

**THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION**

DE 11-250

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

INVESTIGATION OF MERRIMACK STATION SCRUBBER PROJECT AND COST RECOVERY

CONSERVATION LAW FOUNDATION'S POST-HEARING BRIEF

NOW COMES the Conservation Law Foundation (“CLF”) and submits the following written closing brief.

INTRODUCTION

In its simplest sense, this docket raises three questions:

(1) Was it prudent for PSNH to construct the scrubber in light of increased cost estimates, changing market conditions, and reasonably foreseeable costs of complying with future environmental regulations?

(2) If so, did PSNH prudently incur some or all of the expenses related to actual construction of the scrubber?

(3) And finally, what amount, if any, should PSNH be entitled to recover from its base ratepayers as costs prudently related to installing the scrubber?

CLF’s brief focuses on the first and third questions.¹ The evidence at hearing revealed that PSNH acted imprudently when it failed to conduct a meaningful economic analysis and

¹ CLF also supports arguments raised by other parties, including TransCanada, that PSNH acted imprudently when it withheld certain information from the Commission and Staff, in particular during the summer of 2008 and the pendency of DE 08-103.

proceeded to construct the scrubber in March 2009.² Because the evidence showed that market and regulatory circumstances at that time did not justify constructing of the scrubber, all costs associated with installing the scrubber and incurred after March of 2009 should not be allowed into rates, even if prudently managed.

ARGUMENT

I. Relevant Legal Background:

In 2006, the New Hampshire legislature passed the “scrubber law” which mandated that the owner of Merrimack Station install a wet flue gas desulfurization system (“scrubber”) at the facility no later than July 1, 2013, in a manner that did not jeopardize electric reliability and imposed only reasonable costs on consumers. RSA 125-11. If the owner of Merrimack Station was a regulated utility, it could recover the *prudently* incurred costs of installing the scrubber through its default service charge, in a manner approved by the public utilities commission. RSA 125-018 (emphasis added). If the regulated utility divested itself of Merrimack Station, it could seek recovery of its scrubber-related costs pursuant to RSA 369:B:3-a. RSA 125-018.

During the time that the legislature contemplated the scrubber law, PSNH presented evidence that the costs of installing the scrubber would total about \$250,000,000. By the spring of 2008, however, PSNH knew that constructing the scrubber had escalated to \$457,000,000. Thereafter, this Commission opened Docket No. DE 08-103, “Investigation of PSNH’s Installation of Scrubber Technology.” See Secretarial Letter dated August 22, 2008, Docket No.

² TransCanada’s expert, Mr. Hachey, opined that PSNH should have recognized by September of 2008 that it was imprudent to proceed with the scrubber. The Office of Consumer Advocate’s expert, Mr. Kahal, opined that the company should have recognized by late 2008-early 2009 that constructing the scrubber was imprudent, but that it still could have cancelled the project after that. CLF’s expert concurred with Mr. Kahal’s opinion. CLF does not, however, oppose Mr. Hachey’s position. This Commission could find that PSNH had an obligation at any point after the summer of 2008 and before beginning major construction to analyze whether to proceed to install the scrubber, and that it could have cancelled the project at any time into 2010, as opined by Mr. Kahal.

DE 08-103. That docket examined whether the Commission had authority to determine in advance whether installing a scrubber at PSNH's Merrimack Station was in the public interest. See Order 24,914. On November 12, 2008, the Commission issued an order finding that, although RSA 125-0:17 did not authorize the Commission to predetermine whether PSNH may proceed with installing scrubber technology, it did authorize "the Commission to consider, in the context of a later prudence review, arguments as to whether PSNH had been prudent *in proceeding with installation of scrubber technology in light of increased cost estimates and additional costs from other reasonably foreseeable regulatory requirements such as ...the Clean Air Act, 42 U.S.C. § 7401 et seq., and the Clean Water Act, 33 U.S.C. §1251 et seq.*" See Order 24,914 at 12 (emphasis added). The instant docket constitutes the "later prudence review" ordered by the Commission.

Despite the clear language of Order 24,914, PSNH has filed a series of pleadings in this docket, arguing that it had a legislative mandate to construct the scrubber. In PSNH's view, this Commission's review is limited solely to determining whether PSNH prudently managed the actual construction. The Commission has consistently ruled against PSNH, finding that it retained, at all times, the obligation to engage in good utility management, and had the discretion to choose between constructing the scrubber or divesting itself of or retiring Merrimack Station. See e.g. Order No. 25,506 at 17 (PSNH had obligation to engage in good utility management at all times); Order No. 25,546 at 7 and 10 (scope of Commission's review determined by management discretion PSNH had under existing law and is therefore more comprehensive than a simple inquiry into whether PSNH did an adequate job of managing funds expended to construct the scrubber; PSNH retained management discretion to divest or retire Merrimack Station. If evidence showed that market and regulatory circumstances at the time decisions were

made did not justify continued operation of the plant with the scrubber installed then the costs of complying with the Scrubber Law would not be allowed into rates, even if prudently managed); Order No. 25,565 at 15-19 (PSNH retained the management discretion to divest itself of or to retire Merrimack Station, and Commission would accept evidence and make findings related to those management decisions).

Most recently the Commission admonished PSNH that its arguments “travel[ed] a well worn path.” Order 25,772 at 6. The Commission has repeatedly and consistently told PSNH that it bore the obligation to exercise prudent utility management. In fact, PSNH was on notice in 2008 - before it commenced major construction of the scrubber - that the Commission would conduct a later prudence review and consider arguments as to whether PSNH had been prudent in proceeding with the Scrubber in light of increased cost estimates and additional costs from other reasonably foreseeable regulatory requirements such as’ environmental statutes. *Id.* at 7, citing Order No. 24,914 at 13.

As to the actual scope of its prudence review, this Commission has stated:

[A]prudence review is more encompassing and fundamentally different than a determination that Scrubber technology is best at reducing mercury emissions at a reasonable cost. As we have said in the past, prudence is commonly associated with diligence and contrasted with negligence. Utility Property Tax Abatements and Limitation of Expenses, DE 11-250 - 20 -Order No. 21,712, 80 NH PUC 390, 392-93 (1995). When reviewing whether a utility has been prudent in its decision making, we “may reject management decisions when inefficiency, improvidence, economic waste, abuse of discretion or action inimical to the public interest are shown.” Appeal of Easton, 125 N.H. 205, 215 (1984) citations and quotations omitted. Other commissions have taken a similarly broad view of the prudence inquiry:

[Prudence] is the degree of care required by the circumstances under which the action or conduct is to be exercised and judged by what is known, or could have reasonably been known, at the time of the conduct. In other words, whether an action will be considered prudent depends on whether the action would be considered reasonable by a person with similar skills and knowledge under similar circumstances. It is a term often used interchangeably with what is considered “reasonable” under

the circumstances. The Commission must determine whether decisions were made in a reasonable manner in light of the conditions or circumstances that were known or reasonably should have been known when the decision was made.

