

**STATE OF NEW JERSEY  
BOARD OF PUBLIC UTILITIES**

**IN THE MATTER OF THE PETITION OF  
PUBLIC SERVICE ELECTRIC & GAS COMPANY  
FOR APPROVAL OF THE SECOND ENERGY  
STRONG PROGRAM (ENERGY STRONG II)**

**BPU Docket Nos. EO18060629 and GO18060630**

**PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
REBUTTAL TESTIMONY  
OF  
WADE E. MILLER  
DIRECTOR – GAS TRANSMISSION AND  
DISTRIBUTION ENGINEERING**

**April 18, 2019**

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1                                   **PUBLIC SERVICE ELECTRIC AND GAS COMPANY**  
2                                   **REBUTTAL TESTIMONY**  
3                                   **OF**  
4                                   **WADE E. MILLER**  
5                                   **DIRECTOR – GAS TRANSMISSION AND DISTRIBUTION ENGINEERING**

6   **I.    INTRODUCTION**

7   **Q.    Please state your name and title.**

8   A.    My name is Wade E. Miller, and I am Director, Gas Transmission and Distribution  
9   (“T&D”) Engineering of Public Service Electric and Gas Company (“PSE&G”, or the  
10   “Company”), the Petitioner in this matter.

11   **Q.    Have you submitted testimony previously in this proceeding?**

12   A.    Yes, I submitted direct testimony in support of the Company’s Energy Strong II Program  
13   (the “Program” or “Energy Strong II”) as it relates to the natural gas delivery system.

14   **Q.    What is the purpose of your rebuttal testimony?**

15   A.    I offer the following testimony in response to the arguments raised in opposition to the  
16   Energy Strong II Program by the Division of Rate Counsel (“Rate Counsel”) witnesses Dr. David E.  
17   Dismukes and Mr. Edward A. McGee. Particularly, I explain how the Program is consistent with  
18   the Board of Public Utilities (“BPU” or the “Board”) regulation and policy, and why, as an  
19   overarching issue, the Energy Strong II gas projects should be approved as prudent in this  
20   proceeding. Additionally, I respond to the assertions and criticism of opposing witnesses  
21   regarding the elements of the gas portion of the Program.

22   **II.   IDENTIFICATION OF ATTACHMENTS**

23   **Q.    Do you sponsor any exhibits in support of your testimony?**

24   A.    Yes, I have attached the following two exhibits:

- 25           1. Exhibit WEM-ESII-1R is the Enbridge Delmont Map of April 30, 2016.
- 26           2. Exhibit WEM-ESII-2R is the Enbridge Firm Supply Map of December 10,  
27           2018.

1 **III. SUMMARY**

2 **Q. What are Dr. Dismukes and Mr. McGee’s recommendations with regard to the ESII**  
3 **gas program?**

4 A. Both Dr. Dismukes and Mr. McGee recommend the Board reject or modify the Program.  
5 With regard to the Curtailment Resiliency (“CR”) subprogram, Dr. Dismukes recommends  
6 rejection of the Program because in his view, it is beyond the scope of Energy Strong I and is not  
7 aligned with Board policy. Mr. McGee recommends the CR subprogram be rejected because 1)  
8 it is unlikely an event necessitating such a program will occur, 2) the proposed pipelines would  
9 seldom be used and thus not meet the regulatory test of being used and useful, 3) interstate  
10 pipelines have enough resiliency that the proposed projects are unneeded, and 4) trucked LNG  
11 could be used as an alternative to the Program.

12 With regard to the M&R Upgrade subprogram, Dr. Dismukes argues that the subprogram  
13 is not cost-beneficial, while Mr. McGee recommends only three of the seven proposed stations  
14 (Camden, East Rutherford, and Central) be included for rebuild. He proposes the remaining four  
15 stations be upgraded on an as-needed basis through base capital.

16 If all or a portion of the ESII Program is approved, Dr. Dismukes recommends the  
17 Company have performance metrics, inclusion of an O&M cost credit, and a cost and rate cap,  
18 while Mr. McGee recommends any investment in pipes larger than needed for the CR  
19 subprogram not be eligible for cost recovery.

1 **Q. Please summarize your key conclusions regarding the Direct Testimony of Mr.**  
2 **McGee and Dr. Dismukes.**

3 A. Based upon my review of the testimony submitted by Mr. McGee and Dr. Dismukes, my  
4 conclusions are as follows:

- 5 1. Contrary to Dr. Dismukes' claims, the Program is consistent with the IIP rule and Board  
6 policy and is in the scope of Energy Strong I.
- 7 2. While Rate Counsel witnesses assert that the Company has not shown a need for the  
8 curtailment resiliency subprogram, they ignore the recent significant incidents of gas  
9 curtailments and outages that have occurred in the country, and more relatedly, in  
10 PSE&G territory.
- 11 3. The proposed curtailment resiliency subprogram projects are designed appropriately and  
12 will be used and useful, assuming Board approval.
- 13 4. Mr. McGee's proposed alternative of trucking in Liquefied Natural Gas ("LNG") is not  
14 viable due to logistics, scale and technical complexity of the necessary operation in the  
15 event of an emergency.
- 16 5. Mr. McGee's claim that there is redundancy in interstate pipelines that can alleviate the  
17 need for the CR subprogram is unsupported and such "redundancy" does not exist during  
18 a winter period.
- 19 6. Mr. McGee's suggestion that there is no sense of urgency to upgrade Metering and  
20 Regulation ("M&R") stations, and that the Company can upgrade them on an as needed  
21 basis, is based on an old paradigm that cuts against the purpose of the IIP rule.
- 22 7. While the IIP rule does not require performance metrics as Dr. Dismukes suggests, we  
23 will work with the Board to develop appropriate metrics and herein I will provide some  
24 recommendations.

