

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF: *The Public Utilities Act*, R.S.N.S. 1989, c.380,
as amended

- and –

IN THE MATTER OF: An Application by Nova Scotia Power Inc. and
Pacific West Commercial Corporation for
Approval of a Load Retention Rate for a facility
at Port Hawkesbury, Nova Scotia

DIRECT EVIDENCE

OF

J. RICHARD HORNBY
SYNAPSE ENERGY ECONOMICS, INC.

ON BEHALF OF BOARD COUNSEL

June 13, 2012

1 **A. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.**

3 A. My name is J. Richard Hornby. I am a Senior Consultant at Synapse
4 Energy Economics, 485 Massachusetts Avenue, Cambridge, MA 02139.

5 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND**
6 **PROFESSIONAL EXPERIENCE.**

7 A. My educational background and professional experience are detailed in
8 Exhibit JRH-1 of this evidence. In summary, I have a Bachelor of Industrial
9 Engineering from the Technical University of Nova Scotia, now the School
10 of Engineering at Dalhousie University, and a Master of Science in Energy
11 Technology and Policy from the Massachusetts Institute of Technology
12 (MIT). Prior to becoming a regulatory consultant in 1986 I worked on Nova
13 Scotia energy issues for several years, initially as a project engineer and
14 then as a senior civil servant. Since becoming a regulatory consultant I
15 have provided expert testimony and litigation support on a variety of gas
16 and electric industry planning, feasibility and ratemaking issues in
17 approximately 120 proceedings on behalf of a range of clients including
18 utility regulators, consumer advocates, environmental groups, energy
19 marketers, gas producers, and utilities.

20 **Q. HAVE YOU FILED EVIDENCE PREVIOUSLY BEFORE THE BOARD?**

1 A. Yes. I have filed evidence regarding proposed distribution service tariff rates
2 in a 2011 Heritage Gas proceeding, NSUARB-NG-HG-R-11, and a 2001 Sempra
3 proceeding, NSUARB-NG-SEMPRA-SEM-00-08.

4 **Q. WHAT IS THE PURPOSE OF YOUR EVIDENCE IN THIS**
5 **PROCEEDING?**

6 A. Synapse was retained by Board counsel to review the application by Nova
7 Scotia Power Inc. (NSPI) and Pacific West Commercial Corporation
8 (PWCC) for a load retention tariff (LRT) for the former NewPage mill in
9 Port Hawkesbury (NPPH). My evidence presents the results of my review
10 of whether the application will result in just and reasonable rates. Board
11 counsel has retained another consultant to review the tax aspects of the
12 application.

13 **Q. WHAT DATA SOURCES DID YOU RELY UPON TO PREPARE YOUR**
14 **REVIEW OF THE APPLICATION?**

15 A. My review of the application is primarily based on the information NSPI
16 and PWCC presented in their direct evidence and their responses to
17 various information requests.

18 **Q. PLEASE EXPLAIN HOW YOUR EVIDENCE IS ORGANIZED.**

19 A. The remainder of my evidence begins with a summary of conclusions. It
20 then presents my review of NSPI's proposal for determining its
21 incremental cost of supplying the NPPH load under the proposed LRT
22 pricing mechanism. I next discuss NSPI's proposal to exclude incremental

1 renewable energy costs associated with the NPPH load from its
2 calculation of incremental costs under the LRT. The final section of my
3 testimony reviews NSPI's request that it be held harmless from any
4 adverse financial impacts that might result from the proposed LRT.

5 **Q. HAVE YOU FILED EXHIBITS WITH YOUR EVIDENCE?**

6 A. Yes, I have filed the following exhibits with this evidence:

7 JRH-1 Resume of J. Richard Hornby

8 JRH-2 NSPI projection of annual incremental generation to
9 supply NPPH from 2013 to 2022

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12 **B. SUMMARY OF CONCLUSIONS**

13 **Q. PLEASE SUMMARIZE NSPI'S PROPOSAL FOR PRICING ITS SUPPLY**
14 **TO NPPH UNDER THE LRT AND YOUR CONCLUSIONS REGARDING**
15 **THAT PROPOSAL.**

16 A. NSPI is proposing to price its supply to NPPH at NSPI's actual
17 incremental cost of supplying that load in each hour plus a contribution to
18 fixed cost. NSPI maintains that its proposed rate mechanism will prevent
19 its other customers from having to pay for any variable costs of fuel,
20 operating costs or variable capital costs that NSPI incurs as a result of the
21 operation of the mill. My review indicates that NSPI has not provided a
22 detailed description of the method it will use to determine its actual

1 incremental costs, has not provided a numerical illustration of that method
2 and has not proposed a process for periodic audits of its rate calculations
3 by an independent reviewer. My conclusion, based on those findings, is
4 that the revenues from the proposed rate mechanism may be less than
5 NSPI's incremental cost to supply the mill. The rate mechanism would not
6 be just and reasonable if NSPI's other customers would ultimately pay for
7 a portion of the incremental costs. I recommend that NSPI provide a
8 detailed description of the method it will use to determine its actual
9 incremental costs, a numerical illustration of this method and a proposal
10 for independent audits of its calculations on a periodic basis.