Duke Energy Indiana, Inc., Cause No. 43114 IGCC 4S1, PUR slip copy at 108, 2012 WL 6759528 at *108 (IURC December 27, 2012).

Order 25,565 at 20.

II. PSNH acted imprudently when it proceeded to construct the scrubber despite increased cost estimates, changing market conditions, and reasonably foreseeable costs of complying with future environmental regulations.

With respect to the first question before this Commission, the Commission must find that PSNH acted imprudently when it ignored the law and this Commission's November 2008 Order and performed no economic analysis to address whether it was prudent to construct the scrubber in March of 2009. As PSNH testified, despite existing statutory law and all the orders issued by this Commission, to PSNH it remained "beyond belie[f]" that they had a legislative mandate to build the scrubber, no matter the economic circumstances. Large and Vancho Rebuttal Testimony, Day 6 PM 52:22-53:2. This Commission cannot condone that irrational position.

As PSNH's prudence expert testified: Whether or not PSNH was prudent is a question of interpretation - is the interpretation that the Company placed on the scrubber law at the time within a range of what a reasonable person would have done? If the act is capable of being misinterpreted by a reasonable person, and if a reasonable person could have come to the same conclusion as PSNH, then that conduct would be in the range of reasonable behavior. Reed Testimony, Day 7 AM 128:4-23. Clearly the plain language of the relevant statutory law coupled with the language in Order 24,914, left no doubt regarding how to interpret the scrubber law. PSNH's position cannot be deemed reasonable.

In addition, PSNH cannot rely upon any arguments that: if the legislature wanted PSNH to analyze whether it was prudent to build the scrubber it could have passed a study bill in 2009; its 2008 informational analysis somehow sufficed as prudent analysis; or that the analysis performed by NERA, which PSNH hired in 2013 to rebut the testimony of other witnesses, retrospectively justifies installing the scrubber in 2009.

A. PSNH's argument that the Legislature negated the need for economic study must fail.

PSNH argued that it had no obligation to analyze whether to build the scrubber, because the legislature chose not to pass a study bill in 2009. The state senate deemed the study bill, SB 152, inexpedient to legislate. That bill would have required the Commission to investigate whether installing mercury scrubber technology at Merrimack Station was in the interest of PSNH's retail customers. See <http://www.gencourt.state.nh.us/legislation/2009/SB0152.html>; see also Large and Vancho Rebuttal Testimony, Day 6 PM 53:3-11 (would have required PSNH to study whether to construct scrubber). Failure to pass the bill did not usurp this Commission's authority to conduct a prudency review, nor did it strip PSNH of its duty to engage in prudent utility management. This Commission has ruled:

We see no relevance to PSNH's, or Mr. Long's involvement in cooperating with the Legislature to pass the Scrubber law, or to Mr. Long's alleged attempts to block the Legislature or this Commission from looking further into whether PSNH should have proceeded with the Scrubber project. PSNH is not responsible for the Legislature's actions, nor for ours.

Order 25,566 at 5. What is relevant from PSNH's lengthy testimony before the legislature is that the company opposed any study of the scrubber, Large and Vancho Rebuttal Testimony, Day 6 PM 53:12-21 and Day 6 PM 61:14-62:7, arguing that no study was needed because PSNH understood that this Commission would conduct a later prudency review and disallow recovery

of all unreasonable costs associated with the scrubber. For example, PSNH's President and COO, Gary Long, testified:

But that's not, you know, what we're trying to do is to have the lowest-cost power that we can for the benefit of customers. But if people think that we're out of line, they have recourse. They have recourse through a prudency review, and they have recourse by, they can make a choice for a different power supplier. ...

It is the normal standard for the Public Utilities Commission to review our actions and our decisions, and it's done in hindsight. So it certainly presents business risk, as you might have a difference of opinion. We might think we made a good decision. Somebody else might think we made a bad decision. But I think the Commission has found over and over again that we're making good decisions. But yes, that's the normal course. And that's okay. We're prepared for that and totally used to that...But financially we have to be very sure of what we're doing, because if we're reckless or if we make bad decisions, it'll hurt, it'll come back on us.

Day 6 PM 57:19-58:19 (quoting Long testimony (Exh 27-17)). The legislature took no action in March of 2009 to limit or usurp this Commission's later prudency review, as permitted by statutory law and described in Order 24,914.

Because existing law clearly permits this Commission and not the legislature to conduct and define the contours of a prudency review, this Commission should disregard any argument that the Legislature dictated whether or not PSNH should conduct economic study of the scrubber before proceeding with major construction in March of 2009. That is the role of this Commission.

B. The informational economic analysis PSNH conducted during the summer of 2008 is insufficient to support a finding of prudence.

PSNH conducted limited economic analysis in June of 2008 as part of the company's internal review process for large capital projects. Smagula Testimony, Day 1 AM 78:9-16; Exh. 23: Large and Vancho Rebuttal Testimony at 4:8-10; Large and Vancho Rebuttal Testimony, Day 5 PM 104: 1-7. It did the analysis "for informational purposes," and not to "form the basis

for determining whether the Project should go forward or not.” Large and Vancho Rebuttal Testimony, Day 5 PM 100: 13-17. It updated the analysis once, in August of 2008, in response to the Commission’s August 22, 2008 secretarial letter in De 08-103. Large and Vancho Rebuttal Testimony, Day 5 PM 101: 18-22. PSNH conducted no further analysis after August and before commencing major construction of the scrubber in March of 2009. Up until March, no major construction had commenced, because PSNH had not yet obtained all of the necessary permits. Large and Vancho Rebuttal Testimony, Day 5 PM 101: 22-23, Day 6 AM 32: 21-33:1, and Day 6 AM 57: 11-21; See Exh 27: Long Depo at 204:20-23 (no major construction in 2008), 205:4-10 (needed local construction permits and temporary air quality permit from Department of Environmental Services to begin major construction), and 207:4-7 (Long Depo Exh 18 and testimony that air permit issued March 2009); Stanton Testimony, Day 4 AM 43:4-9; Franz Testimony Day 2 AM: 114:5-7.