1 The Company's Cost Benefit Analysis ("CBA") panel will show the Company's gas program  
2 is beneficial while Company witness Stephen Swetz will address the inclusion of an O&M offset  
3 and the proposed cost and rate caps.

4 **IV. RESPONSE TO SPECIFIC ISSUES RAISED BY RATE COUNSEL**

5 **A. THE CURTAILMENT RESILIENCY SUBPROGRAM IS CONSISTENT WITH**  
6 **THE BOARD'S POLICY TO FACILITATE INFRASTRUCTURE AND IN**  
7 **SCOPE WITH ENERGY STRONG I**

8 **Q. Dr. Dismukes states that the CR subprogram is "not consistent with the Board's**  
9 **overarching policy goals of facilitating the development of infrastructure dedicated**  
10 **exclusively to resiliency, reliability, and storm preparedness". (Dr. Dismukes**  
11 **testimony, at page 42). Do you agree?**

12 A. No, I do not. The Board has demonstrated its policy of facilitating investment in  
13 infrastructure by: 1) enacting the IIP regulation with the intent to promote, support and facilitate  
14 the accelerated development of infrastructure dedicated to resiliency, reliability, and safety, and  
15 2) approving several significant infrastructure programs proposed and conducted by PSE&G,  
16 and by other New Jersey energy utilities. Energy Strong II, and specifically the CR subprogram,  
17 aligns with the parameters of the BPU's IIP regulation as the projects proposed in Energy Strong  
18 II will make the gas delivery system more resilient and reliable, including by addressing gas  
19 supply problems that are of particular concern in recent times around the country, and more  
20 particularly in PSE&G's territory.

21 **Q. Has the Board shown any concern for a potential pipeline failure in the winter,**  
22 **which the CR subprogram is designed to address?**

23 A. Yes, it has. As noted in my direct testimony at page 7, the BPU Division of Reliability &  
24 Security sponsored a table-top exercise of a winter pipeline failure scenario called the NJ Pilot  
25 Light Exercise in June 2017. This exercise was attended by the NJ gas distribution companies,  
26 the Texas Eastern Transmission Company, and the NJ Office of Homeland Security and  
27 Preparedness. The focus of the exercise was on emergency response actions, operational

1 coordination and information sharing among the participants during an immediate incident.  
2 What became apparent at the conclusion of this exercise was that major interstate pipeline  
3 curtailments could have significant lasting effects. One of the takeaways from the exercise,  
4 noted as an area of improvement, was the need for more diverse gas supplies and interconnection  
5 to multiple interstate sources.

6 **Q. Is the Board continuing to review this potential threat?**

7 A. Yes. This dialogue surrounding the issue of incident response and gas curtailments is  
8 something that continued this year and is expected to culminate in an additional pipeline failure  
9 scenario exercise. This is clearly an issue of importance to the Board's Staff. Accordingly,  
10 PSE&G has taken the NJ Pilot Light exercise and the continuing dialogue with Staff to heart and  
11 has designed a gas curtailment resiliency program for Energy Strong II that is not only in line  
12 with the IIP regulation, but also with the Board's policy and initiatives.

13 **Q. Dr. Dismukes also states that the CR subprogram is "clearly outside of the scope of**  
14 **the Board's approval of Energy Strong I". (Dr. Dismukes testimony, at page 42). Do**  
15 **you agree?**

16 A. No, I do not. The Energy Strong I gas program hardened gas infrastructure against a  
17 major exogenous event (storm surge and flooding) with the intent to reduce or eliminate the  
18 potential for customer outages if the same type of event occurred again. The Energy Strong II  
19 Curtailment Resiliency sub-program is a series of projects designed to accomplish the very same  
20 thing for a different type of exogenous event, namely an interstate pipeline supply curtailment.  
21 In the aftermath of Superstorm Sandy and Hurricane Irene, the Company faced 6,000 – 10,000  
22 gas customer outages due to water infiltration. A pipeline supply curtailment event can take  
23 place every bit as rapidly as a flooding event and has the potential for a far greater number of gas  
24 customer outages. I believe that for this reason, the Curtailment Resiliency projects emphatically  
25 support the Board's expressed policy goals.

1 **Q. Is the M&R Upgrade subprogram consistent with Energy Strong I and Board**  
2 **policy?**

3 A. Yes, the M&R Station Upgrade subprogram also supports the Board’s policy goals of  
4 resiliency and reliability. Two of the proposed upgrades are stations that are located in FEMA  
5 designated flood zones and they will be hardened in the same manner as M&R stations were  
6 hardened in the Energy Strong I program. All of the stations in the subprogram, are at or near  
7 the end of their life cycles, and will be upgraded to current design standards, improving  
8 reliability and reducing the potential for a large volume release of methane, a potent greenhouse  
9 gas.

10 **B. A TRANSMISSION PIPELINE CURTAILMENT IS A VERY REAL THREAT**  
11 **AND HAS HAPPENED IN PSE&G’S SERVICE TERRITORY ALREADY**

12 **Q. Mr. McGee states, “It is not sound business practice to invest significant amounts of**  
13 **capital to protect against an emergency of unknown likelihood. (See page 9 of Mr.**  
14 **McGee’s testimony). Do you agree?**

15 A. No, I do not. As utility planners, we are not experts at predicting weather, or at  
16 predicting the occurrence of inherently unpredictable events. Nevertheless, we do not believe  
17 that the essential facts are in dispute, or reasonably can be disputed; an event similar in type and  
18 scope to the event that did in fact occur on the Enbridge system in Pennsylvania near the  
19 Delmont compressor station in April 2016, occurring in December, January, or February, could  
20 result in significant hardship, that could effectively be mitigated by the Energy Strong II  
21 Curtailment Resiliency program.