11 **Q. PLEASE SUMMARIZE NSPI'S PROPOSAL TO EXCLUDE**
12 **INCREMENTAL RENEWABLE ENERGY COSTS IT INCURS TO**
13 **SUPPLY THE NPPH LOAD FROM THE UNIT INCREMENTAL COST IT**
14 **WILL CHARGE UNDER THE LRT AND YOUR CONCLUSIONS**
15 **REGARDING THAT PROPOSAL.**

16 A. NSPI is proposing to exclude incremental renewable energy costs it incurs
17 to supply the NPPH load from the unit incremental cost it will charge under
18 the LRT. My review indicates those incremental renewable energy costs
19 could be significant and that NSPI may have the ability to avoid some, or
20 all, of them. My conclusion, based on those findings, is that the rate
21 mechanism would not be just and reasonable if NSPI's other customers
22 would have to pay the incremental renewable energy costs NSPI incurs to
23 supply the NPPH load. I recommend that NSPI either avoid incurring

1 incremental renewable energy costs to supply the NPPH load or include
2 those costs as a component of the incremental costs it recovers under the
3 LRT.

4 **Q. PLEASE SUMMARIZE NSPI'S REQUEST TO BE HELD HARMLESS**
5 **FROM ANY ADVERSE FINANCIAL IMPACTS THAT MIGHT RESULT**
6 **FROM THE PROPOSED LRT AND YOUR CONCLUSIONS**
7 **REGARDING THAT PROPOSAL.**

8 A. NSPI has requested that it be held harmless from any future adverse
9 financial impacts that might result from the proposed LRT, in particular any
10 amounts owed to the Canada Revenue Agency (CRA) or any costs of
11 eliminating pre-existing environmental contamination on the mill site. My
12 review indicates that NSPI may be able to avoid or minimize its liability for
13 eliminating pre-existing environmental contamination and that it, and
14 PWCC, have the responsibility and authority to ensure that their
15 Partnership arrangement is designed and implemented in compliance with
16 CRA requirements. My conclusion, based on those findings, is that the
17 NSUARB should not approve NSPI's request to be held harmless from
18 any future adverse financial impacts that may arise from the LRT. If an
19 adverse financial impact does arise from the LRT in the future I
20 recommend that the NSUAB determine the appropriate ratemaking
21 treatment of that impact at that time based on its review of the facts
22 specific to that impact.

23 **C. INCREMENTAL COSTING OF ELECTRICITY USED BY THE MILL**

1 **Overview**

2 **Q. PLEASE PROVIDE AN OVERVIEW OF THE PROPOSAL FOR NPPH.**

3 A. PWCC is proposing to acquire control of NPPH and then form a limited
4 partnership (the “Partnership”) to resume operation of the super
5 calendared paper machine (PM2) at the NPPH mill. PWCC projects the
6 mill will use 1,000,000 MWh per year, which represents approximately
7 10% of NSPI’s projected total annual sales in 2013 per NSPI (Synapse)
8 IR-8. When operating at its maximum load, which could be up to 200 MW
9 according to NSPI (Synapse) IR-15 (b), the mill could represent 15 to 25
10 percent of NSPI’s total system hourly load in the majority of off-peak
11 hours. NSPI would require the output of more than one of its major fossil-
12 fuel units to supply that maximum load since the capacity of most of those
13 units is less than 160 MW.

14 According to the Application, NSPI would be one of the limited
15 partners. NSPI would dedicate the use of certain of its generation facilities,
16 referred to as the DUA1 facilities, to the Partnership. NSPI would receive
17 first preferred dividends as compensation for the energy attributed to the
18 DUA1 facilities. In hours in which the mill requires energy in excess of the
19 energy attributed to the DUA1 facilities, the Partnership would purchase
20 that additional energy from NSPI under the proposed LRT.

21 **Q. PLEASE SUMMARIZE THE INCREMENTAL COSTING PROPOSED**
22 **FOR THE ELECTRICITY NSPI WOULD SUPPLY TO NPPH.**

23 A. The LRT, presented in Appendix E of the PWCC direct evidence, presents
24 the formula the Partnership will use to calculate the compensation to NSPI

1 for all of the electricity it supplies to the mill. According to that formula, the
2 compensation for all supply will be equal to the actual load of the mill in
3 kWh multiplied by NSPI's Hourly Incremental Cost/kWh plus a Variable
4 Capital Cost of 0.117 cents/KWh plus a Contribution to Fixed Cost. The
5 minimum contribution to fixed costs would be 0.20 cents/kWh.

6 **Q. PLEASE SUMMARIZE THE REAL TIME PRICING (RTP) PROTOCOL**
7 **THROUGH WHICH NSPI AND PWCC PROPOSE TO IMPLEMENT THIS**
8 **INCREMENTAL COSTING.**

9 A. The RTP protocol, presented in Appendix J of the PWCC direct evidence,
10 describes the process and format through which NSPI and PWCC
11 propose to implement the incremental costing of electricity supply under
12 the LRT.

