 m x 3.5 mm thick galvanized metal culvert,
  - ▶ Sufficient sand bags and 6 mil polyethylene sheeting to construct a 600 mm wall around the perimeter of the installed culvert and for seawater leakage control and access into and out of the culvert,
  - ▶ 61 m of offshore floating turbidity curtain system complete with anchors,
  - ▶ 115 m of offshore floating oil absorbent boom, 200 mm diameter with anchors,
  - ▶ 110 m of silt fence,
  - ▶ Miscellaneous materials for spill containment and absorption,
  - ▶ Robar Vantage Coupling, Model 1598 (or approved equal) and a schedule 40 steel extension pipe with all associated fittings, pipe restraints, pressure gauges and valves,
  - ▶ Concrete thrust block for restraint of the new extension pipe (Exposure Class C-1 Concrete, 35 MPa @ 28 days, Type GUb F/SF TerC<sup>3</sup> Cement),
- ▶ Supply and maintenance of intrinsically safe, water management controls within excavation,
- ▶ Transportation and disposal of contaminated soil to an approved treatment facility,
- ▶ Transportation, removal, and disposal of the items identified above in an acceptable manner and reinstatement of the work site to its original condition, and
- ▶ Atmospheric monitoring of work space for O<sub>2</sub>, CO, explosivity and toxic gases.

### 2.2.2 Construction Methodology

The Contractor executed the Work generally as follows:

- ▶ Excavation of the area surrounding the casing to install and seat the culvert endwise into the beach as indicated on the project drawings,
- ▶ Construction of a 600 mm sandbag wall including 6 mil polyethylene sheeting around the perimeter of the culvert to help anchor the culvert and assist in water tightness,
- ▶ Excavation within the culvert using a small to mid-sized excavator equipped with a small 750 mm width bucket to expose the end of the casing without disturbing the well casing,
- ▶ Removal of all excavated soil from the site for disposal at a certified soil treatment facility as hydrocarbon contaminated soils,

- ▶ Control of all surface and ground water present in excavation and work area which hinders the work or obstructs visual observation and discharge of such water at a location near the shoreline, outside the culvert and behind the turbidity curtain and oil absorbent boom,
- ▶ Exposition of underground, leaking oil well casing for visual examination of exposed casing by ENVC Site Engineer, and
- ▶ Preparation and/or rehabilitation of the casing end to permit installation of coupling, extension pipe and associated fittings in accordance with manufacturer's specifications. Alternatively some other method of mechanically sleeving or welding (subject to relevant hot work safety requirements) a capped extension casing onto the in-ground casing end may be required.

### **3.0 RESULTS**

The following summarizes the construction effort, encountered issues and the main results of this effort by Boyd & Bungay Construction Limited.

#### **November 16, 2015**

- ▶ Initial project kick-off and Health, Safety & Security (HSS) meeting was held at the office of Boyd & Bungay Construction Limited in Stephenville.
- ▶ The Contractor began mobilizing equipment and supplies to the main laydown area near the tip of Shoal Point.

#### **November 17, 2015**

- ▶ Tailgate HSS meeting was held (no reported issues).
- ▶ The Contractor continued mobilizing equipment and supplies to the site.
- ▶ The Contractor prepared and laid out the site, installing warning signs and barriers.
- ▶ High winds and snow caused some delay and issues accessing the site along the beach.

#### **November 18, 2015**

- ▶ Tailgate HSS meeting was held (no reported issues).
- ▶ Completed mobilization of equipment and supplies to the site.
- ▶ Installed turbidity curtain and oil absorbent booms.
- ▶ Received culvert on site.
- ▶ Dug test pits to gauge the general stratigraphy in the area and leveled the work area in preparation for the culvert installation.
- ▶ Access along the beach started to get difficult in certain locations.

#### **November 19, 2015**

- ▶ Tailgate HSS meeting was held (no reported issues).
- ▶ Installed culvert and sandbags around well casing No. 1.

- ▶ Exposed well casing No. 1 and found that the casing below the surface was in good physical condition without noticeable corrosion.
- ▶ Planned for the installation of the Robar coupling and extension pipe.

#### **November 20, 2015**

- ▶ Tailgate HSS meeting was held (no reported issues).
- ▶ Installed Robar coupling and 150 mm diameter extension pipe.
- ▶ Placed required concrete thrust block.
- ▶ Removed culvert.
- ▶ Beach access became somewhat difficult for wheeled vehicular access especially near high tide. Vehicles are now getting stuck routinely in certain locations.
- ▶ A second well casing south of well casing No. 1 was observed to be leaking oil. ENVC made the decision to investigate and remedy this well casing as well after the completion of well casing No. 1 as weather, time and tide permits. In advance of exposing the second well casing and based on the observed condition of well casing no. 1, it was decided that a welded connection between the new extension pipe and the existing casing would be the best and most expedient option to complete the connection within the time remaining within the workable tide cycle. Amec Foster Wheeler devised a welding detail and forwarded to the contractor for implementation.

#### **November 21, 2015**

- ▶ Tailgate HSS meeting was held (no reported issues).
- ▶ Finished installing top flange and fittings on the top of well casing No. 1 extension pipe.
- ▶ Began relocating turbidity curtain, oil booms, and culvert to well casing No. 2.
- ▶ Removed contaminated soil including sand bags and plastic to a disposal facility in Stephenville.

#### **November 22, 2015**

- ▶ Tailgate HSS meeting was held (no reported issues).
- ▶ Completed new Job Safety Analysis (JSA) for welding at well casing No. 2.
- ▶ Completed culvert relocation to well casing No. 2.
- ▶ Exposed well casing No. 2, installed the extension pipe and welded the connection between the old and new pipes.
- ▶ Began demobilizing equipment and materials from site (20% complete).
- ▶ Beach access to site was very difficult.

#### **November 23, 2015**

- ▶ Completed demobilization of equipment and materials from site.
- ▶ Reinstated disturbed work area along beach.

A photo journal of the construction activities can be found in Appendix D and daily construction reports by Amec Foster Wheeler's Site Engineer can be found in Appendix E.

#### **4.0 CONCLUSIONS & RECOMMENDATIONS**

Amec Foster Wheeler assisted the Department of Environment and Conservation in the planning and implementation of a project to control the leakage of crude oil from an abandoned oil well located along the beach at Shoal Point, Newfoundland. During the process of construction, a second leaking oil well casing was encountered just south of well casing No. 1. Overall, the project met with success. The tight schedule, although challenging due to shortened days and tidal fluctuations, was achieved. Likewise, budget expectations were met. The general contractor hired for this project, Boyd & Bungay Construction Limited, performed admirably and met all of the intended objectives.

As indicated in the planning stages of this project, the solution implemented by the current contract was meant only to be temporary in nature to control the oil leakages at these locations. Winter ice and tides can be particularly damaging to these well casings. This in combination with the recent and continued erosion and redistribution of shoreline and beach soils develops concern that the casings may again be compromised. The new casing extensions are not as strong or secure as the original continuous casings. It is recommended that these wells be decommissioned properly using industry standard techniques and protocols in consultation with regulatory authorities (i.e., including Provincial Department of Natural Resources). Furthermore, it is recommended that the permanent decommissioning of these well casings be undertaken as soon as possible to avoid deterioration of the well casings that may again lead to continued release of oil to the receiving environment. In the interim, while awaiting a more permanent solution, wells should be monitored (in consultation with regulatory authorities) at least monthly, for changes in well condition, leakage and well casing pressure.

## 5.0 CLOSURE

This completion report has been prepared for the exclusive use of the Government of Newfoundland and Labrador, Department of Environment and Conservation. The scope of engineering services was conducted in accordance with written requests from the Client. No further warranty, expressed or implied, is made. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Amec Foster Wheeler accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report

Yours sincerely,

**Amec Foster Wheeler Environment & Infrastructure,  
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## 6.0 REFERENCES

Amec Foster Wheeler. 2015. Assessment of Oil Seepage at Shoal Point Port au Port Peninsula, Newfoundland and Labrador Summary Report. Prepared for Government of Newfoundland and Labrador, Department of Environment and Conservation, St. John's, NL.  
[www.env.gov.nl.ca/env/env\\_protection/Shoal\\_Point\\_Report.pdf](http://www.env.gov.nl.ca/env/env_protection/Shoal_Point_Report.pdf)

GovNL Note: Report is located at [www.env.gov.nl.ca/env/env\\_protection/ics/pdf/Shoal\\_Point\\_Assessment.pdf](http://www.env.gov.nl.ca/env/env_protection/ics/pdf/Shoal_Point_Assessment.pdf)



# Appendix A - Project Specific Tide-Time Table



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Department of Environment and Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

**Legend**

	Daylight and Tide are Acceptable
	Darkness Hour
	Daylight Hour

Maximum Permissible Height of Water During Construction = 0.40 m  
Elevation of Beach at Well = - 1.37 m  
Maximum Permissible Water Elevation = - 0.97 m

Maximum Work Hours	2	3	3.5	4.5	5	4.5	4.5	4.5	3.5	2.5	1.5	0.5
Sunrise	7:38 AM	7:40 AM	7:42 AM	7:43 AM	7:45 AM	7:46 AM	7:48 AM	7:49 AM	7:51 AM	7:52 AM	7:54 AM	7:55 AM
Sunset	4:47 PM	4:46 PM	4:45 PM	4:43 PM	4:42 PM	4:42 PM	4:41 PM	4:40 PM	4:39 PM	4:38 PM	4:37 PM	4:37 PM