22 **Q. What is Mr. McGee’s response to the curtailment that occurred on the Enbridge**  
23 **system in Pennsylvania in April 2016?**

24 A. On page 7 of Mr. McGee’s testimony he references a statement from a Pittsburgh Post-  
25 Gazette article made by an Interstate Natural Gas Association of America (“INGAA”)  
26 spokeswoman in response to the 2016 rupture of the Texas Eastern pipeline near Delmont

1 compressor station that “Nearly 100 percent (99.999997 percent to be exact) of the natural gas  
2 transported by pipeline was delivered without incident last year” to seemingly support the  
3 proposition that gas supply shortages rarely, if ever occur. He further references her statement  
4 that “Our industry is committed to the goal of zero incidents, and we are working every day in  
5 pursuit of that goal.”

6 **Q. Do you agree with Mr. McGee’s supposition based on the article?**

7 A. No, I do not. While not all incidents result in a curtailment of gas deliveries, some do.  
8 The Texas Eastern incident at Delmont, and the incidents in Southern California and Texas,  
9 detailed in my direct testimony at pages 3-7, are recent examples of significant events that  
10 resulted in capacity reductions and gas curtailments. These incidents—in particular the Delmont  
11 incident that affected service to PSE&G’s service territory—must be put in proper perspective.  
12 It is true that no outages resulted from the Texas Eastern incident at Delmont, however, what Mr.  
13 McGee ignores is what could have and would have happened had the force majeure/curtailment  
14 been implemented during the winter season when gas usage is at its peak. Instead Mr. McGee  
15 has formed an opinion of the benefit (or lack thereof) of the curtailment resiliency program based  
16 on a very myopic view of gas supply and curtailment issues.

17 **Q. Does the spokeswoman for INGAA’s statement that it is committed to the goal of**  
18 **zero incidents alleviate the need for the CR subprogram?**

19 A. No, it does not. Although the gas transmission pipeline industry is committed to the goal  
20 of zero pipeline incidents according to INGAA, based on DOT statistics that has not been  
21 achievable. In fact, the article mentioned above also states there have been 62 incidents on  
22 Texas Eastern system in the past 30 years. As one of the Company’s two largest suppliers, it is  
23 an outage on the Texas Eastern system that the Curtailment Resiliency program is mainly  
24 designed to address but the projects also provide resiliency to a Tennessee system curtailment

1 and the supplemental LNG Facility will provide resiliency to a Transco system curtailment as  
2 well.

3 **Q. Apart from the local Board’s concern about natural gas curtailments mentioned**  
4 **above, has this been an issue of concern at a broader or national level?**

5 A. Yes, this is a real concern for the Pipeline and Hazardous Materials Safety  
6 Administration (“PHMSA”). In a February 14, 2019 article published by S&P Global, Paul  
7 Roberti, general counsel for the U.S. Pipeline and Hazardous Materials Safety Administration,  
8 shared concerns of customer access to supply during cold spells at a National Association of  
9 Regulatory Utility Commissioners (“NARUC”) panel discussion in Washington D.C. Roberti  
10 noted January gas outages in Minnesota and Rhode Island and a compressor station fire in  
11 Michigan that temporarily threatened customers' gas access during a particularly severe cold  
12 spell. He particularly cited no margin for error whatsoever during periods of cold weather and  
13 that recent events demonstrate that we need more pipelines, we need better planning, and we  
14 need more investment in system redundancy because more people, more power generators and  
15 the economy in general have an ever-growing dependence on natural gas infrastructure. It was  
16 written in the article that he likened energy system outages to other safety incidents, noting that a  
17 2003 blackout contributed to eight fatalities.

18 **Q. At pages 9-10 of his testimony, Mr. McGee claims that the proposed pipeline**  
19 **extensions “will have very little usage or need,” and presents an estimate of the**  
20 **occurrence and consequential usage of any of the extensions. Do you agree with Mr.**  
21 **McGee’s claim and estimation?**

22 A. No. Mr. McGee’s assertion that the Company’s curtailment resiliency program “will have  
23 very little usage or need” is inconsistent with recent history and current experience. In 2019 two  
24 incidents have occurred, both on Enbridge owned transmission lines, with one resulting in  
25 curtailment of gas services by the local distribution company. On January 22, 2019, a 30-inch  
26 transmission line exploded in Noble County, OH requiring depressurization of affected lines. In

1 an unrelated event on the same date, it was suspected that Enbridge owned equipment was  
2 experiencing a “freeze-up” issue that prompted a pressure loss and subsequent curtailment of  
3 approximately 7,100 of National Grid distribution customers in Newport and Aquidneck Island,  
4 RI, when the average temperature in Newport was 16<sup>0</sup> F. Restoration efforts took approximately  
5 one week to complete. No further information is available at this time as both incidents are  
6 under investigation.

7 **Q. Beyond the Mr. McGee’s estimated frequency of events, do you agree with Mr.**  
8 **McGee that only a portion of the pipeline extensions would be used in an event?**

9 A. No, I do not. In Mr. McGee’s estimation, out of the fourteen proposed pipeline  
10 extensions, one-third of these extensions would be required to be used over the next decade, one-  
11 third would be required to be used over the next two or three decades, and the remaining one-  
12 third would never be required or utilized for curtailment resiliency. Mr. McGee provides no  
13 factual support or analysis for these estimates. Mr. McGee’s assertion implies that if the  
14 Delmont incident occurred now, only two-thirds of the designed facilities would be needed or  
15 used, which is incorrect. If all fourteen of the proposed pipeline extensions were in service and  
16 an incident similar to Delmont occurred in the winter months, all fourteen pipeline extensions  
17 would be fully utilized to ensure continued gas service.

