

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of)
DTE Gas Company for approval of a)
Gas Cost Recovery Plan, 5-year Forecast)
and Monthly GCR Factor for the 12 months)
ending March 31, 2019)
_____)

Case No. U-18412

QUALIFICATIONS

AND

DIRECT TESTIMONY

OF

MICHAEL D. SLOAN

DTE GAS COMPANY
DIRECT TESTIMONY OF MICHAEL D. SLOAN

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1 **Q. What is your name and business address?**

2 A. My name is Michael D. Sloan. My business address is 9300 Lee Highway, Fairfax, VA
3 22031.

5 **Q. By whom are you employed and in what capacity?**

6 A. I am employed by ICF as Managing Director, Natural Gas and Liquids Advisory
7 Services.

9 **Q. What is your educational background?**

10 A. I received a B.A. Degree in Economics and Policy Studies with a concentration in
11 Operations Research from Dartmouth College in 1983.

13 **Q. What is your employment background?**

14 A. I was hired full time by Energy and Environmental Analysis, Inc. (EEA) as an Energy
15 Analyst in 1983. Between 1983 and 2006, I was employed full time by EEA, rising
16 to the position of Project Manager. EEA was acquired by ICF in 2006, and I have
17 been employed full time by ICF since the acquisition was completed in 2006. I was
18 promoted to the position of Principal in 2012. I was promoted to the position of
19 Managing Director in 2016.

21 **Q. Please describe ICF?**

22 A. ICF is one of the largest consultants offering policy, management and technical
23 expertise to the North American gas and oil industry. In addition to work with many
24 private sector clients in the gas and oil industry, we also have been consultants to the
25 U.S. Department of Energy (DOE), the Federal Energy Regulatory Commission

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(FERC), and the U.S. Environmental Protection Agency (EPA), as well as government agencies in foreign countries including Canada, India, Mozambique, Qatar, and members of the European Union. We also undertake special studies for industry organizations like the American Petroleum Institute (API), Interstate Natural Gas Association of America (INGAA), and America's Natural Gas Alliance (ANGA), among others. ICF is known for its quantitative, analytical approaches to solving client problems. We have developed models that reflect the present and projected conditions of the oil and natural gas industries, the electric power industry, the coal industry, and of the impact of environmental regulation across all energy industry sectors.

For our work on behalf of DTE Gas Company (DTE Gas), ICF used the Gas Market Model (GMM[®]) as the basis for the analysis. Over the last 20 years, the GMM[®] has been used extensively to study issues related to gas market developments in North America. The results have been presented in a number of regulatory proceedings in both the U.S. and Canada, including in Michigan Public Service Commission (MPSC or Commission) Case Nos. U-15451, U-16921, U-17691, U-17920, U-17941, and U-18143. In the past year, I have used the model results to support testimony before the National Energy Board of Canada, and the Nova Scotia Utility and Review Board in addition to the MPSC. The model is also widely used as a natural gas market and pipeline strategic planning tool by a broad variety of corporations, industry associations, and governmental agencies.

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1 **Q. What is your professional experience?**

2 **A.** I have worked in the field of energy economics for 35 years with a focus on natural
3 gas and propane markets in North America. I have testified before the National
4 Energy Board of Canada (NEB), the Ontario Energy Board, the MPSC, and other
5 regulatory agencies and provided evidence— or authored reports submitted as
6 evidence— in Michigan, Alberta, Ontario, Quebec, Manitoba, and Nova Scotia. I
7 also submitted testimony to FERC on the relationship between gas and electric
8 markets in California during the California energy crisis.

9
10 My work was cited in FERC Order Nos. 637 and 637-A and in FERC’s “Fact-Finding
11 Investigation of Potential Manipulation of Electric and Natural Gas Prices in Western
12 Markets.”¹ I authored reports on the structure and behavior of natural gas and energy
13 markets on subjects such as price volatility² and liquidity.³ I also developed a
14 quantitative methodology to evaluate the liquidity of natural gas markets throughout
15 North America.

16

17 **Q. Have you previously testified or submitted evidence in any regulatory**
18 **proceedings before the MPSC?**

19 **A.** Yes. I have testified and/or filed testimony before the MPSC on behalf of DTE Gas
20 Company (DTE Gas) in Case Nos. U-17941 and U-17691 on issues related to natural
21 gas markets and the NEXUS Gas Transmission Project (NEXUS). I have testified
22 on behalf of DTE Electric in Case No. U-17920 and have filed testimony on behalf

¹ Docket No. PA02-2-005

² Natural Gas and Energy Price Volatility, prepared for Oak Ridge National Laboratory and published by the American Gas Foundation, October 2003.

³ Analysis of Natural Gas Market Liquidity at Points Affecting New York State LDCs, New York Gas Group, Spring 2003.

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1 of DTE Electric in Case No. U-18143. I also coauthored reports submitted to the
2 MPSC in Case Nos. U-15451 and U-16921.

3
4 **Q. What is the purpose of your testimony in this proceeding?**

5 A. The purpose of my testimony is to introduce and review two assessments of the value
6 of NEXUS to DTE Gas customers and Michigan natural gas consumers that were
7 provided to DTE Gas by ICF in December 2014 and December 2015. In 2014, and
8 again in 2015, DTE Gas engaged ICF to provide an independent assessment for GCR
9 proceedings of the value to DTE Gas customers of holding capacity on the proposed
10 NEXUS from the Marcellus/Utica gas producing plays in the Appalachian Basin (the
11 Appalachian Basin) in eastern Ohio/western Pennsylvania to the DTE Gas Citygate
12 in Michigan. The assessments included an independent evaluation of the changes in
13 natural gas markets that were driving the development of NEXUS as well as
14 contemporaneous assessments of the value of NEXUS to DTE Gas customers and,
15 more broadly, to Michigan natural gas consumers under a range of potential market
16 conditions. The analysis is documented in two reports that have been previously
17 reviewed by the MPSC:

- 18 1) The ICF report titled, “The Value of Nexus Pipeline Capacity to DTE Gas
19 Customers” (December 2014 Report) which was presented in the DTE Gas
20 2015 GCR Plan Case (U-17691)
- 21 2) The ICF report titled, “The Value of Nexus Pipeline Capacity to DTE Gas
22 Customers – December 2015 Update” (December 2015 Update) which was
23 presented in the DTE Gas 2016 GCR Plan Case (U-17941)

24 My testimony also provides a review of changes in natural gas markets and changes
25 to the status of NEXUS that have occurred since my earlier testimony.

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1 **Q. Are you sponsoring exhibits in this proceeding?**

2 **A.** Yes. I am sponsoring the following Exhibits:

3 1) Exhibit A-33: Curriculum Vitae for Michael D. Sloan

4 2) Exhibit A-34: ICF Report: The Value of Nexus Pipeline Capacity to DTE
5 Gas Customers, December 2014.

6 3) Exhibit A-35: ICF Report: The Value of Nexus Pipeline Capacity to DTE
7 Gas Customers: December 2015 Update.