	16-Nov-15	17-Nov-15	18-Nov-15	19-Nov-15	20-Nov-15	21-Nov-15	22-Nov-15	23-Nov-15	24-Nov-15	25-Nov-15	26-Nov-15	27-Nov-15
12:00 AM	-0.38	-0.48	-0.68	-0.88	-0.98	-1.08	-1.08	-0.98	-0.78	-0.58	-0.38	-0.18
12:30 AM	-0.33	-0.43	-0.58	-0.78	-0.93	-1.08	-1.13	-1.08	-0.98	-0.78	-0.53	-0.33
1:00 AM	-0.28	-0.38	-0.48	-0.68	-0.88	-1.08	-1.18	-1.18	-1.18	-0.98	-0.68	-0.48
1:30 AM	-0.33	-0.33	-0.43	-0.58	-0.78	-0.98	-1.18	-1.23	-1.28	-1.13	-0.88	-0.63
2:00 AM	-0.38	-0.28	-0.38	-0.48	-0.68	-0.88	-1.18	-1.28	-1.38	-1.28	-1.08	-0.78
2:30 AM	-0.43	-0.33	-0.38	-0.43	-0.63	-0.83	-1.08	-1.28	-1.38	-1.38	-1.23	-0.98
3:00 AM	-0.48	-0.38	-0.38	-0.38	-0.58	-0.78	-0.98	-1.28	-1.38	-1.48	-1.38	-1.18
3:30 AM	-0.63	-0.48	-0.43	-0.38	-0.48	-0.68	-0.88	-1.18	-1.33	-1.48	-1.48	-1.33
4:00 AM	-0.78	-0.58	-0.48	-0.38	-0.38	-0.58	-0.78	-1.08	-1.28	-1.48	-1.58	-1.48
4:30 AM	-0.93	-0.68	-0.53	-0.43	-0.38	-0.48	-0.68	-0.93	-1.18	-1.43	-1.53	-1.53
5:00 AM	-1.08	-0.78	-0.58	-0.48	-0.38	-0.38	-0.58	-0.78	-1.08	-1.38	-1.48	-1.58
5:30 AM	-1.18	-0.93	-0.73	-0.53	-0.38	-0.33	-0.43	-0.63	-0.93	-1.23	-1.43	-1.53
6:00 AM	-1.28	-1.08	-0.88	-0.58	-0.38	-0.28	-0.48	-0.78	-1.08	-1.38	-1.48	-1.48
6:30 AM	-1.33	-1.18	-0.98	-0.68	-0.43	-0.28	-0.23	-0.33	-0.58	-0.88	-1.18	-1.38
7:00 AM	-1.38	-1.28	-1.08	-0.78	-0.48	-0.28	-0.18	-0.18	-0.38	-0.68	-0.98	-1.28
7:30 AM	-1.38	-1.33	-1.18	-0.88	-0.58	-0.33	-0.18	-0.08	-0.23	-0.48	-0.78	-1.08
8:00 AM	-1.38	-1.38	-1.28	-0.98	-0.68	-0.38	-0.18	0.02	-0.08	-0.28	-0.58	-0.88
8:30 AM	-1.28	-1.33	-1.28	-1.08	-0.83	-0.48	-0.23	0.02	0.02	-0.13	-0.38	-0.68
9:00 AM	-1.18	-1.28	-1.28	-1.18	-0.98	-0.58	-0.28	0.02	0.12	0.02	-0.18	-0.48
9:30 AM	-1.03	-1.18	-1.28	-1.23	-1.08	-0.73	-0.43	-0.08	0.12	0.12	-0.03	-0.28
10:00 AM	-0.88	-1.08	-1.28	-1.28	-1.18	-0.88	-0.58	-0.18	0.12	0.22	0.12	-0.08
10:30 AM	-0.73	-0.98	-1.18	-1.23	-1.23	-0.98	-0.73	-0.33	-0.03	0.17	0.17	0.07
11:00 AM	-0.58	-0.88	-1.08	-1.18	-1.28	-1.08	-0.88	-0.48	-0.18	0.12	0.22	0.22
11:30 AM	-0.43	-0.73	-0.93	-1.13	-1.23	-1.13	-0.98	-0.68	-0.33	0.02	0.17	0.22
12:00 PM	-0.28	-0.58	-0.78	-1.08	-1.18	-1.18	-1.08	-0.88	-0.48	-0.08	0.12	0.22
12:30 PM	-0.18	-0.43	-0.68	-0.93	-1.13	-1.18	-1.18	-0.98	-0.68	-0.28	-0.03	0.17
1:00 PM	-0.08	-0.28	-0.58	-0.78	-1.08	-1.18	-1.28	-1.08	-0.88	-0.48	-0.18	0.12
1:30 PM	-0.03	-0.18	-0.43	-0.68	-0.98	-1.13	-1.28	-1.18	-0.98	-0.68	-0.33	-0.03
2:00 PM	0.02	-0.08	-0.28	-0.58	-0.88	-1.08	-1.28	-1.28	-1.08	-0.88	-0.48	-0.18
2:30 PM	-0.03	-0.08	-0.23	-0.48	-0.73	-0.98	-1.18	-1.28	-1.18	-1.03	-0.68	-0.38
3:00 PM	-0.08	-0.08	-0.18	-0.38	-0.58	-0.88	-1.08	-1.28	-1.28	-1.18	-0.88	-0.58
3:30 PM	-0.18	-0.13	-0.13	-0.28	-0.48	-0.78	-0.98	-1.23	-1.28	-1.23	-1.03	-0.73
4:00 PM	-0.28	-0.18	-0.08	-0.18	-0.38	-0.68	-0.88	-1.18	-1.28	-1.28	-1.18	-0.88
4:30 PM	-0.38	-0.23	-0.13	-0.13	-0.28	-0.53	-0.78	-1.03	-1.23	-1.28	-1.23	-1.03
5:00 PM	-0.48	-0.28	-0.18	-0.08	-0.18	-0.38	-0.68	-0.88	-1.18	-1.28	-1.28	-1.18
5:30 PM	-0.63	-0.43	-0.23	-0.13	-0.13	-0.28	-0.53	-0.78	-1.03	-1.18	-1.28	-1.23
6:00 PM	-0.78	-0.58	-0.28	-0.18	-0.08	-0.18	-0.38	-0.68	-0.88	-1.08	-1.28	-1.28
6:30 PM	-0.88	-0.68	-0.43	-0.23	-0.13	-0.13	-0.28	-0.53	-0.73	-0.98	-1.18	-1.23
7:00 PM	-0.98	-0.78	-0.58	-0.28	-0.18	-0.08	-0.18	-0.38	-0.58	-0.88	-1.08	-1.18
7:30 PM	-1.03	-0.88	-0.68	-0.43	-0.28	-0.13	-0.13	-0.23	-0.43	-0.68	-0.93	-1.08
8:00 PM	-1.08	-0.98	-0.78	-0.58	-0.38	-0.18	-0.08	-0.08	-0.28	-0.48	-0.78	-0.98
8:30 PM	-1.03	-0.98	-0.88	-0.68	-0.48	-0.28	-0.13	-0.08	-0.18	-0.33	-0.63	-0.83
9:00 PM	-0.98	-0.98	-0.98	-0.78	-0.58	-0.38	-0.18	-0.08	-0.08	-0.18	-0.48	-0.68
9:30 PM	-0.93	-0.98	-0.98	-0.88	-0.73	-0.53	-0.28	-0.13	-0.08	-0.13	-0.33	-0.53
10:00 PM	-0.88	-0.98	-0.98	-0.98	-0.88	-0.68	-0.38	-0.18	-0.08	-0.08	-0.18	-0.38
10:30 PM	-0.78	-0.93	-0.98	-1.03	-0.98	-0.78	-0.53	-0.33	-0.18	-0.08	-0.13	-0.28
11:00 PM	-0.68	-0.88	-0.98	-1.08	-1.08	-0.88	-0.68	-0.48	-0.28	-0.08	-0.08	-0.18
11:30 PM	-0.58	-0.78	-0.93	-1.03	-1.08	-0.98	-0.83	-0.63	-0.43	-0.23	-0.13	-0.13

**Assumptions**

- 1.0 Chart Datum to Geodetic Conversion Factor = - 1.48 m
- 2.0 Elevations shown reference Geodetic Datum in meters.

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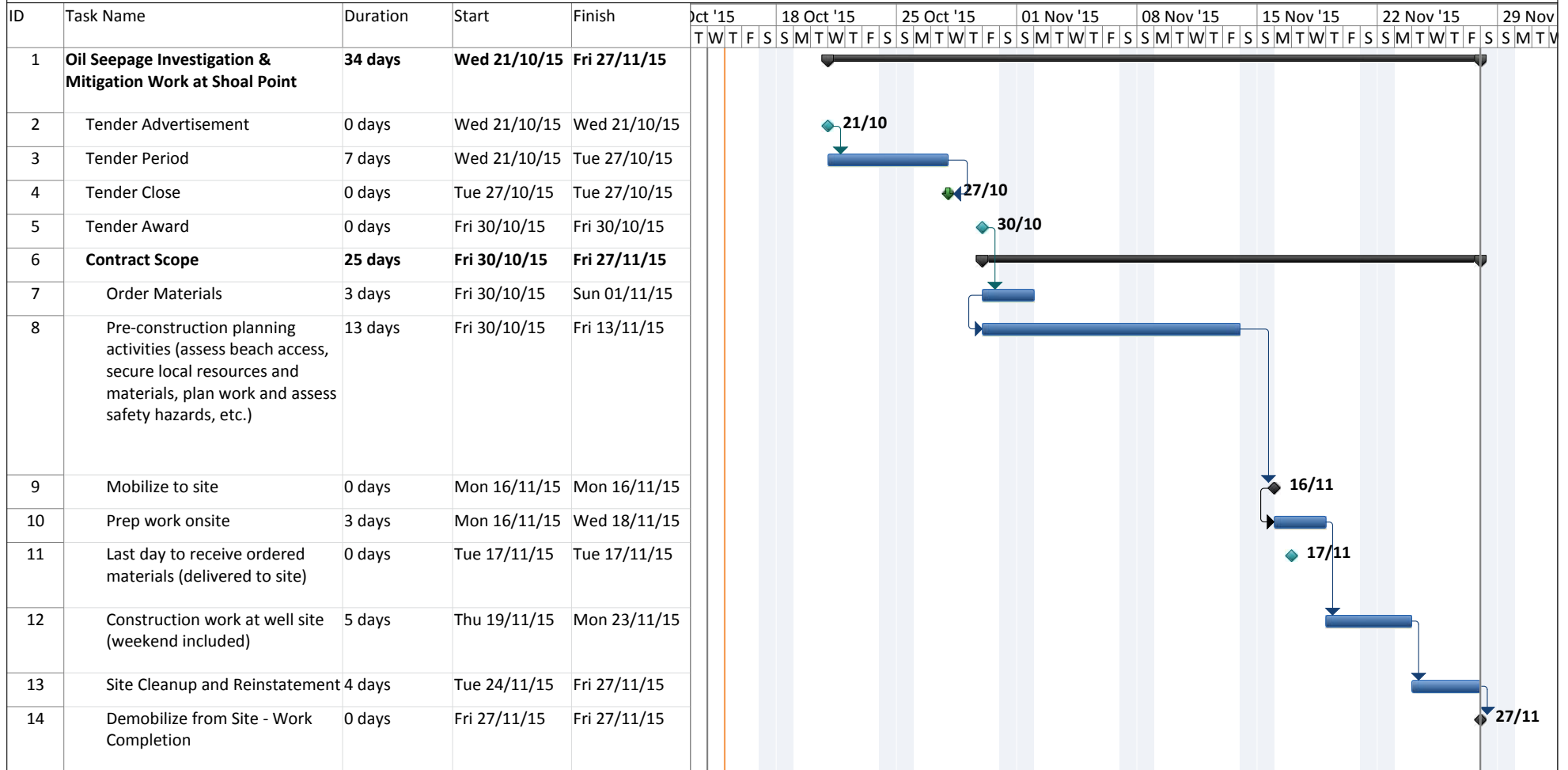
# Appendix B - Project Schedule