18 **Q. Can you comment further on the potential frequency of future transmission pipeline**  
19 **curtailments?**

20 A. Yes. First, there do not have to be numerous events for the CR subprogram to be  
21 worthwhile. Even preventing one major incident can avoid the catastrophic impact of loss of gas  
22 during the winter. Second, an event similar to what the CR subprogram is designed to address  
23 has already happened in PSE&G service territory. We cannot state it any more plainly: if the  
24 2016 Texas Eastern curtailment that occurred following the Delmont, PA incident had occurred  
25 in the winter months, the Company may have had 250,000 – 400,000 customers **completely**

1 without gas service at the time of year they depend on it most for heating their homes. This is  
2 something that Rate Counsel continues to ignore. The proposed curtailment resiliency projects  
3 will reduce or eliminate the potential for this magnitude of customer outages if the same type of  
4 event occurred in the winter.

5 C. THE CURTAILMENT RESILIENCY SUBPROGRAM WILL BE USED AND  
6 USEFUL

7 **Q. On page 3 of his testimony, Mr. McGee states that the proposed pipeline extensions**  
8 **would not meet the basic regulatory “used and useful” standard. Please comment**  
9 **on the planned additional use of these facilities.**

10 A. The expected frequency of use of each of the fourteen proposed pipeline extensions under  
11 the gas Curtailment Resiliency subprogram has been discussed in PSE&G’s response to  
12 Discovery Request RCR-G-ENG-0035. While the Company strongly believes the increased  
13 curtailment resiliency in and of itself is sufficient justification for the subprogram, in addition to  
14 the primary function of adding increased curtailment resiliency to the gas distribution system, the  
15 projects have many ancillary benefits. As they are placed into service these projects will be  
16 pressurized and available for use in normal daily operations, immediately enhancing system  
17 reliability by providing additional options to gas system operators to control system pressures  
18 and flows to improve overall pressures at various low points throughout the distribution system  
19 they supply. Additionally, the projects provide greater optionality for scheduled system  
20 maintenance as well as managing system emergencies enabling customers to remain in service  
21 and keeping gas flowing at the pressure needed to provide reliable service. These improved  
22 system pressures can help delay, reduce in scope, or eliminate the need for other system  
23 reinforcements, an additional, but perhaps not obvious, benefit of the Curtailment Resiliency  
24 program.

1            Similar to the CR pipeline projects, the supplemental LNG facility can also support  
2 supply shortfalls either related or unrelated to an actual curtailment, adding to the gas  
3 distribution system's reliability and resiliency. For example, if Third Party supply deliveries on  
4 a peak day are less than anticipated, the supplemental LNG facility can be utilized to offset the  
5 shortfall. If another peak shaving facility is unavailable, the supplemental LNG facility can be  
6 utilized to support the demand. If the Company were to experience low temperatures colder than  
7 the temperature the total supply portfolio was designed to meet, the supplemental LNG facility  
8 could be utilized to support the increased demand. Finally, as a component of the total gas  
9 supply portfolio, the supplemental LNG plant can bridge a supply gap until a pipeline project can  
10 be built to deliver additional firm peak day pipeline capacity.

11 **Q.     Referring again to Mr. McGee's statement on page 9 of his testimony that "It is not**  
12 **sound business practice to invest significant amounts of capital to protect against an**  
13 **emergency of unknown likelihood," why are the Curtailment Resiliency projects a**  
14 **prudent investment?**

15 A.     Contrary to what Mr. McGee says, having emergency facilities available on a standby  
16 basis is a used and useful function and can be a sound business practice against an emergency of  
17 unknown likelihood. I'd like to make an analogy to a fire suppression sprinkler system in a  
18 building. Many buildings have sprinkler systems installed to protect the occupants from fire. In a  
19 typical office building, you could say this is a low probability, high impact event. The sprinkler  
20 system is setup to be at the ready, with full water pressure available, to kick in and put out a fire  
21 at a moment's notice. Hopefully, it will never need to be activated, but that doesn't mean it isn't  
22 being used or useful. I suggest the Board think of the proposed Curtailment Resiliency projects  
23 in this manner. The curtailment of gas supply to the Company similar to the Delmont incident  
24 during the winter months is one of the most significant risks the Company faces in assuring  
25 reliable gas supply service to its customers. It is this type of force majeure event and the

1 potentially widespread disruptions to PSE&G that the CR subprogram seeks to mitigate. The  
2 projects would be designed and ready in the event of a low probability, high impact event that we  
3 all hope never happens.

