NOVA SCOTIA POWER
An Emera Company

August 30, 2010

Nancy McNeil
Clerk of the Board
Nova Scotia Utility and Review Board
1601 Lower Water Street, 3rd Floor
P.O. Box 1692, Unit "M"
Halifax, NS B3J 3S3

Re: CI# 33942 - Coon Pond Pipeline Replacement - NSPI - Responses to Third Set of Information Requests (IRs) - P – 510

Dear Ms. McNeil:

Enclosed are the IR responses pertaining to the capital item referenced above.

These IRs were received on August 13, 2010.

Regards,

Lee Thomson-Lutz MBA, CMA
Manager Capital,

Encl.

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Request IR-10:

In its response to IR-6 it is stated: NSPI had to reevaluate the design of the pipeline, due to a blowout in the woodstave pipe in 2008. This caused a delay in the spending of this project".

(a) Please explain why the proper evaluation of the design had not been done before requesting Board approval for this project on November 25, 2008?

(b) It appears that the referenced reevaluation took a year to complete. Please clarify why the reevaluation had not been completed earlier in 2009 and Board approval for overspending requested in 2009?

Response IR-10:

(a) Under normal circumstances, a detailed engineering evaluation would have been completed prior to requesting Board approval of a capital application. NSPI filed this U&U prior to completing the verification of the band spacing due to a blowout in June 2008. This blowout was extensive and filing this item prior to incurring any costs for completing repairs was a priority.

(b) The reevaluation took approximately six months to complete. This task was completed by May 2009. Board approval for overspending was not requested in 2009 because NSPI determined the best option was to re-forecast this item in a planned manner as part of the 2010 ACE Plan. The reforecasting of this item was aligned with the coordination and completion of NSPI's 2010 ACE Plan.

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Request IR-11:

As a part of its response to IR-9 NSPI provided copies of inspection fundings from 1998 and 2008. Could you please provide the following clarifications:

(a) Based on previously provided information, it is the Board staff understanding that the pipeline was also inspected in 2007. If this is correct, provide a summary of the inspection findings.

(b) In its response to IR-1 NSPI stated that the project to replace the lower 700 feet of this pipeline had been completed. Please advise on the date when the woodstave pipeline was watered up after this partial pipeline replacement, and the date when it was dewatered, following the blow-out in 2008 referenced above.

(c) Please provide a timeline of events that followed the blowouts in the lower section of the pipeline in 2006, clearly identifying periods when the pipeline was used for power generation.

Response IR-11:

(a) In 2007, NSPI took wood samples from the staves at various stations along the pipe. Please see Attachment 1.

(b) The Coon Pond pipeline was watered up after the partial pipeline replacement on Feb 19, 2008. The pipeline was dewatered following the blowout on June 16, 2008.

(c) Below is the timeline of events that followed the blowouts in the lower section of the pipeline in 2006.

Response IR-11: (cont'd)

2006

- July 16: Blowout occurred.
- July 17-31: The pipe was repaired and watered up.
- August 1-20: Generating. NSPI identified other areas that required repairs.
- August 20: NSPI drained the head pond and repaired the marked areas.
- August 26: Pipe watered up.
- August 27: Blowout occurred.
- August 28: Patched blowout area.
- August 29: Refilled pipe. Generating.
- August 31: Blowout occurred. Pipe drained
- September 1 -7: Pipe repaired and watered up.
- September 7 – Dec 31: Generating. A leak developed which was monitored by NSPI.

2007

- January 1 to February 13: Generating. The leak continued to be monitored.
- February 14: Due to the increased severity of this leak, the decision was made to shut down the unit and drain the pipe. The pipe remained dewatered until the replacement of the lower 700 ft section of the pipe was completed.
- June 18-21: NSPI took samples of the woodstave core.
- November12: Work began to replace the lower 700' section of pipe and this work was completed on February 19, 2008 under CI#28863.

2008

- Feb 19: Replacement of the lower 700 ft section of the pipe completed. The pipe was watered up and began generating.