8

9 **Q. Can you describe the work that ICF has provided to DTE Gas concerning the**
10 **NEXUS Pipeline?**

11 **A.** Yes. ICF was first engaged by DTE Gas regarding NEXUS in June 2014 when ICF
12 provided a long-term projection of basis prices in North America, which DTE Gas
13 used to prepare the Landed Cost Analysis contained in Exhibits A-39 and A-40
14 sponsored by Witness R. G. Lawshe. As part of this engagement ICF completed the
15 December 2014 Report, which I sponsored as an expert witness in the DTE Gas GCR
16 Case No. U-17691. In 2015, ICF was engaged by DTE Gas to update its prior
17 analysis, which I sponsored as an expert witness in the DTE Gas GCR Case No. U-
18 17941. In 2016, ICF was engaged by DTE Gas to provide an update to my written
19 testimony from Case No. U-17941, including an update of the changes in natural gas
20 markets and changes to the status of NEXUS that had occurred since my earlier
21 testimony. In 2017, ICF was engaged by DTE Gas to provide expert witness
22 testimony concerning the work performed for DTE Gas regarding NEXUS since June
23 2014, including an update of the changes in natural gas markets and changes to the
24 status of NEXUS that have occurred since my earlier testimony. Since June of 2014,

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1 as part of these engagements, I have participated in numerous conversations with
2 DTE Gas on natural gas market issues related to NEXUS.

3

4 **Q. Over your nearly four-year history on this assignment, have you ever advised**
5 **DTE Gas to abandon its pursuit of securing capacity on NEXUS?**

6 A. No. None of my prior work for DTE, including associated updates to market
7 fundamentals would lead me to conclude that it would be unadvisable for DTE Gas
8 to hold capacity on NEXUS as part of its natural gas supply portfolio. Over the past
9 four years, my analysis of both current and projected market conditions has
10 consistently indicated that DTE Gas' customers would benefit from the construction
11 of NEXUS, and that DTE Gas' customers would benefit from the company
12 contracting for 15-years of capacity on NEXUS.

13

14 **Q. What is the NEXUS Gas Transmission Project?**

15 A. NEXUS is a proposed pipeline that will connect the Marcellus and Utica plays in the
16 Appalachian producing basin with upper Midwest and Canadian markets. The
17 pipeline will consist of approximately 250 miles of large diameter pipe and has been
18 designed to transport 1.5 Bcf/d of gas. As shown on in Figure 1, the pipeline will
19 begin in eastern Ohio and extend northwesterly to interconnect with the DTE Gas
20 transmission system and Vector pipeline. The pipeline will deliver natural gas
21 produced in the Appalachian Basin directly to gas markets in Michigan, Chicago,
22 and Ontario.

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Figure 1 - NEXUS Gas Transmission Project



Source: NEXUS Gas Transmission

Q. What is driving the development of NEXUS?

A. NEXUS is being driven by fundamental changes in North American natural gas markets related to the development of new shale gas production technologies, which have greatly increased the availability of low cost natural gas supply in the Appalachian region.

The growth in shale gas production is shifting the location of natural gas production with profound impacts on natural gas markets. While there are economic shale gas plays in a variety of regions including western Canada, the Gulf Coast, and the Mid-Continent, the most important shift in natural gas production has been the development of the Marcellus and Utica shale plays in the Appalachian region.

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1 Growth in production potential in this region is currently outpacing the transportation
2 infrastructure needed to move the new production to markets.

3

4 On the demand side, the widespread availability of low cost natural gas is driving
5 rapid growth in demand, primarily for power generation as coal and nuclear facilities
6 are retired, increased industrial demand in the Gulf Coast, and exports in the form of
7 either liquefied natural gas (LNG) exports or exports to Mexico, both of which
8 primarily are shipped from the Gulf Coast.

9

10 The shifts in the location of production and demand, as well as the rapid growth in
11 production and demand volumes, are leading to a restructuring of the natural gas
12 transportation and distribution system in North America.

13

14 NEXUS is attractive both to producers in the Appalachian Basin searching for new
15 markets for their natural gas and to customers in the Midwest seeking to access low
16 cost gas supplies and to diversify supply away from traditional supply sources that
17 potentially will become higher cost, less available, or less liquid.

18

19 **Q. What is the current status of the NEXUS Gas Transmission Project?**

20 A. NEXUS Gas Transmission filed a Section 7(C) application with FERC for approval
21 to construct the pipeline in November 2015. According to the original NEXUS filing,
22 “NEXUS has entered into definitive agreements with seven shippers, which together
23 combine for a commitment of firm capacity of 835,000 Dth/d. The target in-service
24 date on the Project facilities is November 1, 2017.”⁴ Since the original Nexus

⁴ NEXUS Gas Transmission, NEXUS Gas Transmission Project FERC Section 7 (c) application, Volume 1, Page 6. November 20, 2015.

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1 application was filed with FERC, NEXUS has reached a number of important project
2 milestones, including:

3 1) On September 9, 2016, NEXUS received air permits from the Ohio
4 Environmental Protection Agency (EPA) necessary for the five compressor
5 stations in Ohio.⁵

6 2) On September 14, 2016, NEXUS filed an update to the record in the NEXUS
7 Certificate Application to reflect an additional precedent agreement with
8 Columbia Gas of Ohio for firm transportation service for a maximum daily
9 quantity of 50,000 Dth/day for a primary term of fifteen years.⁶ The Columbia
10 Gas of Ohio precedent agreement increased the total of the announced capacity
11 precedent agreements to 885,000 Dth/day.

12 3) On November 30, 2016, FERC released the final environmental impact statement
13 (EIS) for NEXUS.⁷

14 4) On August 25, 2017, FERC approved construction of NEXUS.

15
16 NEXUS began construction upon receipt of the FERC approval, and currently
17 expects to be in service in the third quarter of 2018.

18
19 **Q. What did the FERC EIS conclude about NEXUS?**

20 **A.** FERC approved the Final EIS for NEXUS on November 30, 2016. According to
21 the EIS, "The FERC staff concludes that approval of the Projects would result in
22 some adverse environmental impacts; however, these impacts would be reduced to

⁵ <http://www.epa.state.oh.us/News/OnlineNewsRoom/NewsReleases/TabId/6596/ArticleId/993/language/en-US/tag/air-permit/ohio-epa-issues-air-permits-for-five-nexus-compressor-stations.aspx>

⁶ NEXUS Gas Transmission, NEXUS Gas Transmission, LLC, Docket No. CP16-22-000 Executed Precedent Agreement, September 14, 2016.

⁷ FERC Final Environmental Impact Statement, NEXUS Gas Transmission Project and Texas Eastern Appalachian Lease Project, Volume 1, Page 3-7, November 2016.