13 On a day-ahead basis, i.e., one day in advance of the operational
14 day, the protocol will operate as follows. By 7 a.m., NSPI will provide
15 PWCC a "Day-Ahead Cost Forecast". This will be NSPI's forecast of its
16 cost-quantity (CQ) pairs for each hour of the following day, i.e., the
17 operational day. The CQ pairs are NSPI forecasts of the quantities of
18 power it is prepared to supply the mill and their corresponding costs. By 8
19 a.m. PWCC will provide NSPI its "Day-Ahead Demand Forecast". This will
20 be PWCC's forecast of demand in each hour. The table below provides
21 an example, from NSPI (Synapse) IR-15, of the CQ pairs NSPI might offer
22 for a given hour on the operational day and the demand to which PWCC
23 might commit for that hour.

Table 1. Forecasts for hour ending 1 a.m. on operational day			
	NSPI Day-Ahead Cost Forecast		PWCC Day-Ahead Demand Forecast
Block	MW	Unit cost (\$/MWh)	MW
1	20	45.67	20
2	30	47.98	30
3	60	62.88	60
4	30	122.00	
5	60	230.00	
Total	200		110

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PWCC is only bound to purchase the quantity of power in its Day-Ahead Demand Forecast in a given hour of the operational day if the costs in NSPI's Hour-Ahead Cost Quotes, discussed below, for that given hour during the operational day are equal to or less than the costs that were in NSPI's Day-Ahead Cost Forecast for that given hour.

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During the operational day, on an hourly basis, i.e., 20 minutes prior to the start of each hour, NSPI will provide PWCC an "Hour-Ahead Cost Quote". This will be NSPI's committed quote for CQ pairs for each block of power in the upcoming hour. No later than 10 minutes prior to the hour PWCC will provide NSPI its "Hour-Ahead Demand Requirement". If the cost for a particular block of power in the Hour-Ahead Cost Quote for a given hour is equal to, or less than, the cost for that block of power in that hour from the Day-Ahead Cost Forecast, PWCC is obligated to use that

1 block of power at that actual cost. However in the opposite situation, if the
2 cost for a particular block of power in the Hour-Ahead Cost Quote for a
3 given hour is greater than the cost for that block of power from the Day-
4 Ahead Cost Forecast, PWCC is not obligated to use that block of power.
5 Instead it has the option to operate at a lower level in that hour using the
6 blocks of power for which the CQ pairs in the Hour-Ahead Cost Quote are
7 equal to or less than those from the Day-Ahead Cost forecast. This can be
8 illustrated using the data from Table 1. For example, if the NSPI Hour-
9 Ahead Cost quote for 60 MW in block 3 in a given hour is \$60/MWh, rather
10 than \$62.88/MWh, PWCC is obligated to use that 60MW and pay the
11 \$60/MWh. However, if the NSPI Hour-Ahead Cost quote for that 60MW in
12 a given hour was \$65/MWh, rather than \$62.88/MWh, PWCC is not
13 obligated to use the 60 MW. Instead, PWCC has the option to operate the
14 mill at 50 MW, rather than 110 MW, using the power from block 1 and
15 block 2.

16

17 **Evaluation Criterion**

18 **Q. WHAT CRITERION DID YOU APPLY TO DETERMINE IF THE**
19 **PROPOSED RATE MECHANISM IS JUST AND REASONABLE?**

20 A. In order to determine if the proposed rate mechanism is just and
21 reasonable I evaluated it relative to the third criterion in the Availability
22 section of the currently effective LRT. That criterion specifies that:

1 *the revenue from service to a customer under this rate shall be*
2 *greater than the applicable incremental cost to serve such*
3 *customer and shall make a significant positive contribution to fixed*
4 *costs.*

5 **Q. DOES THE NSPI EVIDENCE DEMONSTRATE THAT THE PROPOSED**
6 **RATE MECHANISM IS JUST AND REASONABLE ACCORDING TO**
7 **THAT CRITERION?**

8 A. No. The NSPI evidence does not demonstrate the proposed rate
9 mechanism is just and reasonable according to this criterion. First, NSPI
10 has not provided a detailed description of the method it will use to
11 determine the actual incremental costs it incurs to supply the mill load.
12 Second, NSPI has not provided a numerical illustration of that method.
13 Third, NSPI has not proposed a process for periodic audits of its
14 calculations by an independent reviewer. Based on those three findings,
15 which I discuss in more detail below, there is a potential that the revenues
16 from the rate mechanism may be less than NSPI's incremental cost to
17 supply the mill.