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**DEPARTMENT OF ENVIRONMENT & CONSERVATION**  
**INVESTIGATION AND MITIGATION OF LEAKING ABANDONED UNDERGROUND OIL WELL CASING**  
**SHOAL POINT, NL**  
**OCTOBER 2015**

**PROJECT MILESTONE SCHEDULE**

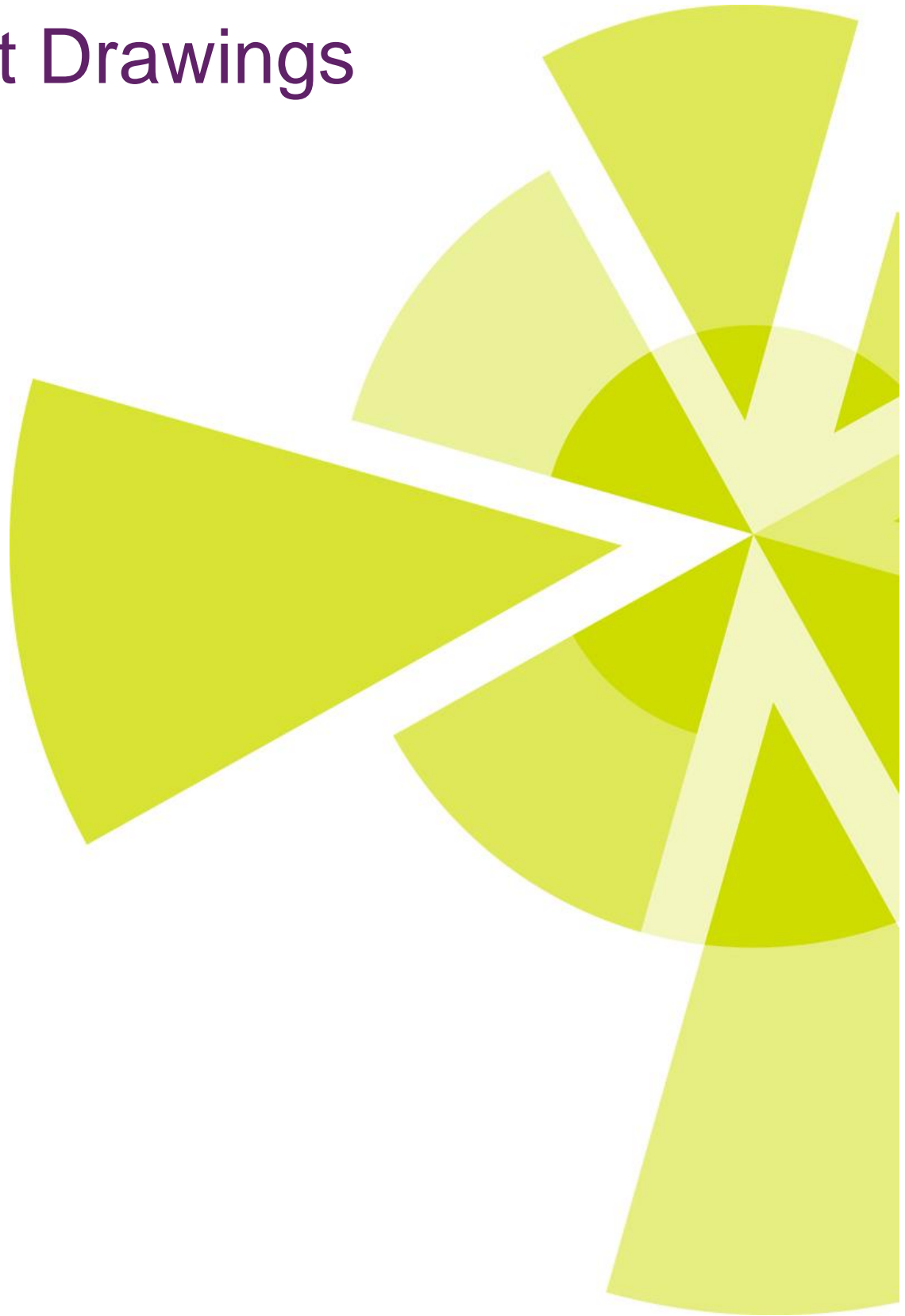


Project: Project Milestone Schedu Date: Thu 15/10/15	Task		External Milestone		Manual Summary Rollup	
	Split		Inactive Task		Manual Summary	
	Milestone		Inactive Milestone		Start-only	
	Summary		Inactive Summary		Finish-only	
	Project Summary		Manual Task		Deadline	
	External Tasks		Duration-only		Progress	

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# Appendix C - Contract Drawings



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DEPARTMENT OF ENVIRONMENT AND CONSERVATION

INVESTIGATION AND MITIGATION OF LEAKING ABANDONED UNDERGROUND OIL WELL CASING SHOAL POINT, NL

CLIENT PROJECT NO. : ENVC-SP-2015-1
AMECFW PROJECT NO. : TF1512740
ISSUED FOR CONSTRUCTION

NOVEMBER 13, 2015

CLIENT:
GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
4th FLOOR, WEST BLOCK CONFEDERATION BUILDING, P.O. BOX 8700 ST. JOHN'S, NL A1B 4J6

PRIME CONSULTANTS:
AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE

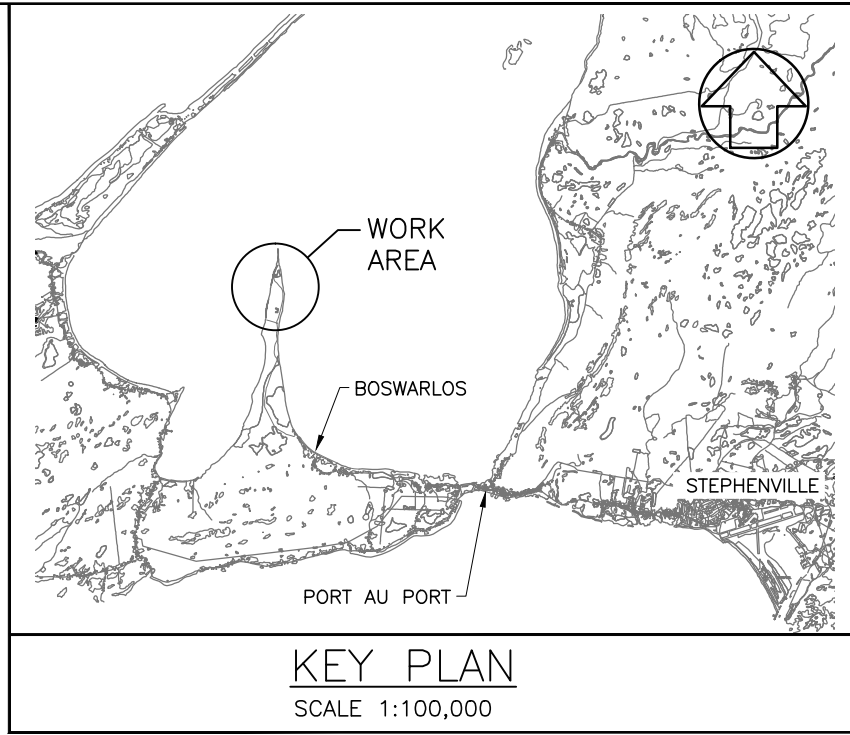
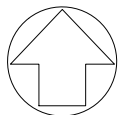
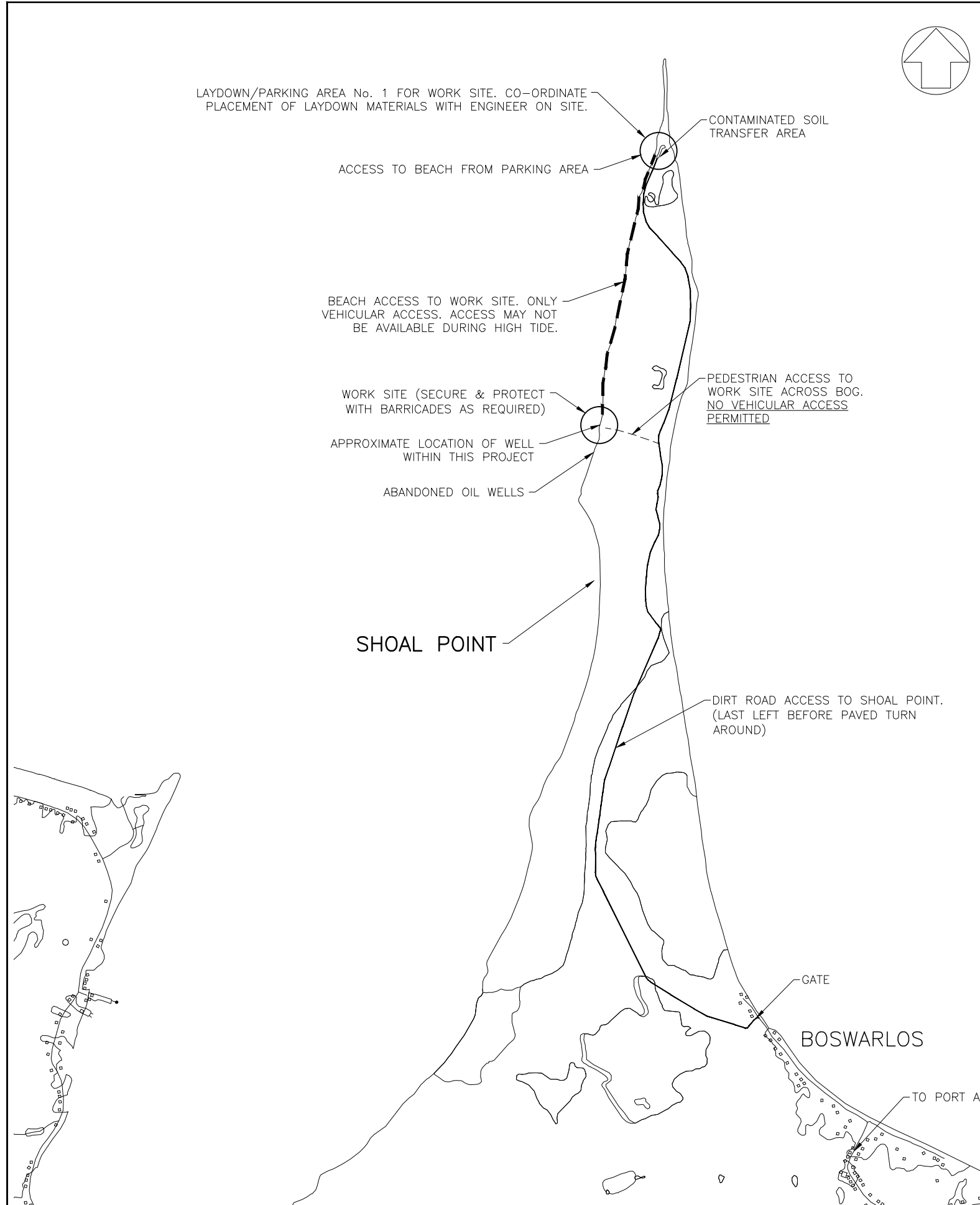
DRAWING LIST:

Table with 2 columns: DWG. No. and TITLE. Rows include C01 LOCATION PLAN, C02 SITE PLAN, and C03 PROFILE & DETAILS.