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1 acceptable levels with the implementation of NEXUS's and Texas Eastern's
2 proposed mitigation measures and the additional measures recommended by staff in
3 the final EIS." (FERC EIS page 1.)
4

5 **Q Did FERC review alternatives to the NEXUS project as part of the EIS?**

6 A. Yes. In the EIS, FERC staff found that no other existing or proposed pipelines to
7 carry gas from the Appalachian basin to the Midwest markets were preferable to the
8 NEXUS Pipeline to serve the markets served by NEXUS.
9

10 FERC evaluated six existing (brownfield) pipeline systems presently operating in the
11 vicinity of the NEXUS Pipeline, including ANR Pipeline, Columbia Gas
12 Transmission, Dominion, Panhandle Eastern Pipeline, Rockies Express Pipeline, and
13 Texas Eastern Pipeline, and concluded that:

14 "Conceivably, these six systems could be used in various combinations to
15 transport natural gas to and from the markets served by the [NEXUS and
16 Texas Eastern] Projects; however, the main constraint limiting the viability
17 of these systems is that none of these existing pipelines have capacity
18 available for transporting the required volumes of natural gas needed by the
19 Projects and subsequently would also require expansion of facilities.
20 Furthermore, these existing systems do not service all the proposed receipt
21 and delivery points; therefore, additional pipeline lateral facilities from the
22 mainline pipelines to the receipt and delivery points would be needed. For
23 these reasons, use of these systems is not technically feasible without
24 substantial modifications and the construction of new natural gas
25 transmission infrastructure, including new mainline, pipeline loop, lateral

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1 pipeline, and compression. Under the best scenario, we estimate that about
2 300 miles of new pipeline or pipeline loop would be required to achieve the
3 Projects' objectives, which is substantially more than the proposed Projects.
4 Further, these systems may not be economically viable due to higher capital
5 cost, rate stacking, and fuel retention. These systems, therefore, are not
6 reasonable alternatives to the Projects and we eliminated them from further
7 consideration." (NEXUS EIS, Page 3-4)

8
9 FERC also considered three potential new (greenfield) pipeline projects as
10 alternatives to NEXUS. These included two projects, the proposed Rover and
11 Leach Express Pipelines, with applications pending before FERC, and one
12 project, the ANR East Pipeline Project, without an application pending before
13 FERC. After consideration, FERC concluded that:

14 "Conceivably, these proposed or planned pipelines could be used to
15 transport natural gas to and from the markets served by the projects.
16 However, the main constraints limiting the viability of these pipelines are
17 the same as those limiting the viability of existing system pipelines: they
18 already are almost fully subscribed and do not serve the required definitive
19 receipt and delivery points."

20
21 **Q. Did FERC comment on the need for NEXUS as part of the Certificate of**
22 **Approval?**

23 A. Yes. According to the FERC order approving NEXUS issued on August 25, 2017,
24 FERC found that:

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1 “The final EIS analyzed the availability of capacity on other pipelines to serve as
2 alternatives to the NEXUS project and concluded that sufficient capacity does not
3 exist to provide all of the service contemplated by the NEXUS project. There is also
4 no evidence that available capacity exists on other pipelines to provide the 885,000
5 Dth per day of service currently subscribed by the NEXUS shippers.”⁸

6
7 “NEXUS’s proposed project will serve a demonstrated demand for natural gas. Based
8 on the benefits the project will provide and the minimal adverse impacts on existing
9 shippers, other pipelines and their captive customers, and landowners and
10 surrounding communities, we find, consistent with the Certificate Policy Statement
11 and NGA section 7(c), that the public convenience and necessity requires approval
12 of NEXUS’s proposal, subject to the conditions discussed below.”⁹

13
14 **Q. Do you concur with the FERC assessment of alternative pipeline options, and**
15 **the FERC assessment of project need?**

16 **A.** Yes.

17
18 **Q. Have you quantified the impacts of additional pipeline capacity from the**
19 **Appalachian Basin to Michigan?**

20 **A.** Yes. In 2014, I prepared a detailed assessment of the impacts of building NEXUS on
21 Michigan consumers and DTE Gas customers. This analysis was presented to the
22 Michigan Public Service Commission in Case No. U- 17691 and is included as
23 Exhibit A-34 in the current case. In 2015, I prepared a comprehensive update to the

⁸ FERC Order, Docket No. CP16-22-000, et al. Page 14.

⁹ FERC Order, Docket No. CP16-22-000, et al. Page 19.

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2014 analysis. This analysis was presented to the Michigan Public Service Commission in Case No. U- 17941 and is included as Exhibit A-35 in the current case.

Q. Based on these analyses did you conclude that additional pipeline capacity from the Appalachian Basin into Michigan would benefit Michigan natural gas consumers?

A. Yes. Based on my analysis of the impacts of additional pipeline capacity from the Appalachian Basin into Michigan, I found that the additional pipeline capacity will provide substantial benefits to Michigan natural gas consumers. The benefits that will accrue to all Michigan natural gas consumers include:

- 1) NEXUS will provide Michigan consumers with access to a large and growing gas producing region, the Marcellus and Utica plays in the Appalachian Basin, principally in western Pennsylvania and eastern Ohio. This will be a long term and reliable source of gas supply and create additional supply diversity and supply liquidity for Michigan natural gas markets.
- 2) The additional pipeline capacity will lead to a reduction in natural gas prices in most Michigan markets, including a significant reduction in natural gas prices at the MichCon Citygate. In addition, the increased supply will compete with natural gas from other sources of supply currently relied on by Michigan natural gas consumers, thereby leading to lower prices in the other supply basins serving Michigan markets.

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- 1 **Q. What did you conclude in the 2015 assessment of the impacts of additional**
2 **pipeline capacity from the Appalachian Basin to Michigan on natural gas**
3 **prices?**
- 4 **A. Building incremental pipeline capacity from the Appalachian Basin into Michigan**
5 **will significantly impact natural gas prices in the Appalachian Basin and in Michigan,**
6 **as well as in the supply basins currently serving the Michigan and Ontario markets.**
7 Table 1 below illustrates ICF's 2015 projection of the impact of NEXUS on the price
8 of gas at the supply basins that provide gas to the Michigan markets. The impact of
9 NEXUS shown in Table 1 below reflects the impact of 1.5 Bcfd of incremental
10 capacity on supply prices.¹⁰ In all of the basins currently serving Michigan markets,
11 gas prices will decline once the low cost supply from Marcellus/Utica enters the
12 market. Marcellus/Utica supply at the NEXUS receipt point will increase in cost but
13 still be the low cost source of gas. These lower supply costs will benefit all Michigan
14 consumers.

¹⁰ Additional capacity leads to higher prices at the NEXUS receipt point, and lower prices at competing supply centers serving the Michigan Market.

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Table 1: Impact of NEXUS on Regional Gas Prices (Average Nominal \$/MMBtu, Nov 2017-Oct 2032)

Market Locations	Nexus without Rover Scenario		Impact of NEXUS (without Rover)	Nexus with Rover Scenario		Impact of NEXUS (with Rover)
	No Pipe Added	NEXUS Only		Rover Only	Rover and NEXUS	
MichCon	5.96	5.70	(0.25)	5.47	5.32	(0.16)
Great Lakes	5.80	5.58	(0.22)	5.38	5.24	(0.14)
Viking/ANR ML-7	5.80	5.58	(0.22)	5.38	5.24	(0.14)
Vector/Chicago	5.85	5.63	(0.22)	5.41	5.28	(0.14)
Defiance	5.90	5.65	(0.25)	5.36	5.22	(0.14)
Lebanon	5.73	5.64	(0.10)	5.34	5.22	(0.11)
Panhandle Field Zone	5.56	5.38	(0.18)	5.20	5.09	(0.11)
ANR Alliance	5.85	5.63	(0.22)	5.41	5.28	(0.14)
ANR SW	5.52	5.34	(0.17)	5.16	5.05	(0.11)
(NEXUS Receipt Point)	3.78	4.01	0.23	4.32	4.49	0.17

Sources: ICF GMM® CPP Cases, August 2015 (with and without Rover and NEXUS)