The June 2008 informational analysis cannot serve to justify constructing the scrubber in March of 2009 because it was never intended for that purpose, and relied upon a variety of factors that changed after the summer, in a manner that should have concerned a prudent utility. See e.g. Exh 17: Kahal Prefiled Testimony at 6-7 and 38-48(comparing PSNH behavior to another utility which updated analysis and cancelled major capital project during similar time period) and 22 (listing concerns with data input assumptions). For example, PSNH assumed a capacity factor of 86%. Large and Vancho Rebuttal Testimony, Day 6 AM 41: 5-10. By early 2009, PSNH should have realized that with the drop in natural gas prices, their assumed capacity factor over predicted future use of Merrimack Station, which was transitioning from a base to intermediate or peak load facility. See Exh 27: Long Depo at 199:1-4. Dr. Stanton, for example, assumed a 72% capacity factor because she was projecting future capacity not looking at the

historic past. Stanton Testimony, Day 4 AM 86:10-14 and 87:1-9. To predict future capacity, a prudent utility could look at historic usage of the coal plant, but must also weigh that usage against capacity factors at similar plants in New England, migration rates, and other factors pushing towards the idea that the capacity factor would be lower in the future. Stanton Testimony, Day 4 AM 87:16-88:3 and 88:4-24.

In addition, PSNH's June 2008 analysis assumed that market prices would be based on natural gas pricing, and an \$11 per million Btu natural gas price beginning in 2012 and escalating at 2.5% going forward. Large and Vancho Rebuttal Testimony, Day 5 PM 110: 15-22 and 111: 10-14. In PSNH's presentation to its Risk and Capital Committee, it stated that the net customer impact break-even rates for natural gas prices could drop 90 cents before hitting the break-even point. Large and Vancho Rebuttal Testimony, Day 6 AM 82: 2-6. Based upon that information, a prudent utility should have continued tracking natural gas prices before beginning construction. If PSNH had done so, it would have known that natural gas prices fell much more than 90 cents. In fact, the \$11 per million Btu gas price was an accident of timing. Kahal Testimony, Day 3 AM 60:12-15. The price fell from \$11 per million Btu to \$6.74 million Btu in Oct 2008 to \$3.96 million Btu in March 2009. Franz Testimony, Day 2: 71:9-15, Exh 53.

By way of another example of the need for updated analysis, PSNH assumed \$500 for an S02 credit price, despite the fact that the price had dropped to below \$200 by the summer of 2008. Large and Vancho Rebuttal Testimony, Day 5 PM 113:10-114:5; Day 6 AM 38: 10-14, Exh 117 (shows S02 prices down under \$200 in 2008). Thereafter the S02 credit price dropped even further to "very small dollars." Large and Vancho Rebuttal Testimony, Day 5 PM 115: 14-20.

Finally PSNH admits, as it must, that it's analysis never considered the impact of customer migration rates (Large and Vancho Rebuttal Testimony, Day 6 PM 52:3-9), the significant drop in natural gas prices (Large and Vancho Rebuttal Testimony, Day 6 AM 140:22-141:1 and Day 6 PM 43:9-18), or whether to divest (Large and Vancho Rebuttal Testimony, Day 6 PM 52:10-16) or retire Merrimack Station in lieu of building the scrubber. Large and Vancho Rebuttal Testimony, Day 6 PM 52:17-21. It did not consider those factors because to the company it was "beyond belie[f]" that they had a legislative mandate to build the scrubber, no matter the change in economic circumstances. See Large and Vancho Rebuttal Testimony, Day 6 PM 52:22-53:2.

For these reasons, the Commission cannot find that the informational study conducted by PSNH during the summer of 2008 justified building the scrubber in 2009.

C. PSNH acted imprudently by failing to analyze whether it was economic to construct the scrubber in March of 2009.

A prudent utility would have recognized the changing economic circumstances in late 2008-early 2009. It would have considered the language of Order 24,914, possibly supported SB 152, and certainly conducted economic analysis to determine whether constructing the scrubber still made sense. Both Mr. Kahal and Dr. Stanton testified that PSNH should have analyzed whether to proceed with construction of the scrubber during the first quarter of 2009. See Kahal Testimony, Day 3 AM 40:19-41:2; Stanton Testimony, Day 4 AM 40:19-24 and 43:4-9. PSNH's rebuttal witnesses, Drs. Harrison and Kaufmann (NERA), also used early 2009 as a reference point for their analysis. NERA Rebuttal Testimony, Day 6 Late PM 16:14-17:3.

Mr. Kahal opined that PSNH's decision to proceed with the scrubber in the summer of 2008 was aggressive but not unreasonable. Kahal Testimony, Day 3 AM 10-11. The company

should have, however, updated their analysis over the ensuing 3, 6, and 9 months in light of the dramatic changes in gas markets and long-term outlook for price of gas. Mr. Kahal opined that an updated study would have resulted in finding the project uneconomic. Kahal Testimony, Day 3 AM 12:2-19. He further opined that the critical time for review would have been the end of 2008 and beginning 2009, when the information could have been used by the Commission or legislature to reconsider the project. Kahal Testimony, Day 3 AM 40:19-41:2.

Dr. Stanton reached a similar conclusion. She opined that PSNH had a prudence obligation to perform an economic analysis in early 2009. Stanton Testimony, Day 4 AM 42:8-11. Between the summer of 2008 and early 2009, expected natural gas prices, expected wholesale energy prices, expected capacity factors, the expected cost of the scrubber, and the rate of migration of customers from PSNH all changed. These changes should have caused a prudent utility manager to reassess the net benefits of the scrubber project before beginning major construction. Exh 21: Prefiled Stanton Testimony at 8. At that point, Dr. Stanton believes that, had it done so, PSNH would have decided not to go forward with the scrubber. Stanton Testimony, Day 4 AM 42:12-14.³ In fact, Dr. Stanton noted that her results – which found the scrubber uneconomic when compared to purchasing energy from the market – were consistent with the conclusions of Mr. Kahal and the NERA witnesses retained by PSNH to perform economic analysis in rebuttal to Dr. Stanton’s testimony. Stanton Testimony, Day 4 AM 44:3-6.

³ Dr. Kahal provides an excellent example in his testimony of another utility which, when faced with similar circumstances, did in fact abandon its project. See Exh 17: Prefiled Kahal Testimony at 38-48 (comparing behavior of ELL with PSNH, and finding PSNH behavior imprudent and unreasonable).

i. NERA and Stanton both concluded that it would have cost less for PSNH to purchase energy than to construct the scrubber

NERA and Dr. Stanton employed conceptually equivalent methodology in their analysis. NERA Testimony, Day 6 Late PM 21:12-24; Exh 24: NERA prefiled testimony at 26 (The methodology of Dr. Stanton's analysis is in general quite similar to the methodology of our analysis). Dr. Stanton constructed a cash flow analysis from 2008 through 2027; she used 2008 as the last year of data prior to 2009 (when major construction commenced) and 2027 as the end of the useful life of the scrubber. Stanton Testimony, Day 4 AM 40:19-24 and Day 4 AM 43:4-9. NERA used the same time frame. See e.g. NERA Testimony, Day 6 Late PM, 35:1-5, Exh 24-7 and 24-8.