Provincial permit holder information for AMEC FOSTER WHEELER AMERICAS LIMITED, including permit details and validity date.



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- NOTES:**
1. ALL DIMENSIONS ARE IN METRES.
  2. DO NOT SCALE FROM DRAWING.
  3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE WORK AREA IN SUPPORT OF THIS PROJECT.
  4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
  5. THIS DRAWING CONTAINS INTELLECTUAL PROPERTY OF THE CLIENT AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.

No.	Date	Description	Drawn	Chk'd	App'd
1	Nov 13 '15	Issued for Construction	CG	RW	MS
0	Oct 19 '15	Issued for Tender	CG	RW	MS
P1	Oct 16 '15	Issued for Review	CG	KP	MS

**LEGEND:**

PROVINCE OF NEWFOUNDLAND AND LABRADOR

**PEG**  
Professional Engineers and Geoscientists  
Newfoundland and Labrador

PERMIT HOLDER  
This Permit Allows

AMEC FOSTER WHEELER AMERICAS LIMITED

To practice Professional Engineering in Newfoundland and Labrador.  
Permit No. as issued by PEG 00018  
which is valid for the year 2015.

**PROFESSIONAL ENGINEER**  
MICHAEL SPENCER  
SIGNATURE  
Nov 13, 2015  
DATE  
NEWFOUNDLAND & LABRADOR

**amec foster wheeler**

Environment & Infrastructure  
5 Union Street  
Corner Brook, NL A2H 5M7  
T: (709) 634-6600

Client:

**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Project:

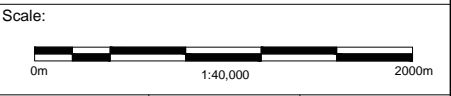
**INVESTIGATION AND MITIGATION OF LEAKING ABANDONED UNDERGROUND OIL WELL CASING SHOAL POINT, NL**

Drawing Title:

**LOCATION PLAN**

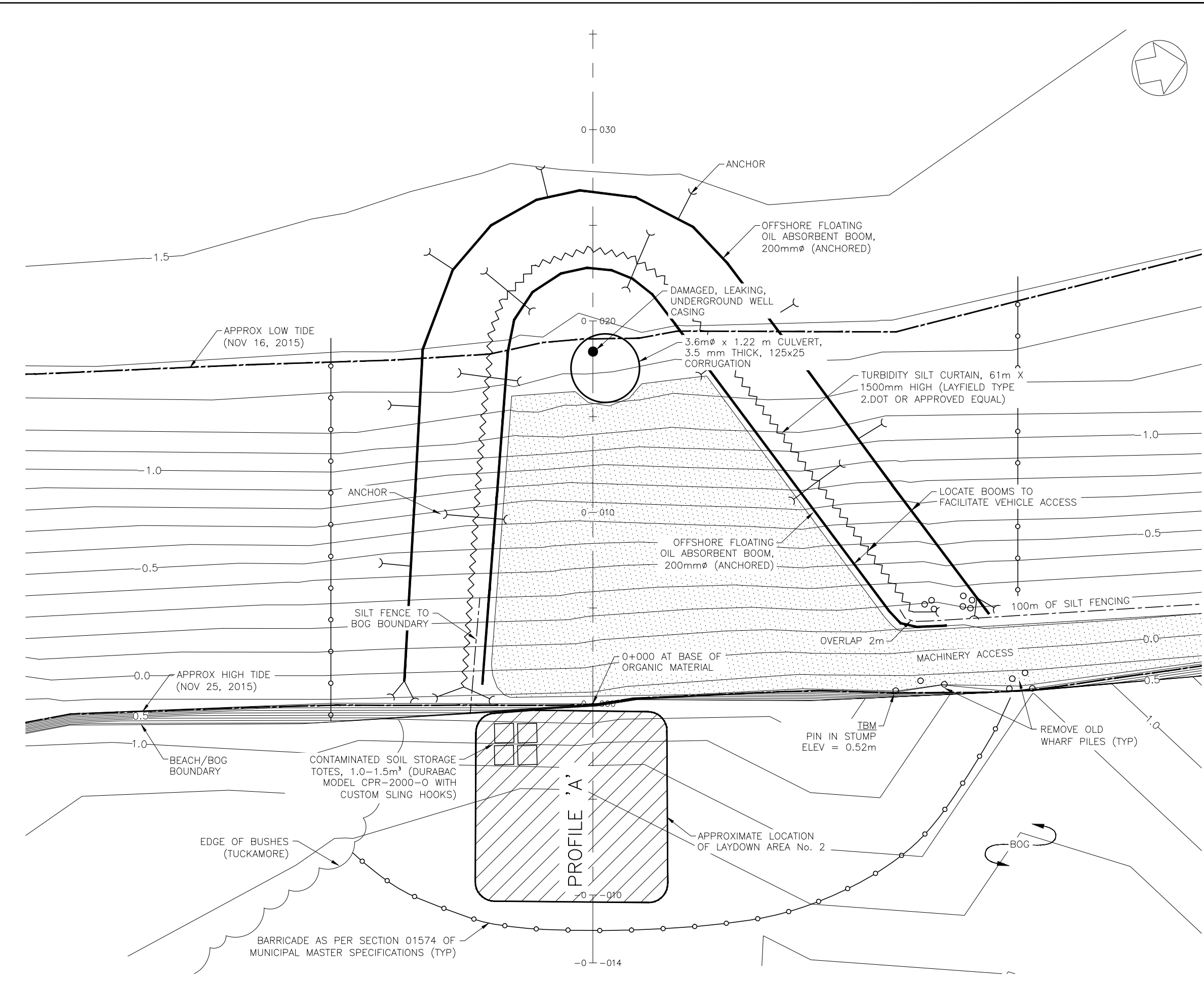
Project Number:

**AMEC FOSTER WHEELER - TF1512740**



Drawn By: C. Greene	Reviewed By: R. Winsor	Approved By: M. Spencer
Drawing No.: C01	Date: Oct 2015	Rev. No.: 1

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**NOTES:**

1. ALL DIMENSIONS ARE IN METRES.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE WORK AREA IN SUPPORT OF THIS PROJECT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS DRAWING CONTAINS INTELLECTUAL PROPERTY OF THE CLIENT AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.

No.	Date	Description	Drawn	Chk'd	App'd
1	Nov 13 '15	Issued for Construction	CG	RW	MS
0	Oct 19 '15	Issued for Tender	CG	RW	MS
P2	Oct 16 '15	Issued for Review	CG	KP	MS
P1	Oct 11 '15	Issued for Discussion	CG		MS

**LEGEND:**

PROVINCE OF NEWFOUNDLAND AND LABRADOR  
**PEG**  
Professional Engineering and Land Surveying  
 AMEC FOSTER WHEELER AMERICAS LIMITED  
 To practice Professional Engineering in Newfoundland and Labrador  
 Permit No. as issued by PEG 00018  
which is valid for the year 2015.

PERMIT HOLDER  
 This Permit Allows  
  
 MICHAEL P. SPENCER  
 REGISTERED PROFESSIONAL ENGINEER  
 Nov 13, 2015  
 DATE  
 NEWFOUNDLAND & LABRADOR

**Environment & Infrastructure**  
 5 Union Street  
 Corner Brook, NL, A2H 5M7  
 T: (709) 634-6600

Client:  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Project:  
**INVESTIGATION AND MITIGATION OF LEAKING ABANDONED UNDERGROUND OIL WELL CASING SHOAL POINT, NL**

Drawing Title:  
**SITE PLAN**

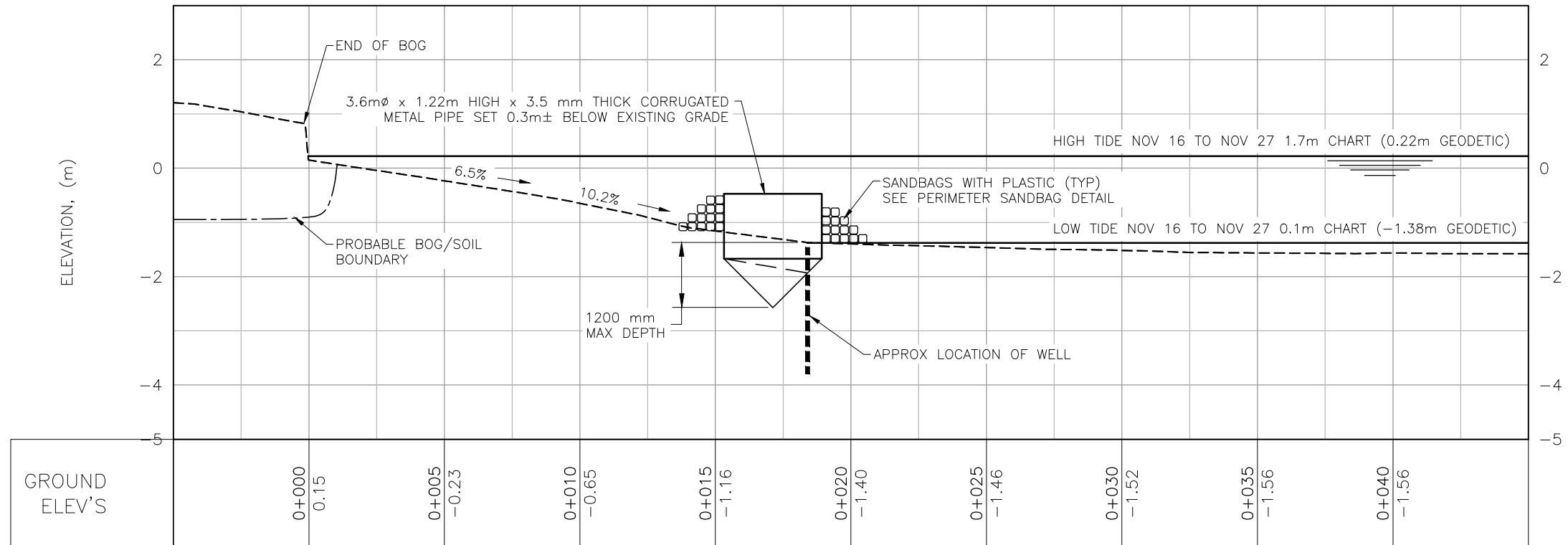
Project Number:  
**AMEC FOSTER WHEELER - TF1512740**