18 **Q. WOULD NSPI'S OTHER CUSTOMERS BE WORSE OFF IF REVENUES**
19 **FROM THE PROPOSED RATE MECHANISM ARE LESS THAN NSPI'S**
20 **INCREMENTAL COSTS OF SUPPLYING THE MILL?**

21 A. Yes. NSPI's other customers will experience higher rates if revenues from
22 the rate mechanism are less than NSPI's incremental cost to supply the
23 mill. Even if the rate mechanism fails to recover a small portion of the

1 incremental costs of supplying the mill, that shortfall could be a material
2 amount on an annual mill load of 1 million MWh. For example, assume
3 NSPI's average annual incremental cost to supply the mill in a year was
4 close to the variable incremental rate component of the Bowater LRT rate
5 for 2012 of 5.624 cents/kWh. If the NSPI rate mechanism in that year only
6 recovered 98 percent of that incremental cost, that 2 percent shortfall
7 would mean NSPI would not recover approximately \$ 1.1 million of its
8 actual annual incremental costs from the mill in that year ($\$56.24 / \text{MWh} * 1$
9 million MWh * 2%).

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11 **Description of Calculation Methodology and Numerical Illustration**

12 **Q. WHY IS IT IMPORTANT FOR NSPI TO DESCRIBE ITS CALCULATION**
13 **METHOD IN DETAIL AND TO PROVIDE NUMERICAL**
14 **ILLUSTRATIONS?**

15 A. NSPI is proposing to price supply on an hourly basis using a complex
16 approach that is new to its system. Given the complexity of this proposed
17 approach, and the lack of experience with it on the NSPI system, it is
18 important that all parties and the Board have a detailed description of
19 NSPI's calculation method. Numerical illustrations will help all parties
20 understand this calculation method.

21 For example, NSPI has extensive experience with setting rates
22 based on its marginal cost. However, in responses to NSPI (CA) IR-3 and

1 NSPI (CA) IR-13, NSPI is adamant that its proposed rate mechanism is
2 based on its incremental costs not its marginal costs.

3 NSPI makes a clear distinction between marginal generation and
4 incremental generation, and hence between marginal costs and
5 incremental costs. NSPI defines marginal generation as generation it
6 would use or require to serve the next MW. NSPI explains that marginal
7 generation has no significance for NSPI's supply to the NPPH load
8 because:

9 "Serving an incremental industrial load involves re-dispatch of the
10 entire fleet and optimization of fuel blends in achieving emissions
11 caps, rather than considering the energy from marginal units."

12 (Emphasis added)

13 However, NSPI has not provided a detailed description of the method it
14 will use to determine the actual incremental costs it incurs to supply the
15 mill load. In particular NSPI has not provided a detailed definition of
16 incremental costs nor has it included any references to re-dispatch of its
17 entire fleet of generating units in either its LRT or its RTP Protocol.

18 **Q. PLEASE EXPLAIN WHY NSPI WOULD NEED TO "RE-DISPATCH" ITS**
19 **ENTIRE FLEET IN ORDER TO DETERMINE THE INCREMENTAL**
20 **GENERATION IT WILL USE TO SUPPLY NPPH AND THE**
21 **CORRESPONDING INCREMENTAL COST OF THAT GENERATION.**

22 A. NSPI's normal daily economic dispatch analysis identifies the units NSPI
23 plans to dispatch to supply its other customers at least cost. Given the

1 requirement for a Day-Ahead Cost Forecast under the RTP, and the size
2 of the mill load, NSPI would need to run one or more additional economic
3 dispatch analyses in order to determine the incremental generation it will
4 use to supply NPPH and the corresponding incremental cost of that
5 generation.

6 Like most vertically integrated electric utilities, NSPI performs an
7 economic dispatch analysis every day for its upcoming operational day.¹
8 The goal of this day-ahead unit scheduling, or unit commitment, process is
9 to determine which generating units should be on-line in each hour of the
10 operational day and the manner in which each unit should be dispatched
11 in each hour in order to satisfy the forecast demand for the day at the
12 lowest variable production cost for the entire day. This advance analysis is
13 particularly important for utilities such as NSPI, which have coal-fired units
14 that have high “start-up” costs, minimum up times and minimum hourly
15 operating levels. Those operating constraints arise from the technical
16 characteristics of baseload coal units, which have relatively low variable
17 operating costs when dispatched continuously at, or near, their maximum
18 capacity hour after hour, day after day. As a result, if NSPI wants to
19 dispatch a particular coal-fired unit tomorrow, it likely needs to schedule
20 that unit to operate at a steady output in every hour tomorrow in order to
21 minimize the costs to start-up and run that unit. In contrast, NSPI has
22 other units that are relatively economic to dispatch for only a limited

¹ _____. *2008 Nova Scotia Wind Integration Study*. Nova Scotia Department of Energy. Prepared by Hatch Limited. Page 7-17.

1 number of hours of a given day and to operate at different levels of output
2 in each of those limited hours.