Both NERA and Stanton developed a number of different scenarios to account for future uncertainties. Dr. Stanton developed five scenarios, comparing the costs of building the scrubber to purchasing energy from the market. Stanton Testimony, Day 4 AM 41:14-18. NERA developed six scenarios making that comparison, and twelve scenarios comparing the costs of the scrubber to building a natural gas plant. See e.g. Exh 24-14a and Exh 24-14b.

Dr. Stanton examined two main variables she considered to be uncertain—future environmental costs and natural gas prices as they affected wholesale energy prices. Stanton Testimony, Day 4 AM 41:18-24. For these variables, she gave high, medium and low ranges based on information existing and available to PSNH at the time. Stanton Testimony, Day 4 AM 41:24-42:1. NERA also contemplated natural gas prices and future environmental costs. See Exh 24 and associated attachments.

Dr. Stanton concluded in four out of five scenarios that the costs of running the plant with the scrubber were higher than the revenues received from running it. Stanton Testimony, Day 4

AM 42:4-8; see also Exh 20-7.⁴ Therefore it would be more economic to purchase energy from the market.

NERA reached a near identical conclusion. It created six scenarios comparing the scrubber to market purchases, which was conceptually equivalent to what Dr. Stanton did in her analysis. See e.g. Exh 24-12,14a and 14b; NERA Testimony, Day 6 Late PM 21:13-24. This assumption made sense because NERA understood that PSNH had the ability to purchase power in the ISO-NE market. NERA Testimony, Day 6 Late PM 22:4-11. In four out of the six scenarios, it cost less to purchase energy from the market than to build the scrubber. NERA Testimony, Day 6 Late PM 49:2-11; Exh 24-12,14a and 14b. The only two scenarios that found the scrubber more economic than market purchases relied upon NERA's low environmental case, which did not include any costs associated with potential carbon legislation or any costs associated with installing a cooling water tower. NERA Testimony, Day 6 Late PM 50:15-51:6.

Therefore, even before this Commission contemplates the differences between the Stanton and NERA testimony, it must find that the evidence unequivocally finds that it would have been more prudent for PSNH to purchase energy from the market than to install the scrubber in March of 2009.

⁴ As shown in Exhibit 20-7, at Merrimack's 2008 capacity factor of 72 percent, four out of five scenarios resulted in negative net benefits for ratepayers. The only scenario in which building the scrubber resulted in positive net benefits for ratepayers was one in which gas prices were high (resulting in high energy replacement costs for PSNH in the Merrimack retirement case) and environmental control requirements were low (resulting in low capital addition costs for PSNH in the continued operation of Merrimack case). Under those conditions, net benefits to ratepayers would be expected as long as the Merrimack's capacity factor did not drop below 60 percent. Because both of those conditions were unlikely, a reasonable and prudent utility manager would have concluded that it was more likely than not that constructing the scrubber would result in net costs, and not net benefits, to ratepayers. Exh 20: Stanton Prefiled Testimony at 14-15.

ii. This Commission should disregard evidence comparing the scrubber to building a natural gas plant because that alternative is neither a least-cost scenario or legally plausible scenario.

This Commission should not compare the costs of the scrubber to the costs of building a natural gas plant. First, the most logical alternative and in fact the only alternative readily available to PSNH would be to purchase energy from the market. See Large and Vancho Rebuttal Testimony, Day 6 PM 51:8-19. As Dr. Stanton testified, she compared the alternative of building the scrubber to purchasing energy on the market because that's the next alternative. PSNH operates in ISO-NE so if it's not operating, it's going to buy energy. Stanton Testimony, Day 4 AM 52:3-22. NERA likewise understood that PSNH would purchase energy from the market. NERA Testimony, Day 6 Late PM 22:4-11.

Second, as NERA confirmed, economic principals dictate comparing the cost of building the scrubber to the least cost alternative. NERA Testimony, Day 6 Late PM 26:17-27:2. As Dr. Harrison explained, you want to look at plausible alternatives that are relatively low cost. NERA Testimony, Day 6 Late PM 27:10-19. In every scenario created by NERA, purchasing energy from the market cost far less than building a gas plant. See Exh 24-12, 24-14a and 24-14b incorporated herein. In fact, in eleven of twelve scenarios even building the scrubber cost less than building a natural gas plant. NERA Testimony, Day 6 Late PM 49:2-11, See e.g. Exh 24-14a and Exh 24-14b.

As Exhibit 24-12 below summarizes, even accepting all of NERA's assumptions, it still would have cost less to purchase power than to build either the scrubber or a natural gas plant.

**Present Value of Cost Savings of Scrubber Project versus Alternatives
(2013-2027, millions of nominal dollars)**

Summer 2008		vs Natural Gas Plant			vs Market Purchases					
Short-term Prices =>		EIA Forecast	Futures	Futures	EIA Forecast	Futures	Futures			
Long-term Prices =>		EIA Forecast	EIA Forecast	Futures / Inflation	EIA Forecast	EIA Forecast	Futures / Inflation			
NG Plant Costs => Environ. Costs =>	Low	High	High	High	(\$164)	\$33	\$388			
	High	High	High	High				(\$396)	(\$207)	\$285
	Low	Low	Low	Low	(\$14)	\$210	\$824			
	High	Low	Low	Low				(\$32)	\$223	\$882
					\$347	\$571	\$1,184			

Spring 2009		vs Natural Gas Plant			vs Market Purchases					
Short-term Prices =>		EIA Forecast	Futures	Futures	EIA Forecast	Futures	Futures			
Long-term Prices =>		EIA Forecast	EIA Forecast	Futures / Inflation	EIA Forecast	EIA Forecast	Futures / Inflation			
NG Plant Costs => Environ. Costs =>	Low	High	High	High	\$55	\$68	(\$297)			
	High	High	High	High				(\$144)	(\$149)	(\$642)
	Low	Low	Low	Low	\$415	\$428	\$63			
	High	Low	Low	Low	\$202	\$299	\$158			
					\$562	\$659	\$519	\$104	\$185	(\$15)

Notes:
Positive values indicate the Scrubber Project was the lower-cost alternative.
All figures are present values as of 2013, calculated using a nominal discount rate of 9.61% (based on information provided by PSNH)
Short-term Prices are electricity and fuel prices based on EIA forecasts (with and without a federal CO₂ allowance price in "High" and "Low" env. cost cases, respectively) and two years of futures market prices.
Long-term Prices are electricity and natural gas prices based on U.S. EIA forecasts (differing by env. cost case) and futures market prices for the longest available contract and rising at the rate of inflation thereafter.
Natural Gas Plant Costs: "Low"=\$800/kW; "High"=\$1500/kW; approximate range identified by FERC in 2008.
Environmental Costs: "High" includes CO₂ allowance prices and free allowances from cap-and-trade proposals (and subsequent energy price effects) and costs of 316(b) regulations; "Low" includes RGGI CO₂ prices; both "High" and "Low" cases include minor expected costs associated with other environmental regulations.