Scale:

Drawn By: <b>C. Greene</b>	Reviewed By: <b>R. Winsor</b>	Approved By: <b>M. Spencer</b>
Drawing No.: <b>C02</b>	Date: <b>Oct 2015</b>	Rev. No.: <b>1</b>

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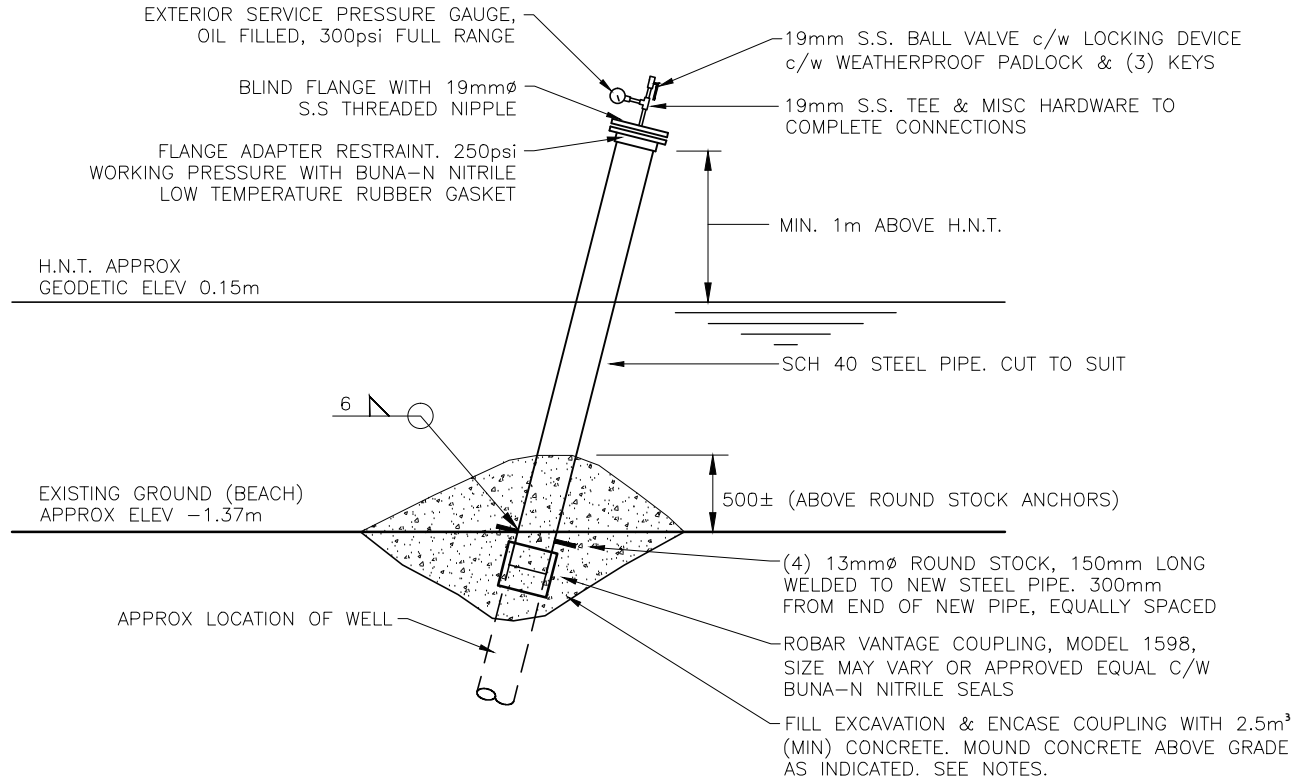
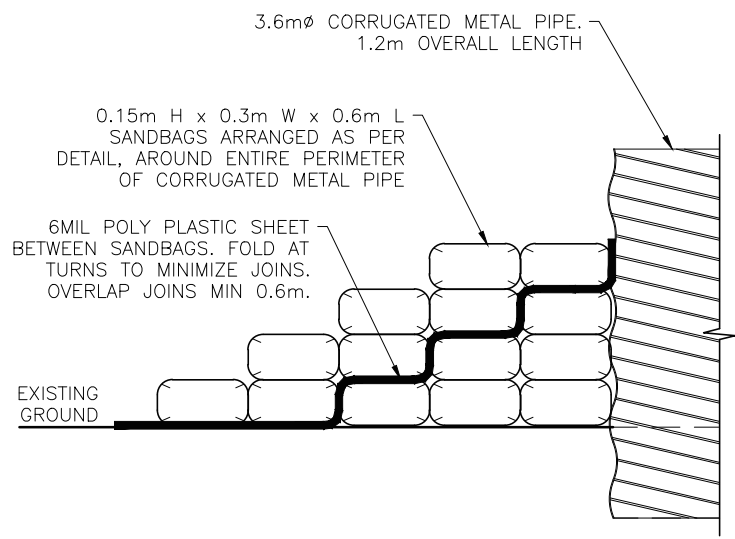




ELEVATION, (m)

GROUND ELEV'S

**PERIMETER SAND BAG DETAIL**  
SCALE 1:25



**WELL CONNECTION DETAIL**  
SCALE 1:50

**NOTES:**

1. ALL DIMENSIONS ARE IN METRES.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE WORK AREA IN SUPPORT OF THIS PROJECT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS DRAWING CONTAINS INTELLECTUAL PROPERTY OF THE CLIENT AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
6. CONCRETE SHALL BE:  
EXPOSURE CLASS C-1, 35MPa @ 28 DAYS  
TYPE Gub F/SF TERC 3 CEMENT

No.	Date	Description	Drawn	Chk'd	App'd
1	Nov 13 '15	Issued for Construction	CG	RW	MS
0	Oct 19 '15	Issued for Tender	CG	RW	MS
P2	Oct 16 '15	Issued for Review	CG	KP	MS
P1	Oct 11 '15	Issued for Discussion	CG	RW	MS

**LEGEND:**

PROVINCE OF NEWFOUNDLAND AND LABRADOR  
**PEG**  
 Registered Professional Engineer  
 AMEC FOSTER WHEELER AMERICAS LIMITED  
 To practice Professional Engineering in Newfoundland and Labrador  
 Permit No. as issued by PEG 00018  
 which is valid for the year 2015.



**Environment & Infrastructure**  
 5 Union Street  
 Corner Brook, NL, A2H 5M7  
 T: (709) 634-6000

Client:  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Project:  
**INVESTIGATION AND MITIGATION OF LEAKING ABANDONED UNDERGROUND OIL WELL CASING SHOAL POINT, NL**

Drawing Title:  
**PROFILE & DETAILS**

Project Number:  
**AMEC FOSTER WHEELER - TF1512740**

Scale:  
 0m 10m  
 V 1:100  
 H 1:200

Drawn By: C. Greene	Reviewed By: R. Winsor	Approved By: M. Spencer
Drawing No.: C03	Date: Oct 2015	Rev. No.: 1

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# Appendix D - Construction Photos



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Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---

NOVEMBER 18, 2015 (PHOTOS 1 – 6)



*Photo 1 – Arrival of culvert at site in Shoal Point.*



*Photo 2 – View of mobilized contractor equipment at the lay down area.*

---

**Department of Environment & Conservation**  
**Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing**  
**Shoal Point, NL**

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*Photo 3 - Contractor installing turbidity curtain in water around well casing No. 1 work area.*



*Photo 4 – View of second equipment laydown area adjacent work site.*

---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---



*Photo 5 – Note soft beach conditions.*



*Photo 6 – Oil booms and turbidity curtain installed and anchored in position.*



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Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

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NOVEMBER 19, 2015 (PHOTOS 1 – 8)



*Photo 1 – Contractor installing culvert and sand bags at well casing No. 1 location.*



*Photo 2 - View of silt fence in position along beach access.*



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Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

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*Photo 3 – Sand bags used to help seal around perimeter of 3.6 m  $\varnothing$  culvert.*

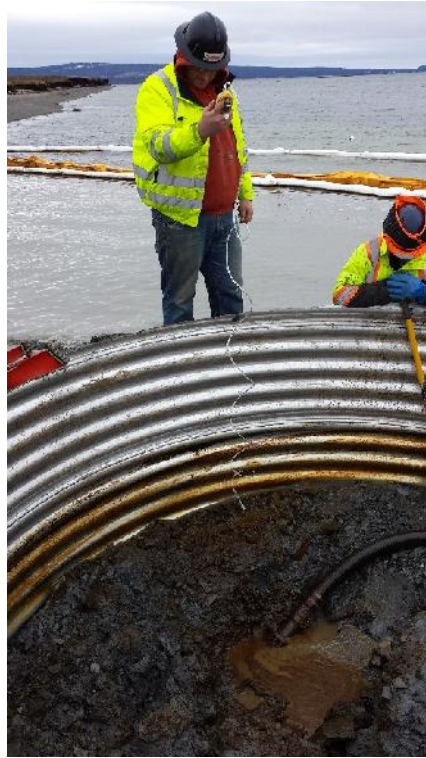


*Photo 4 – Pumping the water out of the installed culvert.*

---

**Department of Environment & Conservation**  
**Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing**  
**Shoal Point, NL**

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*Photo 5 – Contractor conducting atmospheric monitoring of work space prior to entry.*