3 **Q. PLEASE DESCRIBE THE GENERAL APPROACH YOU EXPECT NSPI**
4 **WILL FOLLOW TO DETERMINE ITS DAY-AHEAD COST FORECAST.**

5 A. I expect NSPI will prepare at least two economic dispatches in order to
6 determine the Day-Ahead Cost Forecast under its RTP protocol, i.e., its
7 forecast of CQ pairs by hour for the operational day. It can make that
8 determination based upon the difference between the results of those two
9 dispatches.

- 10 • The first economic dispatch would be designed to supply NSPI's
11 forecast system-wide load or "base case", i.e. the load of all other
12 customers excluding the mill load. This analysis would identify the
13 generation NSPI would use to supply the Base Case load and the
14 costs associated with that generation.
- 15 • The second economic dispatch would be the "re-dispatch". It would
16 re-dispatch the fleet to supply NSPI's forecast Base Case load plus
17 the forecast mill load. This second analysis would again identify
18 the generation NSPI would use to supply the Base Case plus mill
19 load, and the costs associated with that generation.
- 20 • NSPI would then identify its incremental costs of supplying the mill
21 load by subtracting the results of its first, base case, economic
22 dispatch analysis from its second, base case plus mill load,
23 economic dispatch analysis.

1 **Q. HAS NSPI INDICATED IT WILL USE THIS GENERAL APPROACH TO**
2 **IDENTIFY ITS INCREMENTAL GENERATION AND CALCULATE ITS**
3 **INCREMENTAL COSTS?**

4 A. Yes. NSPI provided a projection of annual incremental generation, and
5 associated incremental cost, to supply NPPH over the period 2013 –
6 2022. That projection illustrates, at a high level, the general approach
7 NSPI plans to use. However, NSPI has stated this is not the actual
8 calculation model it will use to calculate the Day-Ahead Forecasts.

9 NSPI provided the long-term projection of annual incremental costs
10 in response to NSPI (AVON) IR-7. Confidential Exhibit JRH-2 provides
11 several key points from that projection:

- 12 • Page 1 provides NSPI's summary of its approach to identifying the
13 incremental generation and calculating the incremental costs, i.e., it
14 subtracted the results of its Base Case resource plan from the
15 results of its Base Case + Mill Load resource plan;
- 16 • Pages 2 and 3 present various results from the Base Case
17 resource plan and the Base Case + Mill Load resource plan
18 respectively for NSPI's Base Gas + Base Coal pricing scenario;
- 19 • Page 4 presents the sources of incremental generation projected to
20 supply the mill each year. These results indicate that NSPI would
21 use generation from a number of different units to supply the mill
22 each year;
- 23 • Page 5 presents the incremental costs to the mill each year; and

- 1 • Page 6 presents the unit cost of supply to NSPI’s other customers
2 each year under the Base Case resource plan and under the Base
3 Case + Mill Load resource plan respectively. Those unit costs of
4 supply are presented in the columns labeled “Rate No Mill Load
5 (\$/MWH)” and “Rate With Mill Load Removed (\$/MWH)”
6 respectively.

7 NSPI prepared these projections as high level estimates using
8 Strategist, which is a computer model that provides a simplified simulation
9 of the operation of the NSPI system. NSPI has indicated that it will not be
10 using Strategist to calculate incremental costs under its RTP (NSPI
11 (Synapse) IR-9 supplemental).

12 **Q. DID NSPI PROVIDE A DETAILED DESCRIPTION OF THE METHOD IT**
13 **WILL USE TO DEVELOP EITHER ITS DAY-AHEAD COST**
14 **FORECASTS OR ITS HOUR-AHEAD COST QUOTES?**

15 A. No. The RTP protocol does not define incremental costs nor does it
16 describe the method NSPI will use to develop the CQ pairs. NSPI did not
17 provide an example of the methodology it will use to develop its daily
18 forecasts of hourly incremental quantities and costs in response to either
19 NSPI (Synapse) IR-15 or NSPI (Avon) IR-22.

20 **Q. COULD NSPI UNDER-RECOVER ITS INCREMENTAL COSTS UNDER**
21 **THE PRICING METHOD PROPOSED IN THE RTP?**

1 A. Yes. In the absence of a detailed description of the calculation
2 methodology with supporting numerical examples, a simple reading of the
3 RTP protocol indicates at least two possible circumstances under which
4 NSPI could under-recover its incremental costs.

5 The first potential source of under-recovery arises from the
6 potential mismatch between the maximum quantity of incremental supply
7 each hour NSPI assumes to develop its Day-Ahead Cost Forecast and the
8 quantity of supply to which PWCC commits in its Day-Ahead Demand
9 Forecast. The NSPI Day-Ahead Cost Forecast will consist of CQ pairs for
10 blocks of power in each hour whose quantities will add up to the maximum
11 quantity PWCC might use each hour. In its Day-Ahead Demand Forecast
12 PWCC can choose a sub-set of those CQ pairs each hour, such that it
13 commits to a total level of demand in each hour that is less than its
14 maximum possible demand.