Response IR-11: (cont'd)

- February 20 – June 16: Generating
- June 16: Blowout occurred in the upper section of the woodstave pipe and it was dewatered. The pipe remained out of service to Dec. 31.
- June 24-25: Canbar inspected the pipe.
- June 26-August 31: NSPI completed a preliminary assessment to repair the pipe and return it to service.
- September / October: Preparation of the U&U application.
- November 25: U & U application CI# 33942 filed with the Board.
- December: NSPI started the detailed review of the band spacing.

<u>2009</u>

- Pipeline out of service in 2009 (Jan 1 to Dec 31 inclusive).
- January to May: Detailed review of band spacing requirements and engineering completed.
- June to December: Decision was made by NSPI to complete this project in 2010 in a planned manner as part of ACE 2010.
- December: 2010 ACE Plan filed with the UARB. The revised forecast for this project was included in ACE 2010 as a carryover item.

<u>2010</u>

- January to March: Materials were ordered and delivered to the site.
- March 29 to June 18: Replacement of the upper section of the pipe.
- June 19: Construction completed. Dam is ready for generation when there is sufficient level in the head pond.

Coon Pond Pipeline
Woodstave Cores (Collected June 18, 2007)
June 21, 2007.

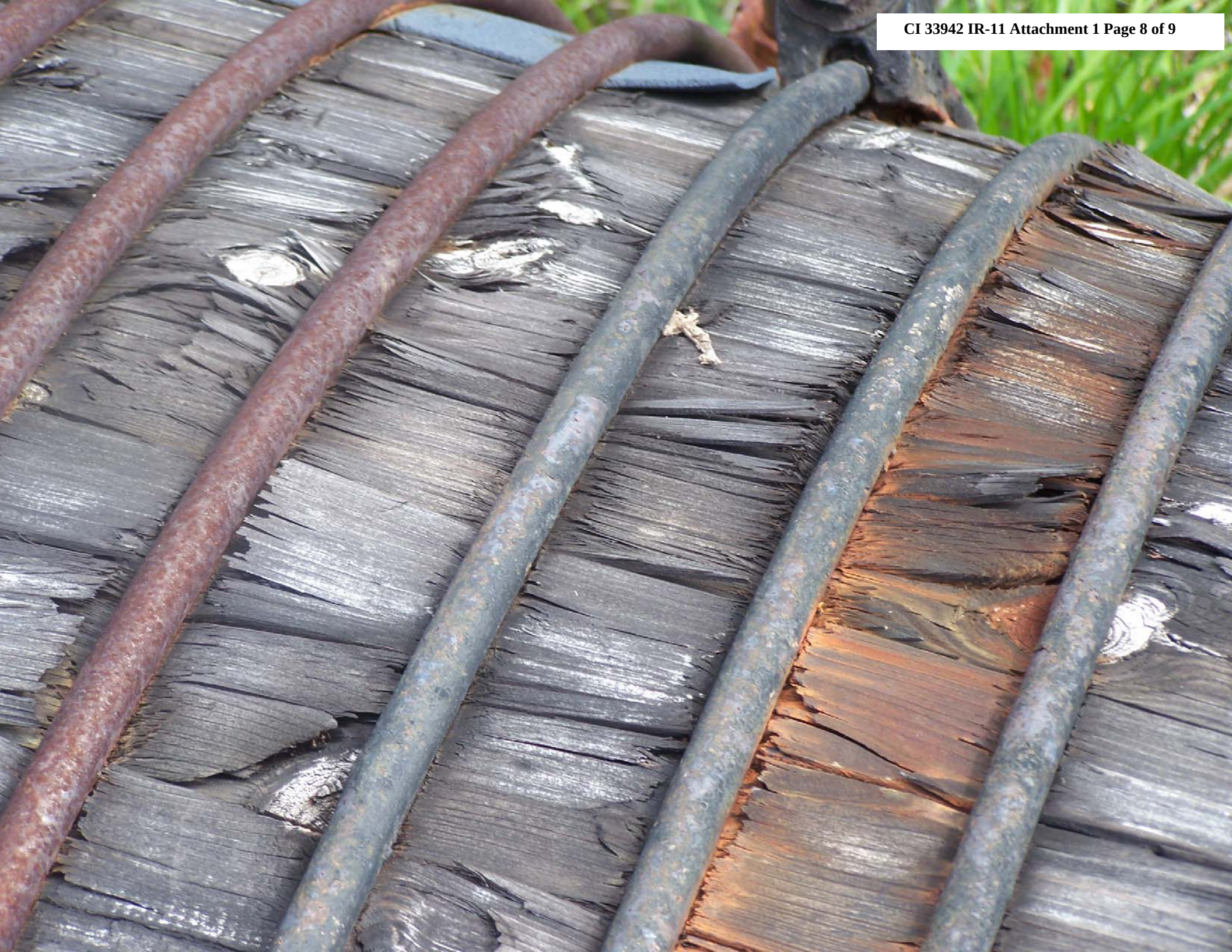
Station	Observation	Station	Observation	Station	Observation	Station	Observation
0+10	satisfactory, core sample relatively intact, hard	10+00	Good to Fair - some wood grain delamination visible	20+00	Poor to Fair - some delamination, discoloured	30+00	Very Poor - cores fragmented, discoloured
0+50	satisfactory, core sample relatively intact, mild	**10+50**	Good to Fair - some wood grain delamination visible	**20+50**	Poor to Fair - some delamination, discoloured	**30+50**	Very Poor - cores fragmented, discoloured
1+00	satisfactory, core sample relatively intact, hard	11+00	Good to Fair - some wood grain delamination visible	21+00	Poor to Fair - some delamination, discoloured	31+00	Very Poor - cores fragmented, discoloured
1+50	satisfactory, core sample relatively intact, hard	**11+50**	Good to Fair - some wood grain delamination visible	**21+50**	Poor to Fair - some delamination, discoloured	**31+50**	Very Poor - cores fragmented, discoloured
2+00	satisfactory, core sample relatively intact, hard	12+00	Fair - moderate wood grain delamination present	22+00	Poor to Fair - some delamination, discoloured	32+00	Extremely Poor - difficult to retrieve intact cores