*Photo 6 – Exposed abandoned leaking oil well casing No. 1.*

---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---



*Photo 7 – View south of second leaking oil well casing beyond oil absorbent booms and turbidity curtain.*



*Photo 8 – Close-up view of leaking oil well casing No. 2 to the south of the main well casing.*



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Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

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NOVEMBER 20, 2015 (PHOTOS 1 – 8)



*Photo 1 – View of work site at beginning of second day of construction (Well Casing No. 1).*



*Photo 2 – Exposed well casing No.1 with existing threaded coupling attached.*

---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

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*Photo 3 – Well casing No. 1 with adapter coupling in position.*



*Photo 4 – Workers installing 150 mm  $\varnothing$  pipe extension.*



---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---



*Photo 5 – Contractor encountered challenging conditions along beach access.*



*Photo 6 – Megalugs installed at base of new pipe extension.*

---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---



*Photo 7 – Concrete fill placed around coupling and megalugs.*



*Photo 8 – Well casing No. 1 completed.*

---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---

NOVEMBER 21, 2015 (PHOTOS 1 – 2)



*Photo 1 – View of completed well casing extension (Well Casing No. 1).*



*Photo 2 – View of installed pressure gauge and lockable outlet valve.*



---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---

NOVEMBER 22, 2015 (PHOTOS 1 – 6)



*Photo 1 – View of exposed well casing No. 2*



*Photo 2 – Workers positioning extension pipe onto existing well casing No. 2.*

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Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---



*Photo 3 – View of work site at well casing No. 2.*



*Photo 4 – Worker welding extension pipe onto existing well casing No. 2.*

---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

---



*Photo 5 – View of completed extension pipe connection to existing casing.*



*Photo 6 – View of completed well casing No. 2 prior to installation of pressure gauge and lockable outlet valve.*



---

Department of Environment & Conservation  
Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing  
Shoal Point, NL

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**NOVEMBER 23, 2015 (PHOTOS 1 – 3)**



*Photo 1 – Excavator cleaning up and demobilizing from site.*



*Photo 2 – View of reclaimed bog laydown area near work site.*

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**Department of Environment & Conservation**  
**Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing**  
**Shoal Point, NL**

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*Photo 3 – View of extended well casing Nos. 1 & 2 at end of project.*

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# Appendix E – Daily Construction Reports



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## Amec Foster Wheeler Daily Site Report

### Department of Environment and Conservation

#### Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing, Shoal Point, NL, ENVC SP 2015 - 1

Monday, November 16, 2015

Amec Foster Wheeler Job Number TF1512740.3000

---

## 1.0 Health, Safety and Security

- The initial kick off H&S meeting was held at Boyd and Bungay Construction (B&B) repair garage on Queen Street in Stephenville at 7 AM.
- All of the different activities to be performed on the job were gone over using the Site Specific H&S Plan.
- General topics were:
  - Introduction
  - The Project
  - Schedule
  - Overall H&S
  - Safe Job Procedures
  - Environmental Protection Plan (EPP)
  - Security – General Public Restricted Access
  - Communications
  - Media

## 2.0 Environment

- Temperature ranges from -1 to +1 in snow flurries with sunny breaks.

## 3.0 Site Schedule/Progress – Milestones

- Mobilization of gear and supplies to lay down area near the tip of Shoal Point

## 4.0 Operations Summary

- Pickup Trucks/Autos
  - Client – 0
  - Amec Foster Wheeler – 1
  - B&B - 3
- Materials
  - Small Sand Bags – about 450

- Anchors – about 20
- Silt Fence – 0
- Turbidity Curtain – 61 m
- Fish Tubs - 4
- Equipment
  - Cat 320 Excavator
  - Cat 390H Wheel Loader
  - Tandem Dump Truck –1 delivered rock fill
  - Float – 25 ton tag a long
  - Sea Can
  - Quad – 1
  - ATV Side by Side – 1
  - Rock Truck – Terex 26 ton
  - Service Truck – 1 ton
- Personnel on Site (keeping track of pay items on separate spread sheet)
  - Client
  - Amec Foster Wheeler
    - Construction Manager – Cal Miles
  - Visitors
  - Subcontractors
  - Contractor
    - Chris Young
    - Labour - 3

Work today comprised:

- Mobilization of gear and supplies to the lay down area.

## 5.0 Support Services

- None.

## 6.0 Issues and Concerns

- None.

## **7.0 Additional Comments**

- Outside Events/Community
  - None to report.

## **8.0 Tuesday, November 17 Planned Activities**

- Continue mobilization to the lay down area and down the beach to the site.
- Lay out site and prepare for the repair.

Prepared By: Amec Foster Wheeler - Cal Miles

Distribution:

Client: Troy Duffy

Amec Foster Wheeler: Rod Winsor, Mike Spencer

---

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## Amec Foster Wheeler Daily Site Report

### Department of Environment and Conservation

#### Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing, Shoal Point, NL, ENVC SP 2015 - 1

Tuesday, November 17, 2015

Amec Foster Wheeler Job Number TF1512740.3000

---

## 1.0 Health, Safety and Security

- Tailgate at 6:30 AM
- No incidents or concerns to report

## 2.0 Environment

- Temperatures range from -1 to +1 in snow flurries with occasional sunny breaks. Wind NNE brisk.
- No leaks or spills.
- Lots of sea birds in the area. Lots of snow buntings as well.

## 3.0 Site Schedule/Progress – Milestones

- Mobilization of gear and supplies to lay down area near the tip of Shoal Point.
- About ½ of the specified gear moved to the site.

## 4.0 Operations Summary

- Pickup Trucks/Autos
  - Client – 0
  - Amec Foster Wheeler – 1
  - B&B – 3
  - B&B – 1 later in day
- Materials
  - Small Sand Bags – about 450 (at laydown area)
  - Anchors – about 20 9at site)
  - Silt Fence – 0
  - Turbidity Curtain – 61 m (at site)
  - Fish Tubs – 4 (at site)
- Equipment
  - Cat 320 Excavator (at site)

- Cat 390H Wheel Loader (at laydown)
- Sea Can (at laydown )
- Quad – 1
- ATV Side by Side – 1
- Rock Truck – Terex 26 ton
- Service Truck – 1 ton
- Personnel on Site (keeping track of pay items on separate spread sheet)
  - Client - 0
  - Amec Foster Wheeler
    - Construction Manager – Cal Miles
  - Visitors
  - Contractor
    - Chris Young
    - Labour – 3
    - Engineer – 1 (part time)

Work today comprised:

- Mobilization of gear and supplies to the lay down area.
- Mobilization of gear to site.
- Layout of site.
- Install various safety and restriction signs.
- Install snow fence around the site work area.
- Locate seep and mark with 2x4 stake.
- Remove old wharf piles.

## 5.0 Support Services

- None.

## 6.0 Issues and Concerns

- High winds and snow causing some delay.
- Window of opportunity to get around the point is small when the wind is from the NNW.
- No sign of culvert yet. Was supposed to be delivered today. Contractor assures me that it is on the way.

- Higher elevations at the high water mark on the beach immediately north and east of the site underlain with a minimum of 1.2 m (length of probe) of sand over apparent bog. The ½ inch probe was easy to push by hand.
- Access along beach was generally good; however, at the point of land there is very soft shale bedrock which can be excavated similar to clay soil and may become problematic with multiple passes of the equipment.

## 7.0 Additional Comments

- Outside Events/Community
  - None to report.

## 8.0 Wednesday, November 18 Planned Activities

- Continue mobilization to the site.
- Install turbidity barrier.
- Install oil boom.
- Prepare site for the culvert.
- Better define well casing.
- Install culvert.
- Contractor has brought in 2 tandem loads of large gravel and cobbles to the lay down area. Most likely we will need this for additional support in the softer boggy areas.

Prepared By: Amec Foster Wheeler - Cal Miles

Distribution:

Client: Troy Duffy

Amec Foster Wheeler: Rod Winsor, Mike Spencer

---

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## Amec Foster Wheeler Daily Site Report

### Department of Environment and Conservation

#### Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing, Shoal Point, NL, ENVC SP 2015 - 1

Wednesday, November 18, 2015

Amec Foster Wheeler Job Number TF1512740.3000

---

## 1.0 Health, Safety and Security

- Tailgate at 7:00 AM
- No incidents or concerns to report

## 2.0 Environment

- Temperature ranges from -1 to +1 in snow flurries with occasional sunny breaks. Wind NNE brisk.
- No leaks or spills.

## 3.0 Site Schedule/Progress – Milestones

- Mobilization of last of the gear and supplies to lay down area near the tip of Shoal Point.
- Most of the specified gear moved to the site.

## 4.0 Operations Summary

- Pickup Trucks/Autos
  - Client – 1
  - Amec Foster Wheeler – 1
  - B&B – 3
- Materials
  - Small Sand Bags – about 450 at site
  - Anchors – about 20 (at site) (10 used)
  - Silt Fence – 0
- Equipment
  - Cat 320 Excavator (at site)
  - Cat 390H Wheel Loader (at laydown)
  - Sea Can (at laydown )
  - Quad – 1
  - ATV Side by Side – 1

- Rock Truck – Terex 26 ton
- Service Truck – 1 ton
- Personnel on Site (keeping track of pay items on separate spread sheet)
  - Client – 1 Troy Duffy part time
  - Amec Foster Wheeler
    - Construction Manager – Cal Miles
  - Visitors
  - Contractor
    - Chris Young
    - Labour – 3
    - Engineer – 1 (part time)

Work today comprised:

- Mobilization of remaining gear and supplies to the lay down area.
- Mobilization of gear to site.
- Dug two test pits to determine the general stratigraphy in the area.
- Installed turbidity curtain.
- Installed oil booms.
- Removed boulders and generally leveled the culvert placement area.
- Better pin pointed the seep using steel rod and observing rising bubbles.
- Culvert arrived and was delivered to the site; however, the incoming tide prohibited installation.

## 5.0 Support Services

- None.

## 6.0 Issues and Concerns

- High winds and snow squalls causing some delay.
- Window of opportunity to get around the point is small when the wind is from the NNW.
- Access along beach was generally good, however, some sinking of the 26 ton truck where water was flowing over the beach.

---

## 7.0 Additional Comments

- Outside Events/Community
  - Two bird hunters came down the beach; however, turned around when they saw our signs.

## 8.0 Thursday, November 19 Planned Activities

- Install silt fence in wet areas of the haul road on the beach.
- Install culvert.
- Proceed with repairs.