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Exhibits 24-14a and 24-14b provide the underlying figures that support Exhibit 24-12.

Costs of Merrimack Station Scrubber Project Versus Alternatives as of Early-2009 (1 of 2)

	NERA Scenarios					
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Assumptions						
Short-Term Prices	EIA W/M Bill ¹	EIA W/M Bill ¹	AEO 2009 ²	AEO 2009 ²	Futures ³	Futures ³
Long-Term Prices	EIA W/M Bill ¹	EIA W/M Bill ¹	AEO 2009 ²	AEO 2009 ²	EIA W/M Bill Prices ⁴	EIA W/M Bill Prices ⁴
Environmental Costs	High ⁵	High ⁵	Low ⁷	Low ⁷	High ⁵	High ⁵
Natural Gas Plant Costs ⁸	\$800 / kW	\$1500 / kW	\$800 / kW	\$1500 / kW	\$800 / kW	\$1500 / kW
Capacity Factor ⁹	83%	83%	83%	83%	83%	83%
Net Present Values of Costs of Alternatives from 2013 to 2027 (millions of dollars)						
Scrubber Project Case:						
Non-Fuel O&M ⁹		\$339		\$339		\$339
Additional Environmental O&M ¹⁰		\$115		\$64		\$115
Allowances (net of free allocation) ¹¹		\$683		\$163		\$683
Fuel Expenses ⁹		\$876		\$905		\$876
Property Tax ¹²		\$26		\$26		\$26
Depreciation Expense ¹³		\$316		\$274		\$316
Total Expenses		\$2,356		\$1,770		\$2,356
Return on Rate Base ¹⁴		\$333		\$291		\$333
Total Revenue Requirements		\$2,689		\$2,061		\$2,689
Natural Gas Plant Case:						
Non-Fuel O&M ¹⁵	\$117	\$117	\$117	\$117	\$117	\$117
Allowances (net of free allocation) ¹¹	\$219	\$219	\$47	\$47	\$219	\$219
Fuel Expenses ¹⁵	\$1,878	\$1,878	\$1,569	\$1,569	\$1,891	\$1,891
Property Tax ¹²	\$75	\$141	\$75	\$141	\$75	\$141
Depreciation Expense ¹³	\$99	\$186	\$99	\$186	\$99	\$186
Total Expenses	\$2,388	\$2,540	\$1,908	\$2,060	\$2,401	\$2,553
Return on Rate Base ¹⁴	\$238	\$446	\$238	\$446	\$238	\$446
Sunk Costs ¹⁶	\$117	\$117	\$117	\$117	\$117	\$117
Total Revenue Requirements	\$2,743	\$3,104	\$2,263	\$2,623	\$2,756	\$3,117
Net Benefits of Scrubber Project: vs. Natural Gas Plant Alternative						
	\$65	\$415	\$202	\$562	\$68	\$428
Market Purchase Case:						
Wholesale Electricity Cost		\$2,427		\$2,047		\$2,422
Sunk Costs ¹⁶		\$117		\$117		\$117
Total Costs		\$2,544		\$2,165		\$2,540
Net Benefits of Scrubber Project: vs. Market Purchase Alternative						
		(\$144)		\$104		(\$149)

Notes:

- Rate of inflation is assumed to be 2.5 percent annually.
- Net present values calculated as of January 1, 2013 using a nominal discount rate of 9.61 percent and assuming costs occur at the end of each year.
- Scrubber construction costs (\$457 million) and schedule per PSNH.
- ¹ Prices from EIA modeling of Waxman-Markey Bill, which proposed (in early-2009) a CO2 cap-and-trade program (NEMS regional output with 2007 NH vs New England electricity price adjustment).
- ² Prices from the Updated Reference Case of AEO 2009 published in April 2009, NEMS regional output with NH vs New England electricity price adjustment.
- ³ Prices from NYMEX futures contracts for the ISONE energy market and Henry Hub available in March 2009; capacity market and gas transportation adders per PSNH, electricity prices adjusted to New Hampshire based on ISONE 2007 prices.
- ⁴ Futures prices used in 2010 and 2011; EIA forecast prices used after 2020; for 2012 through 2019, straight-line method used to extrapolate prices between sources.
- ⁵ Futures market data used when available; for periods with no futures market data, prices are assumed to increase at the rate of inflation.
- ⁶ CO2 allowance prices from EIA modeling of the Waxman-Markey Bill, adjusted for freely distributed allowances; energy prices adjusted to reflect EIA projections; projected cost of cooling water intake structure regulations assuming cooling towers at Merrimack Station (per ENERCON from NERA 2011 study).
- ⁷ CO2 allowance prices from NYMEX futures for RGGI available in March 2009.
- ⁸ Natural gas plant capital cost based on the approximate range of natural gas plant costs cited by FERC in June 2008.
- ⁹ Average of 2003-2007 historical data (provided by PSNH) for Merrimack Station; fuel and O&M costs assumed to increase at rate of inflation.
- ¹⁰ Includes costs related to the Scrubber Project (per PSNH) and costs related to cooling water intake structure regulations (per ENERCON from NERA 2011 study).
- ¹¹ For "High Environmental Cost" scenarios, free allocation of CO2 allowances decrease from roughly 50 to 25 percent of plant emissions between 2013 and 2027, per Lieberman-Warner Bill proposal; SO2 and NOx allowances prices from NYMEX futures contracts available in March 2009.
- ¹² Projected Merrimack Station property tax payments per PSNH; pollution control equipment is exempt from property tax per New Hampshire law, natural gas plant property tax payments assumed to be 2.53% of plant value (includes local and state tax rates).
- ¹³ Assumes 15-year straight-line depreciation of all incremental capital costs related to the Scrubber Project; assumes 30-year straight-line depreciation for the natural gas plant (per PSNH).
- ¹⁴ Assumes a rate of return of 10.87 percent of rate base per PSNH; tax depreciation based on 20-year MACRS schedule for natural gas plant and 15-year straight-line schedule for incremental capital at Merrimack Station.
- ¹⁵ Operating costs of a combined-cycle natural gas plant are based on information from EIA's Assumptions to the Annual Energy Outlook 2009 report.
- ¹⁶ Includes costs of cancelling Scrubber Project as of April 1, 2009 (per PSNH), amortized over 2013-2027; excludes any "stranded" costs (non-incremental capital costs) upon retirement of Merrimack Station.