4 **D. TRUCKED LNG AND REDUNDANCY IN TRANSMISSION PIPELINES**  
5 **ARE NOT SUFFICIENT IF A MAJOR CURTAILMENT WERE TO OCCUR**  
6 **IN THE WINTER**

7 **Q. On page 10 of his testimony Mr. McGee describes alleged alternatives such as**  
8 **trucked LNG in lieu of portions of PSE&G's CR subprogram facilities. Could you**  
9 **comment on the feasibility and availability of this alternative?**

10 A. Mr. McGee's suggested alternatives are not feasible. Trucked LNG is not a viable  
11 alternative to pipeline extensions due to logistics, scale and technical complexity of the necessary  
12 operation in the event of an emergency. PSE&G has analyzed the feasibility of trucked LNG as  
13 an alternative to the CR subprogram, which was provided in the Company's response to RCR-G-  
14 ENG-0036. During a large-scale curtailment event, the availability of LNG would not be  
15 guaranteed, as all of the affected customers and regional Local Distribution Companies  
16 ("LDCs") would be vying for the same resources. Even as an alternative to one of the smaller  
17 pipeline extension projects, trucked LNG is simply impractical and would be cost-prohibitive  
18 and ineffective. The Company would need to purchase and maintain the LNG equipment and  
19 retain trained staff for emergency deployment, which would have to be done quickly; if there is a  
20 loss of gas supply, the loss of gas to the customers can occur in as little as one to two hours in the  
21 winter. Once a gas outage occurs the benefit of mobile LNG is greatly reduced, since every  
22 customer in the curtailed area must be physically turned off prior to being turned back on. This  
23 is a labor intensive and time consuming effort that can be avoided if the curtailment resiliency  
24 projects are constructed; in that case, these outages would not occur in the first place.

1 **Q. Can you explain why, precisely, trucked LNG would not work in the first instance?**

2 A. LNG in trailers cannot be strategically placed in advance of an emergency event due to the  
3 previously mentioned logistics and operational complexity. Trailer operation must be in compliance  
4 with Title 49 CFR Part 193.2019 and NFPA 59A and, therefore, personnel are required to standby  
5 the trailers at all times. Moreover, due to temperature control limitations, a trailer cannot remain  
6 unused indefinitely since stored LNG will gradually vaporize internally, resulting in the release of  
7 un-odorized gas into the atmosphere.

8 **Q. Rate Counsel also suggests that PSE&G has not adequately considered the availability**  
9 **of alternative wholesale supplies; is this correct?**

10 A. Absolutely not; Mr. McGee's assumed availability of increased supplies from other  
11 pipelines in a winter curtailment scenario reflects a lack of understanding of the operations of the  
12 interstate pipeline system. If an incident like the Delmont incident occurs in the winter, all of the  
13 supply would be accounted for from a contractual and physical stand point and there would be no  
14 excess supply available to replace the curtailed supply. Among other things, Mr. McGee's  
15 assumptions regarding the nature of system interconnections and "bi-directional flow" are not  
16 accurate.

17 **Q. Please explain.**

18 A. An interconnection between two pipeline systems does not automatically exist where the  
19 two systems cross. If an interconnection does exist, it is not indicative of bi-directional flow or  
20 operational compatibility. Much more detailed information regarding the interstate pipeline  
21 system's year-round operation is necessary to make an informed determination of any  
22 interconnection's capability. Stating that one pipeline can simply change direction of flow of gas  
23 and/or supply to another pipeline, and will be able to do so as desired in a hypothetical emergency  
24 situation, is both uninformed and misleading. By way of a real-world example, Texas Eastern has a

1 looped system with multiple redundancies and numerous regional interconnections, yet under the  
2 conditions that occurred on April 30, 2016, firm capacity curtailments were enforced and the full  
3 capacity of the system was not restored until the repairs to the pipeline were complete six months  
4 later.

5 **Q. Mr. McGee, at page 11 of his testimony, states that the assumption of a 100% outage**  
6 **for an extended period is simply not realistic. Do you agree?**

7 A. First, I emphasize that the assumption of a 100% curtailment is a scenario, not a prediction  
8 or a requirement. The 100% outage scenario is reasonable, however, because I assumed that had the  
9 Delmont incident occurred during the peak winter period, there would have been very little gas  
10 supply to serve PSE&G customers. Looking at a similar type of incident but further east in  
11 Pennsylvania, and closer to our territory, a 100% outage scenario could be possible as I will detail in  
12 a moment. This assumption, similar to the assumptions regarding the length and extent of outages,  
13 can however be adjusted in a multitude of configurations. There is no one way to run the scenario.

14 **Q. Mr. McGee states on page 11 of his testimony that “Schedule EAM-2 illustrates that in**  
15 **its mid-Atlantic market the pipeline is looped through the Pennsylvania area where the**  
16 **Delmont rupture occurred, permitting backflows around emergencies on these lines.”**  
17 **Do you agree that the looped pipeline design can address the threat of a transmission**  
18 **pipeline curtailment?**

19 A. No. Mr. McGee’s assertion regarding the “looped pipeline system” is an overly simplistic  
20 and incorrect approach to review a pipeline system schematic. Although Mr. McGee’s exhibit does  
21 not show details, Texas Eastern operates multiple parallel pipelines in the Northern loop of their  
22 system downstream of Delmont. After the incident occurred at Delmont, Texas Eastern shut down  
23 all four of the pipelines in the area, effectively a 100% shut down of flow. You cannot assume that  
24 because there is more than one route from point A to point B that normal supplies could be re-  
25 routed during a period of curtailment. In reality, the pipeline systems don’t have surplus capacity  
26 along their respective routes. They are designed (and financed) to deliver firm contract supplies,

1 and during a curtailment there is no capacity in the pipeline route to deliver additional quantity.  
2 This is illustrated by the attached Exhibits WEM-ESII-1R and WEM-ESII-2R, which are taken  
3 directly from the Texas Eastern Transmission (“TE”) and Algonquin Gas Transmission (“AGT”)  
4 publicly available website postings.