15 The potential for a shortfall in recovery of actual incremental costs
16 under this aspect of the RTP can be illustrated by reference to the CQ
17 data presented in Table 1. Assume that NSPI has prepared a Day-Ahead
18 Cost Forecast based on a forecast that PWCC may require up to 200 MW
19 in each hour of the operational day. Further assume that PWCC responds
20 to the CQ pairs in that Forecast by submitting a Day-Ahead Demand
21 Forecast under which it commits to three CQ pairs adding up to a total
22 demand in each hour of 110 MW. Under this circumstance the question is
23 whether NSPI's actual incremental costs to supply that 110 MW will be

1 higher than the costs it had quoted in the Day-Ahead Cost Forecast
2 because it will be dispatching its system to meet a total incremental load
3 of 110 MW each hour rather than the total incremental load of 200 MW
4 each hour used to develop its Day-Ahead Cost Forecast.

5 The second potential source of under-recovery arises from the fact
6 that the RTP requires PWCC to provide NSPI a Day-Ahead Demand
7 Forecast but does not require PWCC to actually use and pay for the
8 quantities in that demand forecast in hours in which NSPI's Hour-Ahead
9 Cost quote for a block of power in given hour is greater than the cost
10 quote for that block of power in that hour from the Day-Ahead Cost
11 Forecast. Under those circumstances PWCC has the option to decrease
12 its demand forecast and not pay that Hour-Ahead Cost. This provision of
13 the RTP creates the potential for NSPI to under-recover some amount of
14 its incremental costs.

15 This potential for a shortfall can be illustrated through a simple
16 example using CQ data presented in Table 1. Assume that PWCC has
17 submitted a Day-Ahead Demand Forecast under which it has committed
18 to three CQ pairs, totaling 110 MW, for hour 1 of the operational day. At
19 twenty minutes before hour 1 of the operational day NSPI sends PWCC its
20 Hour-Ahead Cost Quote for hour 1. Assume NSPI's Hour-Ahead Cost
21 quote for block 3 is \$65/MWh rather than the \$62.88/MWh in its Day-
22 Ahead Cost Forecast. In response to that quote PWCC elects to decline
23 that CQ block and to reduce its actual demand in that hour to 50 MW.

1 Under this circumstance the question is whether NSPI can avoid incurring
2 100 percent of the \$65/MWh it has estimated as the actual cost of
3 supplying the mill with 60 MW in hour 1. If NSPI cannot avoid incurring
4 100 percent of the \$65/MWh, its revenues for that hour will be less than
5 the incremental cost it actually incurred to supply the mill in that hour.

6 **Q. IS THERE AN APPARENT INCONSISTENCY BETWEEN NSPI'S**
7 **CURRENT DAY-AHEAD UNIT SCHEDULING AND ITS PROPOSED**
8 **RTP PROTOCOL?**

9 A. Yes. According to the 2008 Nova Scotia Wind Integration Study prepared
10 for the Nova Scotia Department of Energy, NSPI does not finalize its day-
11 ahead unit schedule for its system wide load until approximately noon of
12 the day prior to the operational day. However, as noted earlier, the RTP
13 requires NSPI to send PWCC its Day-Ahead Cost Forecast by 7 a.m. of
14 the day prior to the operational day.

15 **Independent Audit of CQ Pairs**

16 **Q. WHY IS IT IMPORTANT FOR THERE TO BE PERIODIC INDEPENDENT**
17 **AUDITS OF NSPI'S CALCULATIONS OF ITS INCREMENTAL COSTS**
18 **UNDER THE LRT?**

19 A. If approved, NSPI will be implementing a new, complex approach to
20 pricing its supply under the LRT. Given the complexity of this proposed
21 approach, and the lack of experience with it on the NSPI system, it is
22 important that it be subject to periodic independent audits. These audits
23 are particularly important to ensure that the NSPI is applying its rate

1 mechanism in a manner that identifies its actual incremental costs of
 2 supplying NPPH and recovers all of those incremental costs.

3

4 **D. EXCLUSION OF INCREMENTAL RENEWABLE ENERGY COSTS**

5 **Q. IS NSPI PROPOSING TO INCLUDE THE MILL LOAD WHEN**
 6 **CALCULATING ITS OBLIGATION UNDER THE RENEWABLE ENERGY**
 7 **STANDARDS (RES)?**

8 A. Yes. According to NSPI (Avon) 1-19 NSPI is proposing to include the mill
 9 load when calculating its obligation under the RES. NSPI identifies the
 10 incremental impact of the mill load on its obligation under the RES in NSPI
 11 (Synapse) 1-8. Table 2 summarizes NSPI's projection that the
 12 incremental impact of the mill load in 2015 and 2020 respectively.