Q. What are the potential benefits to Michigan consumers?

A. The change in natural gas prices at the different market centers projected by ICF for the different level of pipeline capacity expansions between the Appalachian Basin and the Midwest through Michigan and into Ontario is projected to lead to a reduction in natural gas costs to Michigan consumers regardless of whether or not DTE Gas contracts for capacity on NEXUS. Even without consideration of the benefits of holding capacity on NEXUS, ICF estimated that Michigan natural gas consumers would save either \$1.6 billion if Rover was also developed, or \$2.5 billion if Rover was not developed, over the 15-year period from November 2017 through October 2032 due to the completion of NEXUS. For DTE Gas customers only, that savings will be either \$251 million if Rover is also developed, or \$386 million if Rover is not developed. The values for the specific pipeline capacity expansion scenarios are shown in Table 2:

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Table 2: Impact of Building the NEXUS Pipeline on Natural Gas Supply Costs¹

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Gas Customers (Million \$)	All Michigan Consumers (Million \$) ³
NEXUS Without Rover	-\$386	-\$2,455
NEXUS With Rover	-\$251	-\$1,595
^{1/} November 2017 through October 2032.		
^{2/} Based on gas price reduction, without holding NEXUS capacity in the DTE pipeline capacity portfolio.		
^{3/} DTE Gas supply portfolio represents on average 15.7 percent of total Michigan natural gas purchases between November 2017 and October 2032.		

Source: ICF

2

3

4 **Q. What is the current status of the Rover Pipeline?**

5 A. The Rover Pipeline has been approved by FERC, and was placed into partial service
6 on August 31, 2017. Rover currently expects to be fully in service by the end of the
7 first quarter of 2018¹¹.

8

9 **Q. Why did you include Rover Pipeline in the analysis if the Pipeline is already**
10 **approved and partially in-service?**

11 A. At the time that the analysis was conducted, it was not clear the Rover Pipeline would
12 be completed. Since the capacity provided by the Rover Pipeline has a significant
13 impact on both gas supply into the Michigan region, and on take-away capacity from
14 the Marcellus/Utica, it was important to consider market conditions both with and
15 without Rover Pipeline.

16

17 **Q. How did you estimate the natural gas cost savings?**

18 A. I used the ICF Gas Markets Model (GMM[®]) to project the impact of adding
19 incremental pipeline capacity from the Appalachian Basin to Michigan markets on

¹¹ As of December 15, 2017. <http://www.roverpipelinefacts.com/>

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1 natural gas market prices, as well as on the projected supply portfolio for Michigan
2 gas consumers, in order to determine the impact of holding NEXUS capacity on
3 pipeline costs and commodity purchase costs.

4
5 I estimated the total cost savings for all Michigan consumers based on the simplifying
6 assumptions that Michigan power generators purchase gas supplies at the MichCon
7 Citygate price and also that Michigan non-power gas consumers have a portfolio of
8 gas supplies based on the source of natural gas supplies delivered into Michigan.

9
10 **Q. Are there additional benefits to Michigan consumers generally and to DTE Gas**
11 **customers specifically if DTE Gas holds NEXUS capacity in its pipeline capacity**
12 **portfolio?**

13 A. Yes. There are two primary benefits associated with the DTE Gas contract for
14 NEXUS capacity:

15 1) Contracting for capacity on NEXUS increased the likelihood that the project
16 would be developed. Based on FERC filings by NEXUS, the pipeline has
17 precedent agreements for 885,000 Dth/day out of the capacity of 1,500,000
18 Dth/day, hence is not yet fully contracted. While it is difficult to determine
19 whether a specific commitment for pipeline capacity was necessary to ensure
20 construction of the project, the pipeline would not have been developed without
21 contracts supporting a significant percentage of the proposed capacity. The DTE
22 Gas commitment represents 8.5 percent of the contracted capacity on the pipeline,
23 which was important in ensuring that the project would be developed.

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2) Contracting for capacity reduces DTE Gas natural gas supply portfolio expenditures. Because the cost of gas delivered via NEXUS is, on average, lower than the cost of gas delivered to the MichCon Citygate via alternative pipeline routes, holding NEXUS capacity reduces DTE Gas's gas expenditures beyond the savings attributable to the decline in the Citygate price.

Q. Have you quantified the benefits to DTE Gas of holding NEXUS capacity?

A. Yes, in the 2015 analysis, I quantified the natural gas cost savings that DTE Gas is likely to receive over the life of the contract if the gas delivered via NEXUS is used to displace gas and pipeline capacity purchased in other supply basins.

Based on the assessment of commodity prices and pipeline demand charges in the most aggressive pipeline capacity scenario considered— where both NEXUS and Rover are built and total pipeline capacity expansions from the Appalachian Basin into the Midwest reach 4.75 Bcfd— holding NEXUS capacity continues to provide significant benefits to DTE Gas customers. ICF's estimate of the additional savings arising from a revised purchasing pattern for each of the four pipeline capacity scenarios are shown in Table 3.

In the 2015 analysis, the savings start in the first year of the contract, and generally increase over time. Figure 2 provides a graphical representation of annual savings each year for the Rover and NEXUS and NEXUS only scenarios. The increase in annual savings is a result of the Base Case forecast of expanding Marcellus/Utica

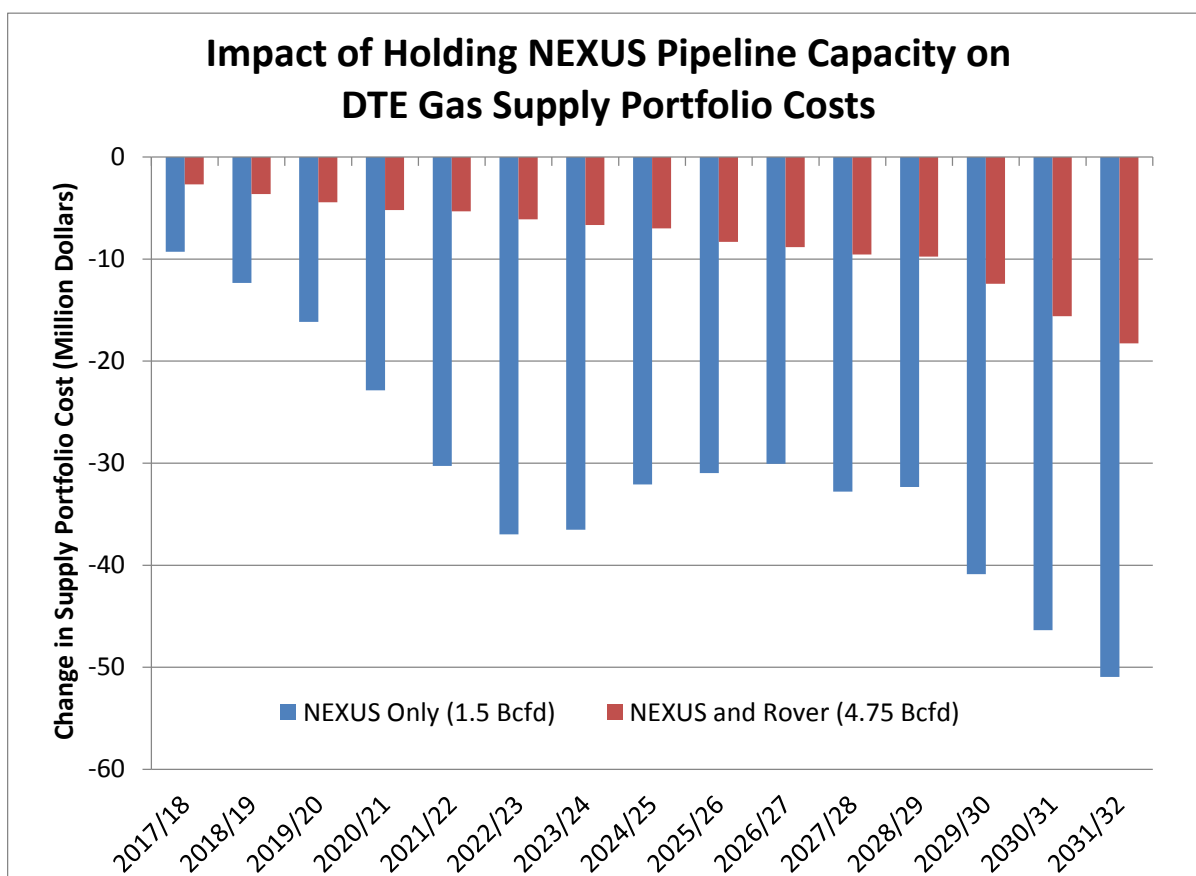
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production over time, leading to lower gas prices in the Appalachian basin relative to other sources of gas for DTE Gas.