Costs of Merrimack Station Scrubber Project Versus Alternatives as of Early-2009 (2 of 2)

	NERA Scenarios					
	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	Scenario 12
Assumptions						
Short-Term Prices	Futures ³	Futures ³	Futures ³	Futures ³	Futures ³	Futures ³
Long-Term Prices	AEO 2009 Prices ⁴	AEO 2009 Prices ⁴	Rate of Inflation ⁵			
Environmental Costs	Low ⁷	Low ⁷	High ⁸	High ⁸	Low ⁷	Low ⁷
Natural Gas Plant Costs ⁹	\$800 / kW	\$1500 / kW	\$800 / kW	\$1500 / kW	\$800 / kW	\$1500 / kW
Capacity Factor ⁹	83%	83%	83%	83%	83%	83%
Net Present Values of Costs of Alternatives from 2013 to 2027 (millions of dollars)						
Scrubber Project Case:						
Non-Fuel O&M ⁹		\$339		\$339		\$339
Additional Environmental O&M ¹⁰		\$64		\$115		\$64
Allowances (net of free allocation) ¹¹		\$163		\$683		\$163
Fuel Expenses ⁹		\$905		\$876		\$905
Property Tax ¹²		\$26		\$26		\$26
Depreciation Expense ¹³		\$274		\$316		\$274
Total Expenses		\$1,770		\$2,356		\$1,770
Return on Rate Base ¹⁴		\$291		\$333		\$291
Total Revenue Requirements		\$2,061		\$2,689		\$2,061
Natural Gas Plant Case:						
Non-Fuel O&M ¹⁵	\$117	\$117	\$117	\$117	\$117	\$117
Allowances (net of free allocation) ¹¹	\$47	\$47	\$219	\$219	\$47	\$47
Fuel Expenses ¹⁶	\$1,667	\$1,667	\$1,526	\$1,526	\$1,526	\$1,526
Property Tax ¹²	\$75	\$141	\$75	\$141	\$75	\$141
Depreciation Expense ¹³	\$99	\$186	\$99	\$186	\$99	\$186
Total Expenses	\$2,005	\$2,157	\$2,036	\$2,189	\$1,864	\$2,017
Return on Rate Base ¹⁴	\$238	\$446	\$238	\$446	\$238	\$446
Sunk Costs ¹⁶	\$117	\$117	\$117	\$117	\$117	\$117
Total Revenue Requirements	\$2,360	\$2,720	\$2,391	\$2,752	\$2,220	\$2,580
Net Benefits of Scrubber Project: vs. Natural Gas Plant Alternative	\$299	\$659	(\$297)	\$63	\$158	\$519
Market Purchase Case:						
Wholesale Electricity Cost		\$2,129		\$1,929		\$1,929
Sunk Costs ¹⁶		\$117		\$117		\$117
Total Costs		\$2,247		\$2,046		\$2,046
Net Benefits of Scrubber Project: vs. Market Purchase Alternative		\$185		(\$642)		(\$15)

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- ² Prices from the Updated Reference Case of AEO 2009 published in April 2009, NEMS regional output with NH vs New England electricity price adjustment.
- ³ Prices from NYMEX futures contracts for the ISONE energy market and Henry Hub available in March 2009; capacity market and gas transportation adders per PSNH; electricity prices adjusted to New Hampshire based on ISONE 2007 prices.
- ⁴ Futures prices used in 2010 and 2011; EIA forecast prices used after 2010, for 2012 through 2019, straight-line method used to extrapolate prices between sources.
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- ⁷ CO2 allowance prices from NYMEX futures for RGGI available in March 2009.
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- ¹⁰ Includes costs related to the Scrubber Project (per PSNH) and costs related to cooling water intake structure regulations (per ENERCON from NERA 2011 study).
- ¹¹ For "High Environmental Cost" scenarios, free allocation of CO2 allowances decrease from roughly 50 to 25 percent of plant emissions between 2013 and 2027, per Lieberman-Warner Bill proposal; SO2 and NOx allowances prices from NYMEX futures contracts available in March 2009.
- ¹² Projected Merrimack Station property tax payments per PSNH; pollution control equipment is exempt from property tax per New Hampshire law; natural gas plant property tax payments assumed to be 2.53% of plant value (includes local and state tax rates).
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- ¹⁵ Operating costs of a combined-cycle natural gas plant are based on information from EIA's Assumptions to the Annual Energy Outlook 2009 report.
- ¹⁶ Includes costs of cancelling Scrubber Project as of April 1, 2009 (per PSNH), amortized over 2013-2027; excludes any "stranded" costs (non-incremental capital costs) upon retirement of Merrimack Station.

The arrows in the margin point to the columns that reflect the total revenue requirements as calculated by NERA for the scrubber project, the natural gas plant case, and the market purchase case. In comparing those columns, the market purchase case is always the least cost alternative when compared to the natural gas plant case.

Clearly, from a purely economic point of view and accord with all of the expert testimony at hearing, the prudent alternative was to purchase energy from the market rather than build the scrubber in March of 2009.

In addition, this Commission should disregard the natural gas plant case because it presents a legally implausible scenario. NERA assumed that PSNH could develop a natural gas facility. NERA Testimony, Day 6 Late PM 18:2-21, and did not look into legal or administrative issues, NERA Testimony, Day 6 Late PM 17:9-11.⁵ As NERA explained: “Solely for purposes of our analysis, we make the assumption that PSNH had the discretion to go forward with the Scrubber Project as well as to develop a natural gas facility or to rely upon market purchases.” Id.; see also NERA Testimony, Day 6 Late PM 17:9-14. In fact, neither Dr. Harrison nor Dr. Kaufman knew that the law prevented PSNH from building a new generation facility. NERA Testimony, Day 6 Late PM 20:3-10. Dr. Harrison has no recollection of anyone ever telling him that PSNH could not build a natural gas facility. NERA Testimony, Day 6 Late PM 21:1-4.

Of course, PSNH cannot build new generation. Franz Testimony, Day 2 AM: 115:21-116:1-. Therefore PSNH testified that it contemplated a cost-of-service merchant plant with which PSNH would contract to purchase power. Large and Vancho Testimony, Day 6 PM 47:19-48:5. PSNH estimated this process would take six to eight years, and that they would need to

⁵ Nor did NERA testify “about prudence in any way.” NERA Testimony, Day 6 Late PM 23:22-24.

purchase power from the market in the interim. Large and Vancho Rebuttal Testimony, Day 6 PM 51:8-19. This contemplated “cost-of-service merchant plant” does not have a clear and easy legal basis. The closest analogy to what PSNH is proposing is the Berlin Biogas PPA. On July 26, 2010, PSNH petitioned the PUC to approve a PPA with Laidlaw Berlin BioPower, LLC (Berlin) to acquire “100%” of the plant’s “Products” (as defined in Article 1), including energy, capacity, and renewable energy certificates (RECs). DE 10-195, Order No. 25,213, 1, 9-10. The Berlin biogas plant qualifies for renewable energy certificates and thereby assists the state in achieving its statutory RPS requirements under RSA 374-F, which promotes long-term contracts for renewable energy projects. From the perspective of early 2009, the proposed natural gas plant would not serve the public interest by promoting the use of renewable energy and would be more expensive to rate payers than purchasing energy from the market. Therefore, it is unlikely that this Commission would have made in public interest finding in favor of such a project in 2009.

iii. Dr. Stanton’s analysis is better supported by information actually available in early 2009 than NERA’s analysis.