5 **Q. Why are the TE and AGT systems significant?**

6 A. The TE and AGT gas transmission systems together comprise the Enbridge system, and as  
7 indicated in numerous places in my direct testimony at pages 17, 21-22, and 24-28, the CR projects  
8 are largely designed to address curtailments on the Enbridge system. These maps show the  
9 operationally available capacity along the TE Penn-Jersey system through Pennsylvania as well as  
10 the AGT system in New Jersey, New York and a portion of Connecticut. To interpret the maps, the  
11 red lines represent the TE gas transmission system and the blue line represents the AGT gas  
12 transmission system. Each compressor station and mainline point along the system is identified by  
13 name with a text box beneath showing the available capacity and the total nominations scheduled at  
14 that point on the system for the gas day in MDTH/Day (10,000 Therms/Day). The Enbridge  
15 Delmont Map of April 30, 2016, attached hereto as Exhibit WEM-ESII-1R, shows details of the  
16 Enbridge pipeline system flows on the day following the incident in Delmont, PA. I have  
17 highlighted the Delmont, Pennsylvania and Lambertville, Hanover and Mahwah Mainline New  
18 Jersey locations for ease of reference.

19 **Q. Please explain what the Exhibit WEM-ESII-1R shows.**

20 A. Exhibit WEM-ESII-1R shows that Delmont capacity was reduced to zero, and the only gas  
21 flowing along the entire northern loop of the Penn-Jersey system was coming from the Leidy,  
22 Pennsylvania storage field. Flows on the southern loop were significant; however, the salient point  
23 is that these volumes were all committed to firm customers along the loop, and none of the volume

1 reached the Lambertville, NJ location as evidenced by the scheduled nominations at Lambertville of  
2 just 30 MDTH/Day.

3 **Q. What does the map demonstrate about “bi-directional flow”?**

4 A. The diagram indicates that both the Mahwah Mainline and Hanover stations on the AGT  
5 system have capacity to flow in both directions (flow to the east is shown as a positive value and a  
6 negative value represents flow in the reverse direction to the west). On this day a significant  
7 volume at Hanover was nominated to flow west. This had the effect of mitigating the curtailment to  
8 some degree. However, I stress that this was due to the fact that it was springtime, when demand  
9 was down significantly. By contrast, the Enbridge Firm Supply Map of December 10, 2018,  
10 attached as Exhibit WEM-ESII-2R, shows details of the Enbridge pipeline system flows on an early  
11 winter day of December 10, 2018, when the average temperature in Newark was 32<sup>0</sup> F. On that day  
12 the Delmont to Lambertville section of the Penn-Jersey system was 97.5% utilized along the entire  
13 northern loop, as evidenced by the scheduled nominations compared to each station’s capacity. In  
14 the AGT system, gas nominated at the Hanover and Mahwah Mainline location was flowing east  
15 based on the positive nomination value, and the system was 94.2% utilized from Mahwah to  
16 Chaplin station. Included on this map is the percent of PSE&G’s Enbridge supply that moves  
17 through the northern loop. Approximately ninety-one percent (91%) moves along the  
18 approximately 100 mile Delmont to Perulack section, and 100% moves along the approximately  
19 150 mile Perulack to Lambertville section. Zero percent (0%) of PSE&G’s gas supply moves east  
20 along the southern loop for several reasons. The firm capacity at the eastern end of this part of the  
21 system is limited, as shown by the East of Eagle capacity of 600 MDTH/Day, which is less than  
22 25% of the 2,486 MDTH/Day capacity at Lambertville. Additionally, this capacity is committed to  
23 Pennsylvania firm customers in the Philadelphia metropolitan area, and would not reach  
24 Lambertville during a winter emergency.

1 **Q. What about bi-directional flow on the Algonquin system? Does PSE&G have firm**  
2 **capacity to move gas through the AGT system into the Texas Eastern system?**

3 A. No. This capacity is held by other entities and PSE&G could not simply source Texas  
4 Eastern supplies from the AGT system at an interconnection such as Mahwah or Hanover. This is  
5 particularly true given that the AGT system is primarily designed to serve the New England markets  
6 of Connecticut, Massachusetts and Rhode Island. In the winter period, it cannot be expected that  
7 secondary supplies would be diverted from these customers and made available to the Company  
8 once a curtailment occurred. In fact, with regional deliveries curtailed, the Company would have to  
9 assume that operational pipelines would limit flow to existing firm supply contracts in order to  
10 maintain system stability. The illustration in Exhibit WEM-ESII-2R makes it abundantly clear that  
11 if there were a significant winter event anywhere along the northern loop of the TE Penn-Jersey  
12 system, a 91% to 100% curtailment of Enbridge supplies is probable. So while Mr. McGee's bi-  
13 directional flow solution appears promising on the surface, it will not be possible for PSE&G to  
14 redirect gas supply during a curtailment event as noted above because there will be no available  
15 capacity to move gas from other systems back into the Enbridge system in New Jersey.

16 **E. ALL SEVEN PROPOSED M&R STATIONS SHOULD BE MODERNIZED**

17 **Q. With respect to the M&R station modernization program, do you agree with Mr.**  
18 **McGee's assertion that there are no extenuating circumstances that warrant the**  
19 **rebuild of the four M&R substations he believes the Board should reject?**

20 A. No. Similar to the cast iron replacement programs and modernization of the gas distribution  
21 system approved in GSMP I & II, and Energy Strong I, the M&R stations, which are the sources of  
22 all the gas that flows into the distribution system, need to be modernized to address obsolescence,  
23 upgrade to current design standards, implement new technologies, and uniformity of M&R station  
24 design. Six of the seven stations in the Program were put into service between 1955 and 1959. The  
25 average service age of the seven stations is over 60 years old. Therefore, in order to prudently

1 combat the growing obsolescence of its M&R stations, the Company developed a risk-based  
2 approach to selecting stations presenting the highest risk to the public and the Company. The result  
3 of the risk analysis identified the seven proposed stations to be rebuilt and modernized.