2+50	satisfactory, core sample relatively intact, hard	**12+50**	Fair - moderate wood grain delamination present	**22+50**	Poor to Fair - some delamination, discoloured	**32+50**	Extremely Poor - difficult to retrieve intact cores
3+00	satisfactory, core sample relatively intact, hard	13+00	Fair - moderate wood grain delamination present	23+00	Poor to Fair - some delamination, discoloured	33+00 (surge tank)	Extremely Poor - difficult to retrieve intact cores
3+50	satisfactory, core sample relatively intact, hard	**13+50**	Fair - moderate wood grain delamination present	**23+50**	Poor to Fair - some delamination, discoloured		
4+00	satisfactory, core sample relatively intact, hard	14+00	Fair - moderate wood grain delamination present	24+00	Poor to Fair - some delamination, discoloured		
4+50	satisfactory, core sample relatively intact, hard	**14+50**	Good to Fair - some wood grain delamination visible	**24+50**	Poor to Fair - some delamination, discoloured		
5+00	satisfactory, core sample relatively intact, hard	15+00	Good to Fair - some wood grain delamination visible	25+00	Poor to Fair - some delamination, discoloured		
5+50	Good to Fair - some wood grain delamination visible	**15+50**	Fair - moderate wood grain delamination present	**25+50**	Poor to Fair - some delamination, discoloured		
6+00	Good to Fair - some wood grain delamination visible	16+00	Fair - moderate wood grain delamination present	26+00	Poor to Fair - some delamination, discoloured		
6+50	satisfactory, core sample relatively intact, hard	**16+50**	Fair - moderate wood grain delamination present	**26+50**	Poor to Fair - some delamination, discoloured		
7+00	satisfactory, core sample relatively intact, hard	17+00	Fair - moderate wood grain delamination present	27+00	Fair - moderate wood grain delamination present		
7+50	satisfactory, core sample relatively intact, hard	**17+50**	Fair - moderate wood grain delamination present	**27+50**	Fair - moderate wood grain delamination present		
8+00	satisfactory, core sample relatively intact, hard	18+00	Fair - moderate wood grain delamination present	28+00	Very Poor - cores fragmented, discoloured		
8+50	Good to Fair - some wood grain delamination visible	**18+50**	Fair - moderate wood grain delamination present	**28+50**	Very Poor - cores fragmented, discoloured		
9+00	Good to Fair - some wood grain delamination visible	19+00	Fair - moderate wood grain delamination present	29+00	Very Poor - cores fragmented, discoloured		
9+50	Good to Fair - some wood grain delamination visible	**19+50**	Fair - moderate wood grain delamination present	**29+50**	Very Poor - cores fragmented, discoloured		