Table 3: Impact of Contracting for 75,000 Dth/Day of NEXUS Pipeline Capacity on DTE Gas Supply Portfolio Costs

	DTE Gas Supply Portfolio Cost (Million \$)		Change in Supply Portfolio Cost Due to NEXUS (Million \$)	Annual Change in Supply Portfolio Cost Due to NEXUS (Million \$)
Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	Without The NEXUS Capacity Contract	With the NEXUS Capacity Contract		
NEXUS Without Rover	\$11,486	\$11,025	-\$461	-\$31
NEXUS With Rover	\$10,846	\$10,722	-\$124	-\$8
^{1/} November 2017 through October 2032.				
^{2/} Including gas purchase costs, pipeline capacity costs, pipeline commodity costs, and pipeline fuel costs.				

Figure 2: Impact of NEXUS on Annual DTE Gas Supply Portfolio Costs



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Q. Are the benefits accruing to DTE Gas customers and to Michigan gas consumers due to the impact of the development of pipeline capacity from the Appalachian Basin into Michigan on natural gas prices, and the benefits to DTE Gas customers of holding capacity on NEXUS cumulative?

A. Yes. When the benefits of holding 75,000 Dth/day of pipeline capacity on NEXUS are added to the gas cost savings associated with the increase in pipeline capacity from the Appalachian Basin to Michigan resulting from the construction of NEXUS, the total reduction in gas supply portfolio costs for DTE Gas customers ranges from \$375 million to \$847 million, and the total cost savings to all Michigan gas consumers ranges from \$1.7 billion to \$2.9 billion, depending on whether or not Rover pipeline is included in the analysis. The total impact of new pipeline capacity from the 2015 study is shown in Table 4.¹²

Table 4: Total Impact of NEXUS Pipeline Capacity from Eastern Ohio into Michigan on Michigan Natural Gas Supply Costs^{1,2}

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Gas Customers (Million \$)	All Michigan Consumers (Million \$) ¹³
NEXUS Without Rover	-\$847	-\$2,916
NEXUS With Rover	-\$375	-\$1,719
^{1/} November 2017 through October 2032.		
^{2/} Includes the impact of 75,000 Dth of NEXUS Capacity in the DTE Gas supply portfolio as well as the impact of the NEXUS Pipeline.		
^{3/} DTE Gas supply portfolio represents 15.7 percent of total Michigan natural gas purchases.		

¹² The benefits to Michigan consumers do not include potential benefits from parties other than DTE Gas that might also hold capacity on NEXUS.

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1 **Q. How did the 2015 analysis differ from the 2014 Analysis?**

2 A. The 2014 analysis and 2015 analysis were conducted using the same basic
3 methodology. In both reports, ICF concluded that NEXUS would reduce natural gas
4 costs in Michigan, and benefit DTE Gas customers. The 2015 report suggested that
5 the value of the NEXUS pipeline would be somewhat higher than indicated in the
6 2014 report, due to a slightly higher average basis between the Marcellus/Utica and
7 the MichCon citygate. However, while the numerical results differed between the
8 2014 and 2015 analysis due to changes in market conditions, the general conclusions
9 were unchanged.

10

11 **Q. Have there been any fundamental changes in natural gas markets since the most**
12 **recent ICF Report prepared for DTE Gas was prepared?**

13 A. Yes. The most recent ICF Report prepared for DTE Gas was based on analysis
14 completed in Q3 2015, and there have been several significant changes in natural gas
15 markets since then, including:

16

17 1) **Increased outlook for Marcellus/Utica production growth continues despite**
18 **low prices** – Following low prices in late 2015 and 2016, which saw prices at
19 Dominion South Point dip below \$1.00/Dth at certain points, and low oil and
20 NGL prices, gas drilling declined sharply in the Northeast region. Despite this
21 slow-down in drilling activity, Marcellus/Utica production has been remarkably
22 resilient and was one of the first gas plays to experience an uptick in drilling
23 activity in 2017. The continued resiliency in production and recovery in drilling
24 activity both indicate that the low cost of the Marcellus/Utica gas resource will
25 help maintain gas production even in a low gas price environment. While near

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1 term production from the Marcellus and Utica has grown slower than initially
2 forecasted in the ICF Report due to pipeline delays and lower gas prices, ICF's
3 current projection for Marcellus/Utica production calls for higher production
4 levels beginning in 2019 relative to our projection in the initial ICF Report. The
5 combination of low cost supplies with continued constraints on outbound pipeline
6 capacity make it likely that significant long term basis spreads between the
7 Marcellus/Utica and downstream markets will persist.

8
9 **2) Changes in Marcellus/Utica-related pipelines** – There have been a number of
10 changes in industry planning regarding pipeline capacity out of the
11 Marcellus/Utica including new pipeline approvals and pipeline delays and
12 cancellations.

13
14 A number of pipelines that would provide additional downstream capacity to
15 move gas out of the Marcellus/Utica have been either canceled or delayed.
16 Kinder-Morgan's Northeast Energy Direct (NED) was canceled due to
17 insufficient shipper interest. Enbridge's Access Northeast (ANE) project has been
18 withdrawn due to regulatory hurdles following the ruling by the Massachusetts
19 Supreme Court that effectively blocks shipping contracts by electric distribution
20 companies. Constitution Pipeline has not received a needed water permit and
21 environmental certification from the New York State Department of
22 Environmental Conservation and has requested a two-year extension to their
23 FERC application.

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1 National Fuel's Northeast Access 2016 project, which was already delayed by
2 one year, was also denied a water permit by New York and faces continued
3 challenges from environmental groups in New York and Pennsylvania while a
4 third pipeline, PennEast Pipeline, was denied a water permit by the New Jersey
5 DEP. Mountain Valley Pipeline and Atlantic Coast Pipeline (two separate
6 projects aimed at providing southern states with greater access to Marcellus
7 supplies) are both facing opposition from Virginia land owners and
8 environmental groups, and at a minimum will be delayed by one to two years
9 from their original proposed schedule. The in-service date for the Rover Pipeline
10 has been delayed by about six months and the in-service date for the NEXUS
11 pipeline has been delayed by six months to a year.