13

Table 2

	2015 (RES @ 25%)				2020 (RES @ 40%)		
	Base Case	Base Case + Mill Load	Increment		Base Case	Base Case + Mill Load	Increment
Sales (GWh)	10,043	10,977	934		9,961	10,896	935
RES Requirement (GWh)	2,511	2,744	233		3,985	4,358	373
Renewable energy from projects under commitments as of April 2012 (GWh)	2,709	2,679	-30		4,026	3,996	-30
Surplus (Deficit)	198	(65)	(263)		41	(362)	(403)

14

1 Q. IS IT POSSIBLE NSPI WILL INCUR INCREMENTAL RENEWABLE
2 ENERGY COSTS ASSOCIATED WITH ITS INCLUSION OF THE MILL
3 LOAD WHEN CALCULATING ITS OBLIGATION UNDER THE RES?

4 A. Yes. NSPI maintains that it has a surplus of renewable energy relative to
5 its RES obligations through 2014. However, as indicated in Table 2, NSPI
6 projects that including the mill load in its RES obligation from 2015 onward
7 may require it to commit to, and acquire, additional quantities of renewable
8 energy to meet its RES obligations. Those additional quantities will result
9 in incremental costs. For example, if the additional renewable energy
10 NSPI has to acquire costs \$30/MWh more than its other supply costs,
11 NSPI's incremental cost of acquiring additional renewable energy in 2015
12 could be approximately \$1.95 million at a minimum (65 GWh * \$30/MWh).
13 NSPI's actual incremental renewable energy costs would likely be higher
14 because it might acquire a somewhat greater quantity to allow for factors
15 such as forecast error, project under-performance and project timing
16 delays.

17 NSPI projects that it would need to acquire substantial additional
18 renewable energy in 2020 if the renewables requirement under the RES
19 were to increase to 40% from the 25% requirement in 2015. Under that
20 scenario NSPI's incremental renewable energy costs associated with
21 supplying the NPPH load would be approximately \$10.9 million, assuming
22 the same premium of \$30/MWh above existing supply costs (362 GWh *

1 30). Again, this is a conservative estimate. NSPI's actual incremental
2 renewable energy costs would likely be higher.

3 **Q. IS IT CLEAR THAT NSPI IS REQUIRED TO INCLUDE THE MILL LOAD**
4 **WHEN CALCULATING ITS RES OBLIGATION?**

5 A. No. NSPI's proposal to include the mill load in its determination appears
6 to be a policy decision by NSPI. The RES explicitly applies to sales by a
7 load-serving entity to a customer. However, the RES does not appear to
8 apply to the type of self-supply arrangement that NSPI is proposing under
9 the Partnership.

10 **Q. IS NSPI PROPOSING TO RECOVER ITS INCREMENTAL RENEWABLE**
11 **ENERGY COSTS ASSOCIATED WITH SUPPLYING THE MILL UNDER**
12 **ITS PROPOSED RATE MECHANISM?**

13 A. No, per NSPI (Synapse) IR 9 f.

14 **Q. WILL THE PROPOSED RATE MECHANISM BE JUST AND**
15 **REASONABLE IF NSPI DOES NOT INCLUDE THE INCREMENTAL**
16 **RENEWABLE ENERGY COSTS ASSOCIATED WITH SUPPLYING THE**
17 **MILL IN THE INCREMENTAL COSTS IT CHARGES FOR THAT**
18 **SUPPLY?**

19 A. No. If NSPI does not include the incremental renewable energy costs
20 associated with supplying the mill in the incremental costs it charges for
21 that supply, its rates under the LRT will not produce revenues greater than
22 its incremental costs. I recommend that NSPI avoid incurring those

1 incremental renewable energy costs by excluding mill load from its RES
2 obligation or that NSPI include those costs as a component of the
3 incremental costs it recovers under the LRT.

4

5 **E. ADVERSE FINANCIAL IMPACTS ASSOCIATED WITH THE LRT**

6 **Q. PLEASE SUMMARIZE NSPI'S REQUEST TO BE HELD HARMLESS**
7 **FROM ANY ADVERSE FINANCIAL IMPACTS THAT MIGHT RESULT**
8 **FROM THE PROPOSED LRT.**

9 A. NSPI has identified tax reassessment / penalties that CRA might levy and
10 the cost of eliminating pre-existing environmental contamination on the
11 mill site as potential adverse financial impacts that might result from the
12 proposed LRT. NSPI has requested that it be held harmless from those
13 potential adverse financial impacts.

14 **Q. PLEASE DISCUSS THE POTENTIAL ADVERSE FINANCIAL IMPACT**
15 **OF A TAX REASSESSMENT OR PENALTY BY CRA.**

16 A. NSPI has identified potential adverse financial impacts of a tax
17 reassessment or penalty by the CRA in NSPI (Synapse) IR-5 f. NSPI
18 states that the risk of those adverse impacts is low, but in the unlikely
19 event of a reassessment there are numerous potential risks.

20 NSPI has not provided an estimate of those potential risks. One
21 can develop an order of magnitude estimate as follows. Assume the
22 average annual LRT rate of the Partnership is comparable to the variable

1 incremental rate component of the Bowater LRT rate for 2012 of 5.624
2 cents/kWh, or \$56.24/MWh, and CRA levies a tax reassessment of 31%
3 on that rate multiplied by the mill's load in a given year. The adverse
4 financial impact based on those assumptions would be over \$17.4 million
5 for that year ($\$56.24/\text{MWh} * 1,000,000 \text{ MWh} * 31\%$) plus any applicable
6 interest and penalties.