4 **Q. Can you reconcile why Mr. McGee has agreed to the upgrading of 3 of the M&R**  
5 **stations and advises the Board to reject the remaining four?**

6 A. No. Mr. McGee has not offered any risk analysis to differentiate the three M&R Station  
7 upgrades he agrees should be approved by the Board from the other four M&R Station upgrades he  
8 advises to reject. On page 15 of Mr. McGee’s testimony, he states that the other four stations  
9 (Paramus, Westampton, Mount Laurel, and Hillsborough) would only be rebuilt on an as-needed  
10 basis. However, these four stations share similar designs to that of the three stations he agrees  
11 should be accelerated. They all have upstream relief overpressure protection, which could release  
12 methane into the atmosphere at an extreme volume due to the high pressures delivered by the  
13 interstate pipelines.

14 **F. THE COMPANY WILL WORK WITH THE BOARD TO DEVELOP**  
15 **APPROPRIATE PERFORMANCE METRICS**

16 **Q. Rate Counsel Dr. Dismukes asserts that the Board should outright reject the Energy**  
17 **Strong II Program for a number of reasons, including because it lacks performance**  
18 **metrics. Do you agree?**

19 A. No. In his direct testimony (at page 21), Dr. Dismukes claims that the Company’s  
20 proposal is deficient because it did not include performance metrics for the proposed ESII  
21 gas program. However, this is not a filing requirement of the IIP regulation. Section  
22 14:3-2A.5 of the IIP enumerates the minimum filing and reporting requirements. At  
23 subsection (e) the IIP states “following the Board's approval of a utility's petition in  
24 support of an Infrastructure Investment Program, the utility shall file supportive semi-  
25 annual status reports with the Board and the Division of Rate Counsel for project

1 management and oversight purposes that, at a minimum, contain the following: (6) any  
2 other performance metrics concerning the Infrastructure Investment Program required by  
3 the Board.” (emphasis added). Inclusion of performance metrics is clearly not a filing  
4 requirement of the IIP regulation, nor is it a specific reporting requirement. No specific  
5 performance metrics have been identified in the IIP regulation. In fact, any performance  
6 metrics required for reporting purposes during the term of an IIP is at the discretion and  
7 specification of the Board.

8 **Q. Despite not being an IIP requirement, have you considered any potential**  
9 **performance metrics for the CR subprogram?**

10 A. While the Company will take its direction from the Board as to what, if any, specific  
11 performance metrics it must report, PSE&G envisions reporting that includes metrics the  
12 Company believes it can quantify in the event of a curtailment, including for example:

- 13 ○ facilities available for use
- 14 ○ facilities are operable
- 15 ○ days of unplanned unavailability
- 16 ○ number of gas customer outages
- 17 ○ duration of gas customer outages

1 **Q. What performance metrics have you considered for the M&R upgrade**  
2 **subprogram?**

3 A. For the M&R station upgrade sub-program, the Company will annually report on the  
4 following for all facilities constructed and placed into service, such as the performance of our  
5 Energy Strong II investments - particularly whether raised stations suffered outages, and for what  
6 reasons, such as during Major Events.

7 **G. THE PROPOSED PIPE SIZE FOR THE CURTAILMENT RESILIENCY**  
8 **SUBPROGRAM IS APPROPRIATE**

9 **Q. On page 13 of Mr. McGee's testimony he states that: "...if the extensions are built**  
10 **larger than would be necessary for the strict purpose of curtailment resiliency, the**  
11 **Company should not be permitted to recover - as accelerated rate treatment in its**  
12 **proposed surcharge mechanism - any cost that is more than the cost of the smaller**  
13 **line". Can smaller sized pipes be used for the CR pipeline extensions?**

14 A. While it may be possible to reduce the diameter of some of the proposed pipeline  
15 extensions based on currently available contracted pipeline capacities at the M&R stations  
16 associated with the projects, as stated in discovery response RCR-G-ENG-0037, the proposed  
17 curtailment resiliency pipeline extensions are mainline trunk systems designed for high volume  
18 flow across significant distances within the Company's service territory. These trunk systems  
19 will have extremely long in-service lives and it is practical to consider future contract capacity  
20 increases and extension of the systems for additional resiliency and reliability.