12
13 In general, these cancellations and delays will constrain the ability to move gas
14 from Marcellus/Utica to downstream markets, thereby resulting in lower prices
15 in this key gas supply area. Additionally, since two major projects (NED and
16 ANE) to provide incremental capacity to New England are not moving forward,
17 New England will continue to rely on gas received via Canada (e.g., into the
18 Portland Natural Gas Transmission System (PNGTS) via New Hampshire) for a
19 portion of its supplies, which is expected to increase demand for gas delivered
20 into Ontario from Michigan. Given the level of opposition to new pipeline
21 construction, additional delays and cancelations are possible in the future.

22
23 Offsetting the delays and cancelations, several pipeline projects from the
24 Marcellus/Utica, primarily to the Gulf Coast and the Southeast, have moved
25 closer to implementation and are now included in ICF's projections. These

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1 include the Rayne Express/Leach Express, WB Express, the Mountain Valley
2 Pipeline, and the Panhandle Backhaul project.

3
4 **3) New Pipeline Developments Impacting Michigan and Midwestern Gas**

5 **Markets** – There have been several new project developments that will further
6 increase deliveries of gas into the Midwestern market area or will increase the
7 capabilities of the pipeline system in the region. Vector is expanding capacity into
8 Dawn in conjunction with NEXUS and Rover with an increase in winter capacity
9 of 277,000 Dth/d into Dawn and an increase in summer capacity of 562,009 Dth
10 into Dawn, Ontario, and Chicago, IL once the two pipelines are in service.
11 Alliance Pipeline has announced that it is considering a 0.5 Bcfd compression
12 expansion on the Alliance system from Alberta to the Aux Sable processing plant
13 near Chicago. ANR Pipeline's proposed Wisconsin South Expansion Project
14 would expand deliverability on the ANR system into Northern Illinois and
15 Wisconsin by 230,950 Dth/Day, with an announced in-service date of November
16 2018.

17
18 In February 2017, TransCanada announced an open season for Dawn Long Term
19 Fixed Price (LTFP) Service. The service was approved by the Canadian National
20 Energy Board (NEB) in September 2017. The 10-year, non-renewable service is
21 designed to increase deliveries on the company's Mainline system into the Dawn
22 market area. ICF expects the TransCanada LTFP service to flow relatively full
23 with limited seasonality over the 10-year contract period. This service will
24 increase the deliveries of Western Canadian gas supplies into the Dawn market
25 area, thereby resulting in somewhat higher AECO prices and somewhat lower

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prices in Dawn and Eastern Ontario. These projects do not materially change ICF's views on the need to additional pipeline capacity out of the Marcellus/Utica area.

4) Lower growth in LNG exports – A weaker outlook for global LNG markets has led ICF to lower its near term projection for U.S. LNG exports. U.S. exports are currently projected to reach 9.5 Bcfd by 2025, versus 11.6 Bcfd in the ICF Report. The reduction in near-term LNG exports, which are concentrated along the Gulf Coast, places less upward pressure on Henry Hub prices in the near term. In the longer term, ICF has increased its projections of LNG exports, with an expected six terminals built in the U.S., reflecting revisions to our views on the competitiveness of U.S. LNG exports in the international market.

ICF has also reduced expectations for LNG export development from British Columbia. ICF no longer considers it likely that a major LNG export facility will be developed in British Columbia prior to 2035, thereby reducing demand for natural gas in British Columbia in 2035 by about 3.5 Bcfd relative to our earlier forecasts.

5) Faster growth in U.S. exports to Mexico – Mexico's Federal Electricity Commission (CFE) has contracted for capacity on six new U.S. pipelines to increase access to U.S. gas supplies to support the growth of gas-fired electricity generation in Mexico. Exports to Mexico have increased at a faster pace than initially forecasted in 2015, and is expected to average 4.2 Bcfd in 2017. Additionally, ICF now forecasts an increase in Mexico exports over the long-term relative to the ICF Report projection.

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6) Stronger growth in gas demand for electricity generation – In 2016, natural gas for the first time accounted for a larger share of electric generation than coal with natural gas accounting for 33.8% of 2016 energy production. Prompted in part by continued low gas prices and above average summer temperatures, power sector gas demand has increased at an accelerated pace over the past year. Power sector gas demand will continue to increase as gas continues to displace coal-fired generation. ICF currently expects U.S. power generation gas demand to grow by an additional 1 Bcfd by 2020 as compared to the forecast in the 2015 report. In Michigan, natural gas consumed for power generation during the first half of 2017 averaged 504,000 Mcfd, a 12.5% increase compared to same period in 2015, but down from levels in 2016.¹³ Increasing gas demand from the power sector in Michigan will increase the value of new pipeline capacity into the state.

14

15

7) Changes in TransCanada tolling from Empress to Dawn – The TransCanada LTFP toll from Empress to Dawn was approved by the Canadian NEB in October of 2017, and took effect on November 1, 2017. This new toll reduced the cost of TransCanada capacity between these two points and resulted in about 1.5 Bcfd of contracted capacity directly from Empress to Dawn for a 10 year period ending in 2029. The increase in direct deliveries of Alberta natural gas to Dawn has impacted natural gas prices at Dawn and in other markets impacted by Dawn, including Michigan markets.

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¹³ Source: U.S. Energy Information Administration:
https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SMI_m.htm

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1 **Q. What impact would additional pipeline capacity additions out of**
2 **Marcellus/Utica have on your assessment of NEXUS benefits?**

3 A. All things being equal, additional take-away from the Marcellus/Utica likely results
4 in an increase in Marcellus/Utica gas prices over the near-term. However, this near-
5 term price increase relative to nearby market centers will incentivize producers to
6 increase production further, thereby reducing prices again. This is due to the large
7 amount of low-cost gas resource available in the Marcellus/Utica and the highly
8 reactive nature of gas supplies to price signals with the rise of unconventional natural
9 gas development.

10

11 **Q. Have you provided an updated 2015 ICF Report to DTE Gas?**

12 A. No. DTE Gas did not request an update to the 2015 ICF Report.

13

14 **Q. Has ICF's long-term view on the basis between MichCon Citygate and**
15 **Marcellus/Utica gas supplies at Kensington, OH substantially changed since the**
16 **2015 ICF report was prepared?**

17 A. No. The fundamental long-term drivers of the basis have not changed significantly.
18 Due to the continued strong gas production growth in the Marcellus/Utica and low-
19 cost nature of supply in the region, ICF continues to expect there to be a significant
20 and lasting long-term price differential between MichCon Citygate prices and supply
21 prices in the Marcellus/Utica production regions at a level sufficient to justify the
22 inclusion of NEXUS capacity in the DTE Gas supply portfolio.

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1 **Q. Can you explain why relatively significant changes in the Outlook for**
2 **Marcellus/Utica production and the other changes in natural gas market**
3 **outlook do not lead to a fundamental change in the average basis spread from**
4 **Kensington to the MichCon Citygate?**

5 A. Basis spreads, particularly between production areas and market centers, are driven
6 by the combination of the supply fundamentals in the specific producing region,
7 demand fundamentals of the market area, alternative sources of supply available to
8 the market area (including if there is excess deliverability into the market), and the
9 pipeline capacity between the regions. The basic change in ICF's forecast relative to
10 the original studies is an increase in Marcellus/Utica production over time. This
11 increase leads to continued incentives to build additional pipeline take-away
12 capacity. As long as the potential for growth in production continues, the basis spread
13 out of the region will need to be sufficient to support incremental pipeline
14 development.