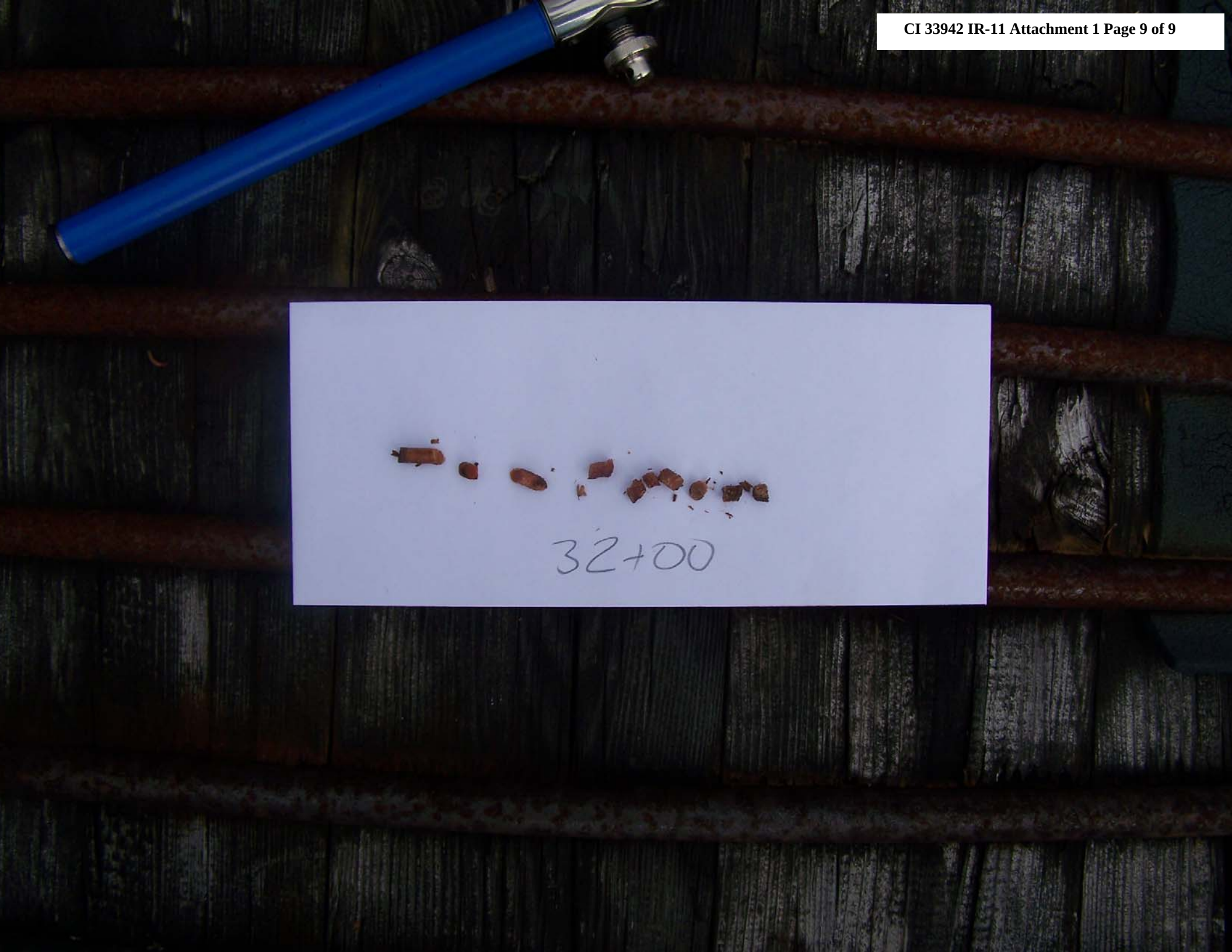
Notes: 1.) Where cores are fragmented individual wood grains have separated into sheets. This condition very severely compromises the structural integrity of wood staves in those locations. In the worst cases, the retrieved delaminated circular core samples closely resemble confetti.
2.) Most core samples showed varying degrees of discoloration. However, severely discoloured core samples (as found from chainage 20+00) suggest the presence of mildrew and rot within the wood strata.
3.) As chainage increases, so does pipeline pressure. Observations indicate that the weakest staves are found where pipeline pressure is greatest.
4.) Existing wood staves are fabricated from Red Pine, a readily available and inexpensive local species of wood not known for resistence to rot and related degradation. Preservative treated Douglas Fir, Hemlock and Cedar are preferred wood species for this sort of application.
5.) Condition transformation from Fair to Very Poor at about chainage 27+50 is sudden and quite remarkable. Wood staves from chainage 28+00 to 33+00 do not appear to be fit for service.