21 **Q. Does this conclude your testimony?**

22 A. Yes.

**Texas Eastern Transmission, LP**

**Operationally Available Capacity**

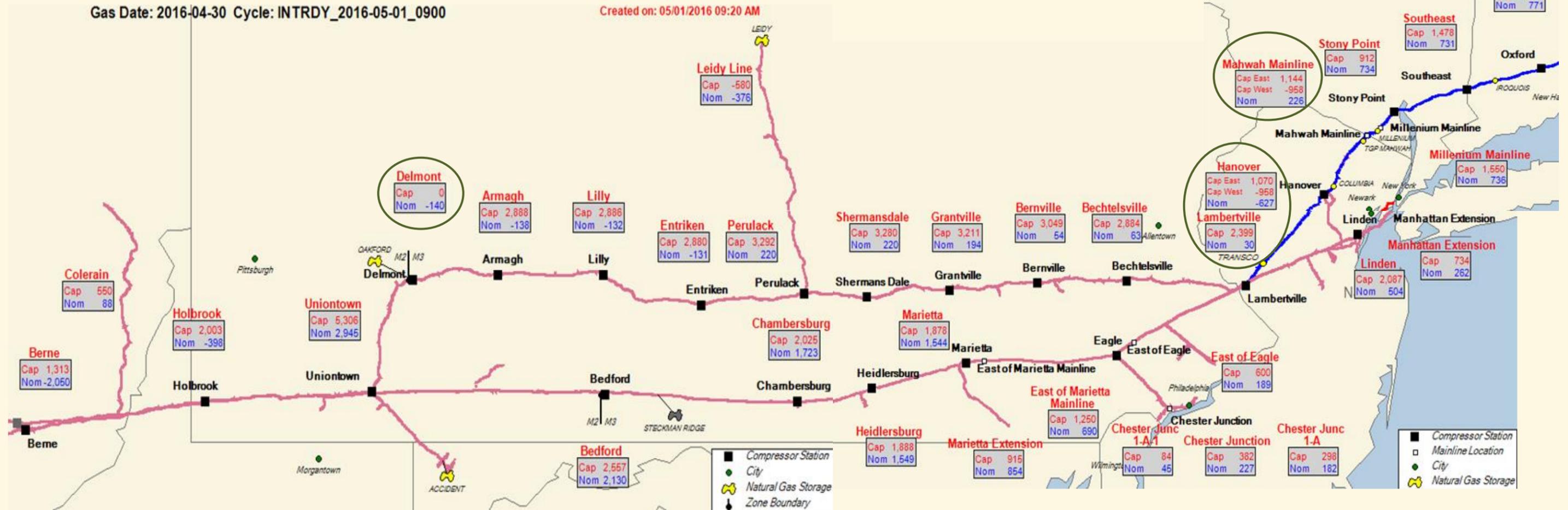
Gas Date: 4/30/2016 Cycle: INTRDY\_2016-05-01\_0900

**Algonquin Gas Transmission, LLC**

**Operationally Available Capacity**

Gas Date: 4/30/2016 Cycle: INTRDY\_2016-05-01\_0900

Gas Date: 2016-04-30 Cycle: INTRDY\_2016-05-01\_0900



SOURCE: <https://infopost.spectraenergy.com/infopost/AGHome.asp?Pipe=AG>  
<https://infopost.spectraenergy.com/infopost/TEHome.asp?Pipe=TE>

MONDAY, DECEMBER 10, 2018

NEWARK AIRPORT TEMPERATURE

HIGH 41° F  
LOW 23° F  
AVERAGE 32° F

### Algonquin Gas Transmission, LLC

#### Operationally Available Capacity

Gas Date: 12/10/2018 Cycle: INTRDY\_2018-12-11\_0900

Gas Date: 2018-12-10 Cycle: INTRDY\_2018-12-11\_0900

MAHWAH to CHAPLIN  
AVERAGE NOMINATION = 94.2% of CAPACITY

### Texas Eastern Transmission, LP

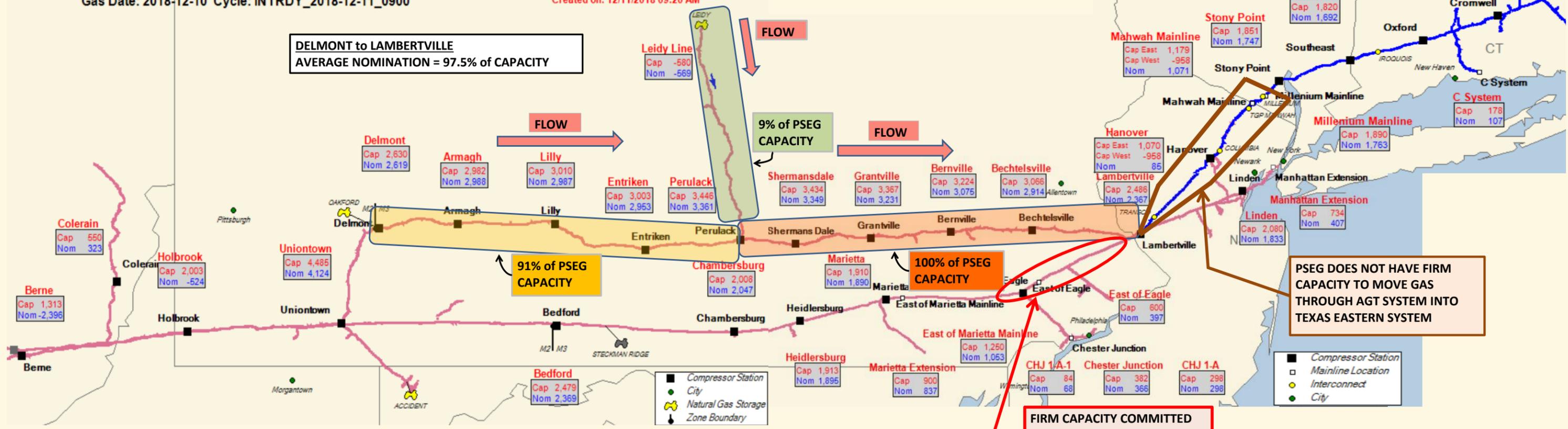
#### Operationally Available Capacity

Gas Date: 12/10/2018 Cycle: INTRDY\_2018-12-11\_0900

Gas Date: 2018-12-10 Cycle: INTRDY\_2018-12-11\_0900

Created on: 12/11/2018 09:20 AM

DELMONT to LAMBERTVILLE  
AVERAGE NOMINATION = 97.5% of CAPACITY



SOURCE: <https://infopost.spectraenergy.com/infopost/AGHome.asp?Pipe=AG>  
<https://infopost.spectraenergy.com/infopost/TEHome.asp?Pipe=TE>