PSNH quibbled with several details underlying Dr. Stanton’s analysis. The major differences between NERA’s assumptions and Stanton’s assumptions stem from differences in how they accounted for potential future costs of complying with reasonably foreseeable environmental regulations.

Like the other experts in this docket, Drs. Harrison and Kaufman opined that costs associated with future environmental requirements must be factored into the analysis of whether to proceed with a major capital improvement in the first quarter of 2009. NERA testimony, Day 6 Late PM 28:10-17. For example, Dr. Sahu, an expert with over two decades of experience in the field of environmental engineering and consulting, testified that it would have been

imprudent to build the scrubber, in light of significant additional capital expenditures needed to comply with other environmental regulations at Merrimack Station. Sahu Testimony, Day 3 PM 6:3-8; Exh 19: Sahu Prefiled Testimony at 1-2 and Exh 19-1:Resume. His testimony highlighted potential air quality regulations, water quality regulations and, climate-related regulations reasonably foreseeable in 2008. Sahu Prefiled Testimony at 3, 5-10.

a. Stanton's assumptions regarding future carbon regulations are more credible.

Both NERA and Dr. Stanton considered costs related to CO₂ emissions as an important variable in their analysis. See e.g. NERA testimony, Day 6 Late PM 28:18-23(one of those costs is the CO₂ prices or costs related to CO₂ emissions); Stanton testimony, Day 4 AM 46:1-18 (describing her CO₂ pricing assumptions). With respect to her CO₂ pricing assumptions, Dr. Stanton used carbon pricing from the Synapse 2008 Carbon Price Forecast, which was widely used throughout industry, by utilities, and by public utility commissions nation-wide in 2008 and 2009. In fact, it was used by stakeholders in the AESC process, including PSNH, its parent company, and the NH Public Utilities Commission. Day 4 AM 46:1-18; see also Exh 80. The Synapse forecast is frequently updated and, among other factors, contemplates pending legislation, reference points like the CO₂ prices used by utilities, publicly available information from utilities, and the costs of reducing CO₂- called marginal weight abatement cost. Synapse then exercises its professional judgment to distill high, medium and low carbon prices. Stanton Testimony, Day 4 AM 50:13-51:3.

Rather than relying upon a forecast or model in existence in 2008 or 2009, NERA created its own retrospective model.⁶ Its low environmental cost case continued RGGI pricing but added no amounts to account for costs of possible future carbon legislation. It used a RGGI price for 2012 of \$4 in nominal terms. Stanton Testimony, Day 4 AM 47:18-48:1; Exh 24: NERA prefiled testimony at 16; Exh 24-12 and Exh 24-15. PSNH's own economic analysis, conducted in the summer of 2008, assumed a RGGI or CO2 allowance cost of \$7 per ton escalated at 2.5% per year for the period of the analysis. Exh 27-9: PSNH report to PUC in DE 08-103 at 14.

Moreover, in early 2009, there were several bills pending that would have imposed additional costs associated with carbon pollution. NERA testimony, Day 6 Late PM 35:22-36:1. The Synapse forecast listed nine bills under consideration by Congress. Exh 80 at 8, Table 1. These "major legislative proposals...would require far more substantial reductions in greenhouse gas emissions" than current emissions levels. Exh 80 at 9 (see also Figure 1: comparing CO2 reductions required by each bill). The general trend in 2008 clearly showed that "it would be a mistake in long-term decisions concerning electric resources" to ignore the trend toward more stringent carbon regulation. Exh 80 at 10. NERA's low environmental cost case makes this mistake and fails to account for future more stringent carbon regulation.

NERA's high environmental cost case also contains flawed carbon cost assumptions. NERA relied upon EIA modeling of the Waxman-Markey federal climate bill and then created their own assumption regarding presumed free allowances that might be given to Merrimack Station. Stanton Testimony, Day 4 AM 48:14-20, NERA testimony, Day 6 Late PM 32:24-33:9

⁶ The Synapse Report lists some of the large number of modeling analyses that had been undertaken to evaluate the CO2 allowance prices that would result from the major climate change bills introduced in the current Congress. Id. at 11. As an example, the report lists 14 models available for use in 2008-2009. Id. at 11-12.

(Waxman-Markey Bill had provisions for free allowances, and NERA extrapolated from that what they thought would apply to Merrimack Station). There are several flaws with NERA's high carbon price model.

First, the information they relied upon would not have been available to utility managers in late 2008-early 2009. Representative Waxman, introduced the American Clean Energy and Security Act, also known as the Waxman-Markey bill on May 15, 2009. See e.g. <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:H.R.2454>. EIA published its report of the potential impacts of H.R. 2454 in August 2009. Exh 125. In fact, Dr. Harrison's best guess is that the underlying data NERA relied upon was available in August 2009. NERA testimony, Day 6 Late PM 29:20-30:5. Therefore neither piece of information was available before construction of the scrubber.

Second, the modeling done by NERA ignores all existing, published modeling and the many bills actually being considered by Congress during 2008 and early 2009. In 2009, a reasonable utility manager should have considered the totality of these factors. Stanton Testimony, Day 4 AM 77:20-78:3.

Third, as NERA stated repeatedly, they made assumptions for the purposes of analysis without regard to the probability of whether the assumption was likely to occur or legal. The prices assumed by NERA were about half the amount assumed in the Waxman-Markey basic run. Exh. 126; see also NERA testimony, Day 6 Late PM 31:7-32:13. Dr. Stanton explained that, the proposed Waxman-Markey bill worked by setting caps and giving away allowances, then reducing the number of allowances over time. Stanton Testimony, Day 4 AM 49:1-10. The price that EIA set was based on modeling of that bill in August of 2009. The price started at \$20 and

went up to \$50. Stanton Testimony, Day 4 AM 49:10-16. Harrison and Kaufman then adjusted the price downward by about \$10/year based on their estimate of free allowances. Stanton Testimony, Day 4 AM 49:17-24. Dr. Stanton believes that the free allowances were already built into the EIA model so there would be no need to adjust the price down. Stanton Testimony, Day 4 AM 49:24-50:4. See also Exh 125: EIA Modeling of Waxman-Markey (see e.g. executive summary which discusses modeling and offsets and Table ES-1 which lists offsets and allowances for seven different modeling scenarios of the bill in 2020 and 2030).