7 NSPI takes the position that it should not be penalized for any
8 adverse financial impacts that may result from the proposed arrangement
9 because it will not receive a direct financial benefit from the arrangement
10 (NSPI (Avon) IR-2). That position is not a sufficient rationale for the
11 NSUARB to approve NSPI's request to be held harmless from all financial
12 adverse impacts that may result from the LRT. NSPI has the
13 responsibility and authority to take all the steps necessary to avoid and/or
14 mitigate all potential risks associated with the LRT, including ensuring that
15 their Partnership arrangement is designed and implemented in compliance
16 with CRA requirements.

17 **Q. PLEASE DISCUSS THE POTENTIAL ADVERSE FINANCIAL IMPACT**
18 **OF CLEANING UP PRE-EXISTING ENVIRONMENTAL**
19 **CONTAMINATION AT THE MILL SITE.**

20 A. NSPI discusses the potential adverse financial impact of cleaning up pre-
21 existing environmental contamination at the mill site in NSPI (Synapse) IR-
22 25. NSPI indicates that it is working with the Government of Nova Scotia
23 to achieve an acceptable solution to this potential adverse financial

1 impact, and that it will update its Evidence once a final resolution is
2 achieved. It appears that NSPI will not proceed with the Partnership if it
3 does not reach an acceptable resolution with the Province of Nova Scotia
4 and with PWCC.

5 **Q. SHOULD THE BOARD APPROVE NSPI'S REQUEST TO BE HELD**
6 **HARMLESS FROM ANY ADVERSE FINANCIAL IMPACTS THAT**
7 **MIGHT RESULT FROM THE PROPOSED LRT?**

8 A. No. The NSUARB should not approve NSPI's request to be held harmless
9 from any future adverse financial impacts that may arise from the LRT. If
10 an adverse financial impact does arise from the LRT in the future, I
11 recommend that the NSUAB determine the appropriate ratemaking
12 treatment of that impact at that time based on its review of the facts
13 specific to that impact.

14 **Q. DOES THIS CONCLUDE YOUR DIRECT EVIDENCE?**

15 A. Yes.

LIST OF EXHIBITS

- | | |
|-------|--|
| JRH-1 | Resume of J. Richard Hornby |
| JRH-2 | NSPI projection of annual incremental generation to supply
NPPH from 2013 to 2022. (Confidential) |

James Richard Hornby

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA.

Senior Consultant, 2006 to present.

Provides analysis and expert testimony regarding resource planning and ratemaking issues in the electricity and natural gas industries. Resource planning related projects include evaluation of the potential impacts of a renewable and energy efficiency portfolio standard in Kentucky, evaluation of Oklahoma Gas & Electric wind power purchase agreements and associated transmission project and projections of long-term avoided costs of electricity and natural gas. Ratemaking projects include evaluation and testimony regarding proposals for advanced metering infrastructure (AMI or smart grid) and dynamic pricing in several states. Major projects regarding alignment of financial incentives with aggressive pursuit of energy efficiency by electric and gas utilities include testimony on the “save-a-watt” approach proposed by Duke Energy in North Carolina, Indiana and South Carolina.

Charles River Associates (formerly Tabors Caramanis & Associates), Cambridge, MA.

Principal, 2004-2006, *Senior Consultant*, 1998–2004.

Expert testimony and litigation support in energy contract price arbitration proceedings and various ratemaking proceedings. Productivity improvement project for electric distribution companies in Abu Dhabi. Analyzed market structure and contracting issues in wholesale electricity markets.

Tellus Institute, Boston, MA.

Vice President and Director of Energy Group, 1997–1998.

Manager of Natural Gas Program, 1986–1997.

Presented expert testimony on rates for unbundled retail services, analyzed the options for purchasing electricity and gas in deregulated markets, prepared testimony and reports on a range of gas industry issues including market structure, strategic planning, market analyses, and supply planning.

Nova Scotia Department of Mines and Energy, Halifax, Canada.

Member, Canada-Nova Scotia Offshore Oil and Gas Board, 1983–1986.

Assistant Deputy Minister of Energy 1983–1986.

Director of Energy Resources 1982-1983

Assistant to the Deputy Minister 1981-1982

Nova Scotia Research Foundation, Dartmouth, Canada, *Consultant*, 1978–1981.

Canadian Keyes Fibre, Hantsport, Canada, *Project Engineer*, 1975–1977.

Imperial Group Limited, Bristol, England, *Management Consultant*, 1973–1975.

EDUCATION

M.S., Technology and Policy (Energy), Massachusetts Institute of Technology, 1979.

B.Eng., Industrial Engineering (with Distinction), Dalhousie University, Canada, 1973

NSPI projection of annual incremental generation to supply NPPH, 2013 - 2022

(Confidential)