15

16 ICF expects that, as a general rule, lower cost pipeline capacity expansion
17 opportunities into specific markets will be developed first, with higher cost options
18 delayed until later. In the case of production from the Marcellus/Utica, most of the
19 lower cost pipeline expansion projects have already been developed or are currently
20 being developed. These options include the optimization of existing pipeline
21 capacity, and the reversal of the original long-haul pipelines from the Gulf Coast into
22 the Midwest and Northeast US.

23

24 After these lower cost pipeline options are developed, the cost of future pipeline
25 construction from the Marcellus/Utica to the Midwest and other markets will

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1 increase. As a result, future pipeline expansions are expected to be at least as
2 expensive as the development of Rover and NEXUS. Hence the cost of building
3 incremental pipeline capacity out of the Marcellus/Utica is expected to remain
4 relatively high over a wide range of potential Marcellus/Utica growth scenarios, and
5 the basis spread between the production area and delivered markets is likely to remain
6 generally high.

7

8 **Q. Given that, at this point, it appears nearly certain that the NEXUS Pipeline will**
9 **be brought into service in 2018, do you still support the inclusion of NEXUS**
10 **Pipeline Capacity in the DTE Gas natural gas supply portfolio?**

11 A. Yes. The DTE Gas contracts with NEXUS have been important in supporting the
12 development of the NEXUS Pipeline, and have contributed to creating the value that
13 the existence of the NEXUS Pipeline will bring to Michigan natural gas markets.

14

15 In addition, given the natural gas production growth potential in the Marcellus and
16 Utica basins, and the costs and challenges associated with developing additional
17 pipeline capacity to move natural gas from this production region to downstream
18 demand markets, I expect the long-term basis between the Marcellus and downstream
19 markets to strengthen over time, and for NEXUS to provide a cost effective source
20 of natural gas to DTE Gas customers relative to natural gas sourced from other
21 producing regions.

22

23 **Q. Does this complete your direct testimony?**

24 A. Yes, it does.

In the matter of the Application of)
DTE Gas Company for approval of a)
Gas Cost Recovery Plan, 5-year Forecast, and)
Monthly GCR Factor for the 12 months ending)
March 31, 2019)
_____)

MICHAEL D. SLOAN

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EDUCATION

B.A., Economics, Policy Studies/Operations Research, Dartmouth College, Hanover, NH, 1983

EXPERIENCE OVERVIEW

Mr. Sloan is a Managing Director for ICF's Natural Gas and Liquids Advisory Services Group. He has more than 35 years of experience in the energy field. His primary work areas include analysis of propane and natural gas liquid and petrochemical markets and demand, analytical and regulatory support for gas utilities, natural gas storage valuation and assessment, natural gas and propane asset valuation, analysis of propane and natural gas liquid and petrochemical markets and demand, and market due diligence for asset sales, acquisitions, and financing. He has worked extensively on Canadian natural gas market and regulatory issues.

Mr. Sloan provides in-depth analytical and regulatory support for natural gas utilities on issues related to natural gas storage, transmission, and distribution. His responsibilities include economic analyses of facility expansion projects, market assessments for corporate acquisitions, estimation of economic damages in litigation cases, and strategic analysis of regulatory issues. Areas of expertise include natural gas price volatility and liquidity, natural gas price determination, natural gas storage issues, natural gas avoided costs and evaluation of long-term economic impacts of major transmission pipeline expansion projects.

Mr. Sloan is a frequent speaker at natural gas and propane conferences and association board meetings, and has testified on a variety of issues related to natural gas storage market power, natural gas storage economics, natural gas storage land owner issues, pipeline facility expansion economics, and natural gas market liquidity. He has also submitted testimony to the FERC on natural gas liquidity issues in California, and to the Minnesota District Court on propane market economics and pricing practices.

PROJECT EXPERIENCE

Selected Natural Gas Industry Analysis and Regulatory Support

2015 Ontario Natural Gas Market Review: Assessing Ontario Natural Gas Market Requirements. January 2016. Mr. Sloan completed a detailed assessment of Ontario natural gas market requirements for Union Gas Limited, and presented the conclusions of the assessment to the Ontario Energy Board ("OEB") during the OEB 2016 Natural Gas Market Review.

Analysis of the Value of Nexus Pipeline Capacity to DTE Gas Customers. December 2015. Mr. Sloan completed a detailed assessment of the value of holding Nexus pipeline capacity on DTE Gas customers for DTE Gas. The assessment concluded that holding Nexus Pipeline capacity would provide long term benefits to DTE Gas customers.

Analysis of the Value of Nexus Pipeline Capacity on Michigan Energy Markets. November 2015. Mr. Sloan completed a detailed assessment of the value of holding Nexus pipeline capacity on Michigan Energy Markets for DTE Electric. The assessment concluded that holding Nexus Pipeline capacity would provide long term benefits to DTE Electric customers.

Analysis of Union Gas Avoided Costs. For Union Gas, Mr. Sloan prepared an assessment of the Union Gas estimates of avoided costs used to evaluate DSM programs. The assessment included recommendations for revisions to the avoided cost estimation methodology.

Analysis of Impact of Changing North American Supply and Demand on Union Gas Pipeline Facilities. September 2014. For Union Gas, Mr. Sloan prepared an assessment of the impact of natural gas market changes on planned Union gas facilities. The assessment concluded that new Union Gas facilities would continue to be used and useful for the foreseeable future.

Analysis of the Impact of Changing Natural Gas Market Conditions on ATCO Pipelines Market Risk. January 2014. On behalf of ATCO Pipelines, Mr. Michael D. Sloan completed an assessment of the impact of recent natural gas market changes on ATCO Pipeline market risk. The assessment reviewed the changes in natural gas supply and transportation on market risks for shippers and customers in Alberta.

Analysis of Natural Gas Market Outlook and Options for Gaz Metro, Quebec, Canada, 2013. Mr. Sloan completed an assessment of natural gas market conditions including expected pipeline flows and constraints impacting the Gaz Metro supply planning.

Analysis of Value of Proposed Natural Gas Storage Facilities 2013: Mr. Sloan used his storage valuation model to evaluate the potential value of contracting for capacity on a proposed storage facility for Heritage Gas, Nova Scotia Canada.

Analysis of Natural Gas Supply Options, Centra Manitoba Gas Company – a Division of Manitoba Hydro, 2010 -2012: Mr. Sloan prepared a detailed assessment of natural gas supply options for Centra Manitoba Natural Gas. The review included detailed assessment of customer demand patterns relative to industry standards, availability and likely costs of alternative supply strategies capable of meeting demand. The assessment also included evaluation of the clients' current facility contracts, and recommendations for future natural gas facility development and contracting practices. The review includes an assessment of likely pipeline flows and tariffs on the TransCanada Pipeline system.