In contrast, NERA explained that they derived the 50% reduction by looking at the provisions of the Lieberman-Warner Bill, which they believed was similar to the Waxman-Markey Bill, and made judgments about what was likely to be the going-forward cost to PSNH for 2013 to 2027. Day 6 Late PM 34:1-35:5. The Lieberman-Warner Bill failed on June 6, 2008. https://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=110&session=2&vote=00145. Prudent analysis would have required a utility to look at more than ex-post-facto extrapolations from the Lieberman-Warner Bill and EIA Modeling of Waxman-Markey.

For these reasons, this Commission should disregard Exh 24-16, which uses the faulty NERA CO₂ price assumptions to change the outcome of Dr. Stanton's analysis and should find Dr. Stanton's CO₂ assumptions more reasonable. This is especially true given that her assumptions are based on a well-respected forecast widely relied upon by industry and public utility commissions, including PSNH and this Commission through the AESC process.

b. Stanton's assumptions regarding future water quality regulations are more credible.

Both Dr. Stanton and NERA considered the costs of complying with future water quality regulations in forming their environmental assumptions. In 2009, Merrimack Station operated on an extended NPDES permit; i.e. Merrimack Station's NPDES permit had expired and had been extended while the US EPA worked on updating the permit to include new controls and discharge limits. See Smagula Testimony, Day 1 AM, 24: 4-7. As part of the renewal process, EPA asked PSNH to evaluate the costs of adding draft cooling water towers for both units at Merrimack Station, various screening and fish return technologies, and technological and flow reduction measures. PSNH submitted its response to that request on December 10, 2007. See Exh. 127 at vi and 32-63. Moreover, at the time EPA had prepared a draft rule concerning cooling water intake structures. See <http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/> (Section 316(b) of Clean Water Act required EPA to issue regulations on design and operation of intake structures. EPA promulgated regulations in 2001, 2003, 2006 and 2014.)

Dr. Stanton's based her assumptions regarding the costs PSNH might face with respect to 316(b) and the renewal of Merrimack Station's NPDES permit, on the EPA rule in draft at the time. She set low, medium, and high cases based on the least to most stringent controls EPA might have imposed on Merrimack Station in accord with its draft rule. Stanton Testimony, Day 4 AM 51:4-21.

In contrast, NERA created a low environmental cost case with no costs associated with complying with 316(b) regulations, and therefore no costs associated with installing a cooling water tower. NERA Testimony, Day 6 Late PM, 39:24-40:2; Exh 24-12, Exh 24-14a n. 6 and

14b n.6. Its high environmental case contemplated costs associated with installing a cooling water tower, Exh 24-14a n. 6 and 24-14b n.6., but the exact estimate is not in NERA's testimony and Dr. Harrison could not recall how much NERA allocated for a cooling water tower. NERA Testimony, Day 6 Late PM, 40:3-12. Instead NERA's high environmental case allocates \$115million as the net present value necessary to comply with *all* future environmental O& M.. NERA Testimony, Day 6 Late PM 52:2-16.

To begin with, this Commission should disregard NERA's low environmental cost case assumption. As NERA admitted, given the pending NPDES permit, it was "pretty likely" that PSNH would be required to build a cooling water tower at Merrimack Station. NERA Testimony, Day 6 Late PM 43:23-44:4. Moreover NERA admitted that it just made assumptions for purposes of economic analysis and is expressing no opinion regarding whether a cooling water tower would be likely or not at Merrimack Station. Day 6 Late PM 45:2-7. The weight of the evidence at hearing clearly supports a finding that a prudent utility would have considered the costs of installing cooling water towers and associated water pollution control technology in its analysis of whether to build the scrubber.

Furthermore, the estimate for constructing cooling water towers provided by PSNH to EPA in late 2007 totalled \$67,980,500. NERA testimony, Day 6 Late PM 43:13-22: Exh. 127 at 43; see also Exh 89: Fact Sheet: (estimating \$118 million to install closed cycle cooling). In addition PSNH calculated O & M costs associated with support of the cooling towers to be \$125,500 annually. Exh. 127 at 47. Therefore PSNH's estimates associated with cooling water costs alone outstrip NERA's high environmental O & M cost estimate.

For all of the above reasons, the Commission should find Dr. Stanton's environmental cost cases to be more credible than NERA's environmental cost cases.

III. What amounts should PSNH recover as prudent costs?

Based on information provided by PSNH, Dr. Stanton opined that PSNH should be entitled to recover the \$23 million that they spent prior to 2009 plus penalties for cancellation as prudent costs. Dr. Stanton could not calculate the penalties for cancellation because PSNH did not provide that information until after she completed and submitted her testimony. Stanton Testimony, Day 4 AM 96:20-97:12; Exh 28: March 28, 2014 Clean Air Project: Development of Costs Associated with a CAP Cancellation Scenario. PSNH first calculated potential cancellation costs in March of 2014, after all of the other parties had submitted their testimony in this case. See Exh 28. According to PSNH's calculations, in March of 2009 it would have cost approximately \$128 million to cancel the scrubber. Smagula Testimony, Day 1 AM 74:18-20. Of that, PSNH attributed \$ 45 million as invoiced, \$ 21 million as anticipated, \$39 million as costs, and \$ 22 million as site rehabilitation. Smagula Testimony, Day 1 AM 74:21-75:1.

Given the timing of this evidence, the Commission should carefully examine it or allow further proceedings to further examine PSNH's cancellation analysis. At a minimum, this Commission should consider \$ 128 million as the maximum allowable amount that PSNH can recover and \$23 million as the minimum amount. From the maximum amount, based on the evidence at hearing, this Commission should consider subtracting all unnecessary expenses, like those related to truck washing and secondary sewage wastewater treatment, as well as any other costs not reasonably related to penalties associated with contract cancellation as of March 2009.

IV. Conclusion

For all of the above reasons, this Commission should find that PSNH acted imprudently when it ignored the law and this Commission's Orders and therefore failed to conduct thorough economic analysis before commencing major construction of the scrubber in March of 2009. The Commission should further find that if had PSNH conducted economic analysis during that time frame it would have determined that installing the scrubber was imprudent and uneconomic. It could have presented that information to the legislature and to this Commission for further consideration and action. Therefore this Commission should disallow all costs associated with the scrubber and incurred after March of 2009. It should permit recovery only of the \$23 million that PSNH had actually spent at that time plus the penalties associated with contract cancellation.

Dated: November 14, 2014

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on the 14th day of November 2014, a copy of the foregoing Post-Hearing Brief was sent electronically to the service list.

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