Prepared By: Amec Foster Wheeler - Cal Miles

Distribution:

Client: Troy Duffy

Amec Foster Wheeler: Rod Winsor, Mike Spencer

---

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## Amec Foster Wheeler Daily Site Report

### Department of Environment and Conservation

#### Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing, Shoal Point, NL, ENVC SP 2015 - 1

Thursday, November 19, 2015

Amec Foster Wheeler Job Number TF1512740.3000

---

## 1.0 Health, Safety and Security

- Tailgate at 7:00 AM
- Testing of sniffer over gas tank, in exhaust and by breath showed that it was working fine.
- Used sniffer continuously while working in the culvert. Results showed that most values were either non detect or well below the limits and alarms. Alarms only went off if probe was placed inside the uncovered casing.
- No incidents or concerns to report

## 2.0 Environment

- Temperature ranges from -1 to +1 clear and sunny in morning then cloudy in afternoon. Wind S light.
- No leaks or spills.

## 3.0 Site Schedule/Progress – Milestones

- Installed culvert.
- Uncovered old casing.

## 4.0 Operations Summary

- Pickup Trucks/Autos
  - Client – 1
  - Amec Foster Wheeler – 1
  - B&B – 3
- Materials
  - Small Sand Bags – about 450 at site
  - Anchors – about 20 (at site) (10 used)
  - Silt Fence – 60
- Equipment
  - Cat 320 Excavator (at site)

- Cat 390H Wheel Loader (at laydown)
- Sea Can (at laydown )
- Quad – 1
- ATV Side by Side – 1
- Rock Truck – Terex 26 ton
- Service Truck – 1 ton
- Personnel on Site (keeping track of pay items on separate spread sheet)
  - Client – 1 (Troy Duffy part time)
  - Amec Foster Wheeler
    - Construction Manager – Cal Miles
  - Visitors
  - Contractor
    - Chris Young
    - Labour – 3
    - Engineer – 1 (part time)

Work today comprised:

- Installation of culvert.
- Uncovered old casing. It was in good shape with no noticeable corrosion.
- Planning for installation of the Dresser coupler and other hardware.

## 5.0 Support Services

- None.

## 6.0 Issues and Concerns

- None to report.

## 7.0 Additional Comments

- Outside Events/Community
  - Two men walked down across the bog to see what was happening.

## 8.0 Friday, November 20 Planned Activities

- Proceed with repairs.

- Backfill with concrete. I have asked the contractor to order an extra  $\frac{1}{2}$  m<sup>3</sup> to accommodate the deep sump we have made. I also asked him to order low slump concrete that we may be able to contour the top into a conical shape without forms.

Prepared By: Amec Foster Wheeler - Cal Miles

Distribution:

Client: Troy Duffy

Amec Foster Wheeler: Rod Winsor, Mike Spencer

---



Uncovered Well Casing at about 12:30 PM.

A 2" Diameter pipe was lodged in the 6" casing. It was about 10' long and was removed by hand. A portion of the pipe broke off and remains in the casing. Probing with a steel bar showed that the casing was filled with apparent sand and gravel.





Cleaning Debris Out of Casing – Note PID Extension Hose in the Background

The original drilling mud and cuttings were visible immediate adjacent to the casing. The men are standing on broken shale bedrock.





Placing of Sand Bags Around Culvert at Low Tide About 10 AM

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## Amec Foster Wheeler Daily Site Report

### Department of Environment and Conservation

#### Investigation and Mitigation of Leaking Abandoned Underground Oil Well Casing, Shoal Point, NL, ENVC SP 2015 - 1

Friday, November 20, 2015

Amec Foster Wheeler Job Number TF1512740.3000

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## 1.0 Health, Safety and Security

- Tailgate at 7:30 AM
- Nothing to report.

## 2.0 Environment

- Temperature ranges from -1 to +3 clear and sunny all day. Wind SW light.
- No leaks or spills.

## 3.0 Site Schedule/Progress – Milestones

- Installed Dresser coupling and riser pipe.
- Poured concrete and removed culvert.

## 4.0 Operations Summary

- Pickup Trucks/Autos
  - Client – 0
  - Amec Foster Wheeler – 1
  - B&B – 3
- Materials
  - 150 mm Dresser coupling - 1.
  - 35 MPa concrete - 3 m<sup>3</sup>.
- Equipment
  - Cat 320 Excavator (at site)
  - Cat 390H Wheel Loader (at laydown and site)
  - Sea Can (at laydown )
  - Quad – 1
  - ATV Side by Side – 1
  - Rock Truck – Terex 26 ton

- Service Truck – 1 ton
- Personnel on Site (keeping track of pay items on separate spread sheet)
  - Client – 0
  - Amec Foster Wheeler
    - Construction Manager – Cal Miles
  - Visitors
  - Contractor
    - Chris Young
    - Labour – 3
    - Engineer – 1 (part time)

Work today comprised:

- Finished preparation of existing casing and coupling.
- Made approximately ½ turn of the coupling on the casing using a chain wrench with 1.2 m long handle and two burly men.
- Installation of the Dresser coupler and other hardware.
- Cleaned area around the pipe down into shale bedrock.
- Poured concrete.
- Removed culvert.

## 5.0 Support Services

- Concrete supplier and borrowed 2 pipe trust clamps from the Town of Stephenville.

## 6.0 Issues and Concerns

- Beach access is becoming somewhat difficult with the wheeled vehicles becoming stuck especially near high tide. Both wheel loader and articulated rock truck became stuck. Although they were pulled out by the excavator, it was decided to leave them on the beach above high tide overnight.
- We experienced, both yesterday and today, that the tide seems to rise at a faster rate when about ½ way in. Both days we had to scramble to get our tools and pump above the rising water.

## 7.0 Additional Comments

- While digging out the soil and shale bedrock surrounding the casing we disturbed pockets of oil. We let the water flood these areas; however, we did not see any additional oil or bubbles rising similar to that inside the casing.
- Outside Events/Community
  - Two gentlemen came down the beach on an ATV and generally inquired about the work.

## 8.0 Saturday, November 21 Planned Activities

- Remove sand bags and soil from repaired casing area.
- Remove contaminated soil from site (contractor is supplying dumpster type bins at the laydown to accommodate this soil).
- Move all gear south to Well #2 and commence with installation of riser pipe.

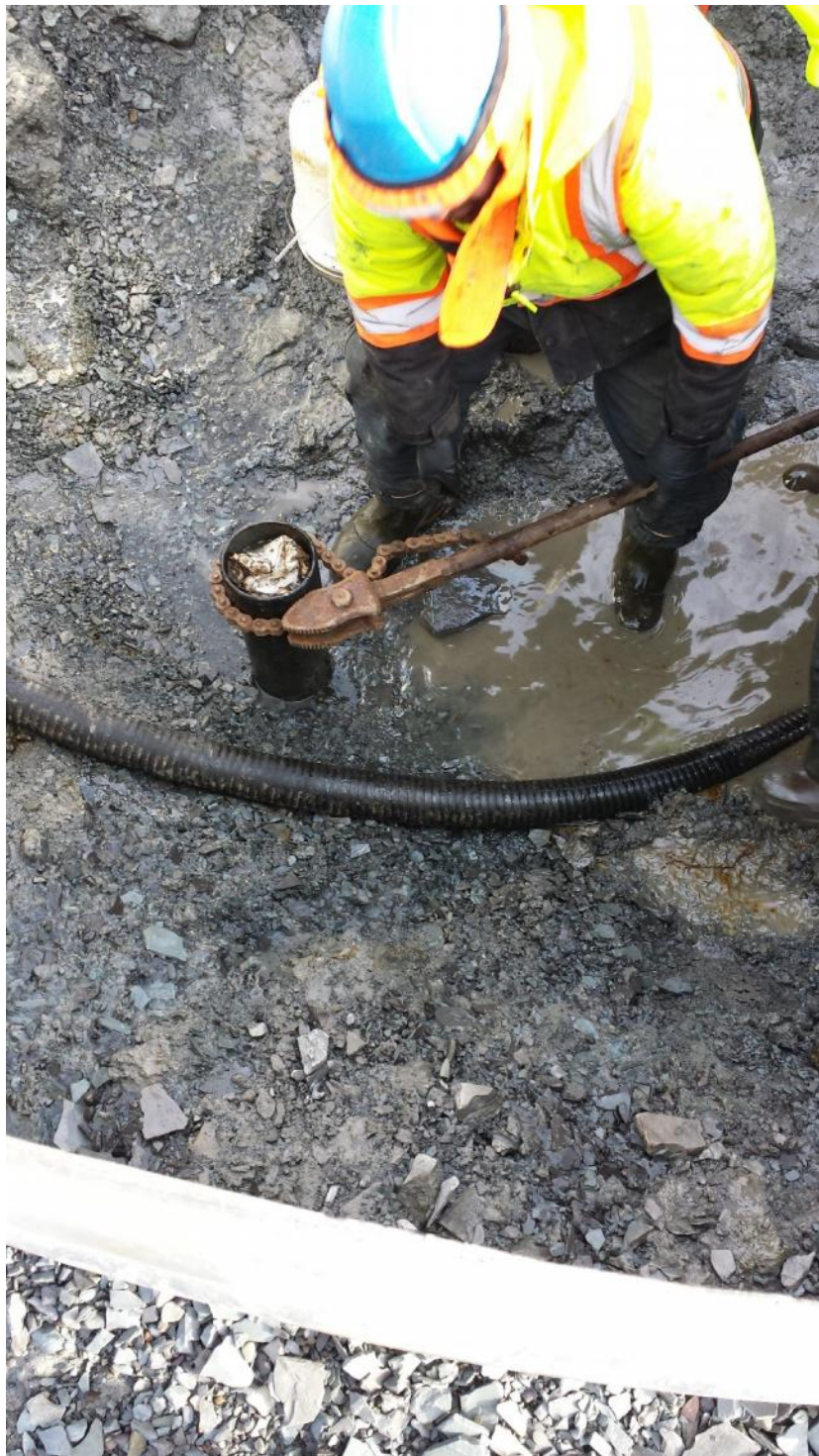
Prepared By: Amec Foster Wheeler - Cal Miles

Distribution:

Client: Troy Duffy

Amec Foster Wheeler: Rod Winsor, Mike Spencer

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Tightening Coupling on Casing ~1/2 Turn





Dresser Coupling and Riser (workers had just cleaned the soil and loose bedrock down to solid bedrock. Note the oil on the water and oozing out from pockets in the rock).