0+10


1+00


STANLEY
Long Tape
200'




32+00

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Request IR-12:

In the response to IR-9 (a), referring to a reference from the 1998 Canbar Report, NSPI states: "As a result, the original project submitted to the Board for approval was based on replacing the bands at their existing spacing, and then replacing the entire woodstave pipe in *2017".*

(a) Please identify "the original project".

(b) Does the above statement mean that the scope and cost estimate for the "original project" was based on the inspection performed in 1998? Please clarify.

Response IR-12:

(a) The "original project" refers to the UARB capital application to extend the life of the remaining woodstave pipe by replacing the bands at their existing spacing. This application was filed with the Board on Nov 25, 2008 in the amount of $629,936.

(b) The scope in the original submission was based on both the 1998 Canbar Report and NSPI's woodstave core sampling, which was carried out in 2007. The Canbar report stated that generally the staves were in satisfactory condition. NSPI's wood samples confirmed that the condition of the staves in the upper portion of the pipeline was found to be generally good. Since a woodstave pipe gets most of its strength from the bands, it was determined, at this point in time, that replacing the bands should extend the life of the pipe by approximately 5 years. Any deteriorated staves would also be replaced.

Request IR-13:

The 1998 Canbar Report provided a list of recommendations. Please identify and describe the actions initiated by NSPI in order to follow these recommendations.

Response IR-13:

Recommendation 1

All bands that are disconnected, missing or partially disengaged must be reconnected, replaced or properly seated to ensure that the band system renders the penstock safe with lower likelihood of blowout occurring. In addition, those bands that exhibit significant corrosion, say 10-15% diameter reduction, should be replaced, and those top sections with corroded buttonheads must be replaced or repaired.

NSPI's Actions

In 1999 disconnected bands were reconnected, and corroded bands were replaced.

Recommendation 2

Refurbish or replace those cradles that are deteriorating.

NSPI's Actions

The condition of the cradles was monitored, but no cradles were replaced.

Response IR-13: (cont'd)

Recommendation 3

Manage the leaks with patches, wedges, candlewick, and no band tightening as with present practices.

NSPI's Actions

Pipeline was inspected annually and patches, wedges and candlewick applied as required.

Recommendation 4

Do not drain the pipe unless absolutely necessary as the stave wood no longer has the ability to readily swell and reseal.

NSPI's Actions

There have been several occasions when it was necessary to dewater the pipe.

Recommendation 5

Re-coat the penstock with a wood preservative, preferably creosote, and with rust inhibitor when the pipe is dry on the outside surface. The treatment won't take to the wood well if it is wet, which will be difficult when in operation due to the leaks and porous staves. Schedule to apply in conjuction with a dewatering if possible, otherwise, apply in as best a condition as is possible.

Response IR-13: (cont'd)

NSPI's Actions

The pipeline was re-coated with creosote in 1999.

Recommendation 6

Maintain drainage around the pipe and keep the area under and around the pipe clear of vegetation to provide good air circulation. Excavation is required to maintain adequate air flow where invert-bed clearance is minimal or gone.

In general, this penstock is in fair condition. It should provide several more years service without serious problems so long as banding is maintained in a safe state.

NSPI's Actions

Yearly maintenance was carried out to maintain drainage and clear vegetation from around the pipe.