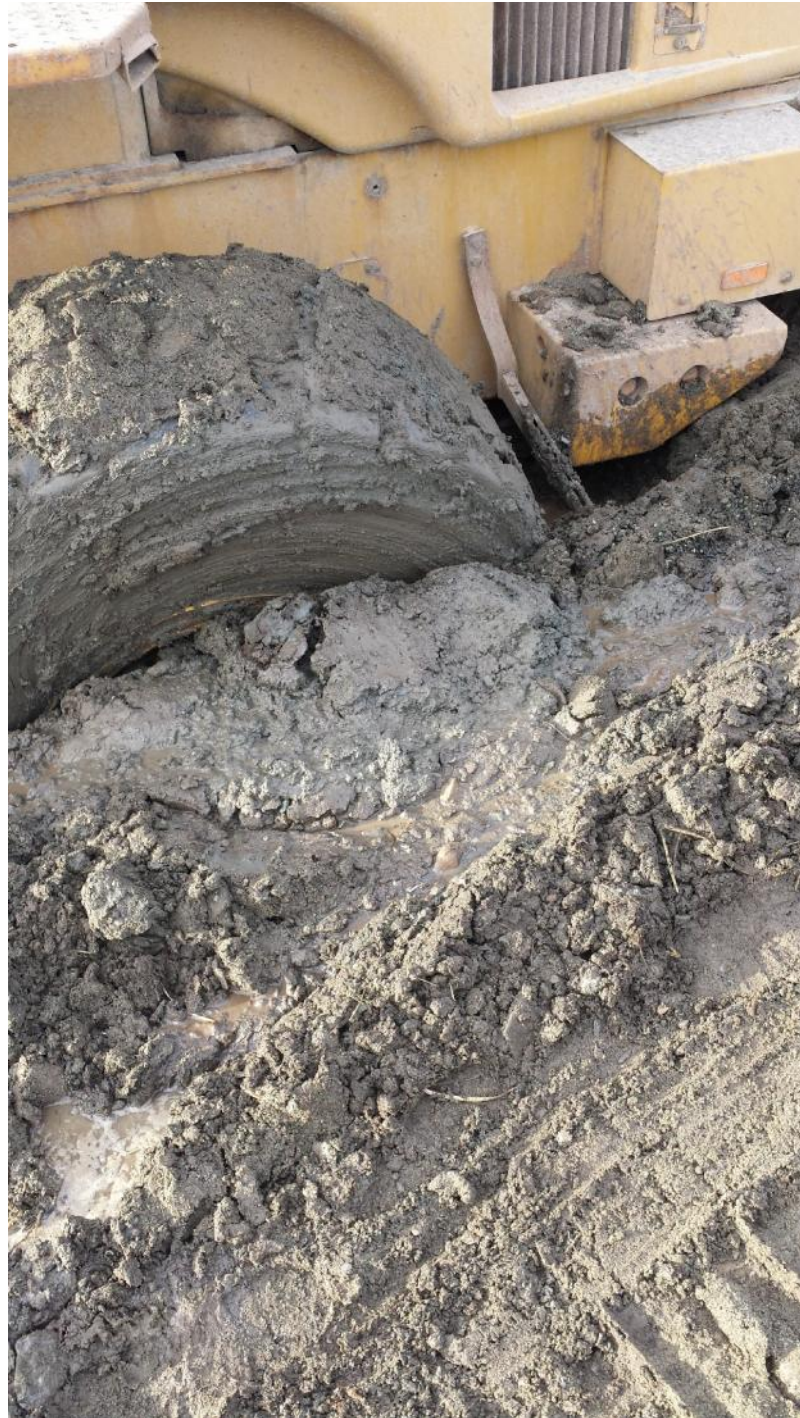


35 MPa concrete placed





Riser in Place and Culvert Removed



Soft Beach Conditions

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Saturday, November 21, 2015

Amec Foster Wheeler Job Number TF1512740.3000

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## 1.0 Health, Safety and Security

- Tailgate at 8:30 AM
- Nothing to report.

## 2.0 Environment

- Temperature ranges from +1 to +6 cloudy all day. Wind SW light.
- No leaks or spills.
- As tide was coming in, small sheens were visible along the shoreline outside our oil booms. Similar sheens were observed last July during the site reconnaissance.

## 3.0 Site Schedule/Progress – Milestones

- Finished installation of the flange and kit on top of the riser.
- Partial mobilization to Well #2

## 4.0 Operations Summary

- Pickup Trucks/Autos
  - Client – 0
  - Amec Foster Wheeler – 1
  - B&B – 3
- Materials
  - All Fittings for 150 mm setup.
- Equipment
  - Cat 320 Excavator (at site)
  - Cat 390H Wheel Loader (at laydown and site)
  - Sea Can (at laydown )
  - Quad – 1
  - ATV Side by Side – 1
  - Rock Truck – Terex 26 ton

- Service Truck – 1 ton
- Personnel on Site (keeping track of pay items on separate spread sheet)
  - Client – 0
  - Amec Foster Wheeler
    - Construction Manager – Cal Miles
  - Visitors
  - Contractor
    - Chris Young
    - Boyd
    - Labour – 3
    - Engineer – 1 (part time)

Work today comprised:

- Finished installation of top flange and fittings.
- Removed about 60 tons of contaminated soil, including sand bags and plastic from site and sent to facility in Stephenville.
- Moved outer boom to new location.
- Left inner oil boom at first site overnight to collect residual oil from beach as the tide rises.

## 5.0 Support Services

- Contaminated soil site in Stephenville.

## 6.0 Issues and Concerns

- Beach access just north of the site is difficult with the wheeled vehicles becoming stuck especially near high tide. Both wheel loader and articulated rock truck (eight times) became stuck.

## 7.0 Additional Comments

- Outside Events/Community
  - None to report.

## 8.0 Sunday, November 22 Planned Activities

- Complete mobilization to Well #2.
- Install culvert and dig out casing.
- May have time to weld on riser late in the day.



Prepared By: Amec Foster Wheeler - Cal Miles

Distribution:

Client: Troy Duffy

Amec Foster Wheeler: Rod Winsor, Mike Spencer

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Final Installation of Flange and Fittings



Contaminated Soil that was sent to the Remediation Center





Oil contaminated soil in place near Remediated Well





Well #2 with posts used to stabilize Oil Booms and Turbidity Curtain



## Amec Foster Wheeler Daily Site Report

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Sunday, November 22, 2015

Amec Foster Wheeler Job Number TF1512740.3000

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## 1.0 Health, Safety and Security

- Tailgate at 8:30 AM at B&B shop.
- Completed JSA for welding at Well #2 and went over it with all the crew.

## 2.0 Environment

- Temperature ranges from +1 to +6 cloudy and rain all day. Wind SW strong, whitecaps on West Bay.
- No leaks or spills.
- A harbour seal swam by and sized us up.

## 3.0 Site Schedule/Progress – Milestones

- Finished installation of Well #2.
- 20% demobilization to the laydown area.

## 4.0 Operations Summary

- Pickup Trucks/Autos
  - Client – 1
  - Amec Foster Wheeler – 1
  - B&B – 3
- Materials
  - We used the 200 mm flange for the riser. Trimmed off excess material and welded to riser pipe.
- Equipment
  - Cat 320 Excavator (at site)
  - Cat 390H Wheel Loader (at laydown)
  - Sea Can (at laydown )
  - Quad – 1
  - ATV Side by Side – 1

- Rock Truck – Terex 26 ton
- Service Truck – 1 ton
- Personnel on Site (keeping track of pay items on separate spread sheet)
  - Client – 1
  - Amec Foster Wheeler
    - Construction Manager – Cal Miles
  - Visitors
  - Contractor
    - Chris Young
    - Boyd
    - Labour – 3
    - Engineer – 0

Work today comprised:

- Finished installation at Well #2. Contractor will install fittings at a later date.
- Partial demobilization to the laydown area.

## 5.0 Support Services

- None.

## 6.0 Issues and Concerns

- Beach access just north of the site is difficult with the wheeled vehicles becoming stuck especially near high tide. Articulated rock truck and ATV became stuck.

## 7.0 Additional Comments

- Well #2 was exposed and dug out about 1 PM. There were only traces of petroleum hydrocarbons in the excavated soil. In fact most people at the site could not smell it (at site 1 the odor was strong when we first opened up the ground). Hitting the casing with a hammer did bring a few drops of oil along with a couple of bubbles to the surface of the water. All visible oil was recovered using oil absorbent pads.
- Due to compound bending in the existing casing, it required cutting about 0.6 m down from the top or about 0.4 m under the ground surface. The pipe wall thickness was visually estimated to be about 3/8".
- The gas sniffer did not register either in the open excavation or in the casing.
- The laborers were able to push a stick about 1.5 m down inside the inner casing with no obstructions met.

- We had to bring the articulated truck back out to the site to deliver the welder. It was difficult going.
- When we were placing the new riser on the existing casing we found that the new could slide down over the existing and fit snugly. It appears that the old pipe is 6" OD while the new is 6" ID. We held it at 125 mm overlap due to restricted working space and welded at that location. Five reinforcement straps were used instead of the four specified (we had the material at hand). With this we felt that we had a significantly stronger connection than at the first well. No concrete was available on Sunday. With this in mind along with the poor condition of our beach road and pending forecast strong winds NW for later Monday into Tuesday we decided (with consultation with the designer and project manager) that the addition of concrete at this particular site was both not needed nor practical at this time.
- At the first well we had the valve closed overnight. There was no discernable reading on the gauge; however, when we opened it, a small hiss of escaping gas could be heard. We placed the gas detector tube in through the valve and got a PID reading of 111 and LEL of 27. CO did not register.
- Since repairing the first site I have examined, on two occasions, the water surrounding the first riser for bubbles. None were visible.
- There are still small visible sheens on the water as the tide moves in. Even though we removed about 60 tons of contaminated soil from around the riser and adjacent beach we did not get it all. Exposed soil pushed up from the travels of the articulated truck near the well shows that the top of the glacial marine till is stained with oil. The removal of this oil is beyond the scope of this present effort.
- Both wells were artesian. The flow rates were not determined.
- Outside Events/Community
  - None to report.

## 8.0 Monday, November 23 Planned Activities

- Complete demobilization

Prepared By: AMEC Foster Wheeler - Cal Miles

Distribution:

Client: Troy Duffy

AMEC Foster Wheeler: Rod Winsor, Mike Spencer

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Modified 200 mm flange welded to Well #2 Riser



New 6" ID riser pipe welded onto old 6" OD casing (5" overlap)



At end of Well #2 repair, the Turbidity Curtain was left in overnight to allow for settlement





Welded on strap



Work setup and lowering new riser