Storage Market Concentration, Union Gas Limited, 2005 – 2006: On behalf of Union Gas, Mr. Sloan evaluated natural gas storage market concentration and natural gas storage market power in Ontario and the Great Lakes Basin. His report included an assessment of the workably competitive market region for Union Gas storage based on an analysis of market liquidity, connectivity, and market concentration. Mr. Sloan also testified before the Ontario Energy Board on behalf of Union Gas Limited on these issues. At the conclusion to this proceeding the Ontario Energy Board deregulated more than 50 Bcf of Union Gas Storage.

Analysis of Natural Gas Commodity Options, Centra Manitoba Gas Company – a Division of Manitoba Hydro, 2006 -2007: Mr. Sloan prepared a detailed assessment of natural gas commodity issues and trends influencing natural gas commodity purchases for Centra Manitoba Natural Gas. The review included detailed assessment of customer demand patterns relative to industry standards, availability and likely costs of alternative supply strategies capable of meeting demand. The assessment also included evaluation of the clients' current commodity purchasing agreements, and recommendations for future natural gas commodity purchasing practices.

Analysis of Optimum Storage Utilization, MichCon Gas, 2006, 2008, 2011: Since 2006, Mr. Sloan has prepared a series of analyses of the optimum storage utilization for the MichCon Gas local distribution company business to support MichCon regulatory proceedings related gas supply costs and storage utilization. The analyses evaluated the value of existing MichCon gas storage to LDC customers based on different weather patterns and usage scenarios.

Analysis of Value of Proposed Natural Gas Storage Facilities to Nova Scotia Power and Light (NSPI) – 2008: Mr. Sloan used his storage valuation model to evaluate the potential value of contracting for capacity on a proposed storage facility to NSPI.

Analysis of the Impact of LNG on Natural Gas Markets in Quebec, Rabaska Limited, 2005 – 2006: Mr. Sloan prepared a detailed analysis and forecast of the likely impacts of an LNG import facility located in Quebec on local, regional, and US and Canadian natural gas markets. The analysis concluded that the facility would substantially reduce natural gas prices in the region, and increase supply options and supply reliability. The report was filed with the Canadian Environmental Assessment Agency by Rabaska Limited as part of the facility approval process.

Analysis of Natural Gas Market Liquidity at Points Affecting New York State LDC's, Northeast Gas Association, 2003: Mr. Sloan co-authored a major study of natural gas market liquidity for the Northeast Gas Association to identify liquid markets for natural gas commodity purchases. The study included development of new approaches to evaluating market liquidity in the Northeastern U.S., and identified market centers that could be considered sufficiently liquid to provide a reliable source of natural gas.

Analysis of Natural Gas and Energy Price Volatility, for the American Gas Foundation and the Oak Ridge National Laboratory, 2003: Mr. Sloan managed a major study and co-authored a report on natural gas and energy price volatility for the American Gas Foundation.

Multi-Client Study, American Gas Association and Interstate Natural Gas Association of America: Mr. Sloan conducted the analysis, and co-authored the report “Short-term Natural Gas Markets” which was widely cited in FERC Order 637. The analysis was used by FERC to provide quantitative support for the removal of price caps in the short-term capacity release market

Propane Market Analysis

Propane Market Metrics Initiative, Propane Education and Research Council, 2003 – 2014: Mr. Sloan has managed a major project to collect and analyze propane market data for the Propane Education and Research Council (PERC). This effort has included consolidation and evaluation of all of the publicly available sources of data on propane demand in the U.S. The effort also includes a continuing assessment of the impact of major market trends on the propane industry, including changes in propane sales per customer over time, impact of price and weather on propane demand, changes in the residential new construction market for propane, analysis of competitive fuel sources, including electricity, fuel oil and natural gas. Mr. Sloan regularly presents results of his analysis to the PERC Board of Directors, and to other propane industry associations and companies.

Propane Market Forecast Model Development: Mr. Sloan managed the development and implementation of two major propane demand forecasting models for the PERC. The models provide the only publicly available forecasting capability at the State and County levels. The Propane Database and Forecasting Model (PDFM) provides State by State assessments of the total odorized propane market by end-use, including residential, commercial, on-road vehicle, industrial, and portable cylinder markets. The County Residential Propane Model (CRPM) provided propane markets with a customizable forecasting tool capable of evaluating residential demand on a county by county basis.

Assessment of Alternative Fueled Vehicle Potential, California Energy Commission, 2010. For this project, Mr. Sloan prepared an assessment of the market potential and market obstacles for propane vehicles in California.

Regulatory and Market Support, National Propane Gas Association, 2008 – 2014. Mr. Sloan provides market and regulatory analysis of issues influencing the propane industry for the National Propane Gas Association.

Assessment of the EIA Regional Residential Propane Model and Regional Residential Distillate Model, U.S. Energy Information Administration, 2006/2007. Mr. Sloan was asked by the EIA to peer review the EIA Residential Short Term Energy Model residential propane and distillate modules. The review included an in-depth review of the two modules, and recommendations to the EIA for model improvements.

Other Energy Supply and Demand Forecasting

Mr. Sloan has also supported and enhanced versions of the oil, natural gas and coal sectors for the MARKAL-MACRO model, the long-term, multi-period optimization model used by the U.S. DOE Policy Office for policy analysis and scenario evaluation of U.S. energy markets. In addition, Mr. Sloan has been responsible for the development and maintenance of a variety of energy forecasting models for the U.S. Department of Energy and the U.S. Environmental Protection Agency, including the World Energy Model (WOIL) and the IDEAS model used by the DOE Policy Office, and the Industrial Combustion Emissions (ICE) Model and the Industrial Fuel Choice Analysis Model (IFCAM) used by the EPA.

EXPERT TESTIMONY

1. Written evidence of Dr. Michael O Lerner and Michael D. Sloan, *Long term natural gas transmission expansion economics*, 1995. Mr. Sloan submitted written evidence and testified on behalf of Union Gas Limited before the Ontario Energy Board in EBRO 486. Mr. Sloan’s evidence concerned the long term economics of pipeline expansion on the Union Gas system.
2. Written evidence of Dr. Michael O Lerner and Michael D. Sloan, *Long term natural gas transmission expansion economics*, 1996. Mr. Sloan submitted written evidence and testified on behalf of Union Gas

Limited before the Ontario Energy Board in EBLO 251. Mr. Sloan's evidence concerned the long term economics of pipeline expansion on the Union Gas system.

3. "Written Evidence of Bruce B. Henning and Michael D. Sloan", TransCanada PipeLines Limited, Hearing Order RH-1-2002 (dated May 2002). Mr. Sloan submitted written evidence before the National Energy Board on behalf of Enbridge Gas Distribution Inc., Societe En Commandite Gaz Metro, and Union Gas Limited. Mr. Sloan's written evidence concerned the proposed establishment of the Southwest Zone and its impact on market liquidity.
4. "Analysis of FERC Staff Report Investigating California Natural Gas and Electricity Prices", San Diego Gas & Electric Co., Docket Nos. EL00-95-045 and EL00-98-42, prepared by Bruce B. Henning and Michael Sloan, (dated October 15, 2002) and submitted on behalf of Energy and Environmental Analysis, Inc. ("EEA") before the Federal Energy Regulatory Commission ("FERC"). Mr. Sloan's report concerned issues related to FERC's investigation of natural gas and electricity prices.
5. "Written Evidence of Bruce B. Henning and Michael D. Sloan on Behalf of Union Gas Limited", Hearing Order RP-2000-0005 (dated October 29, 2003). Mr. Sloan submitted written evidence on behalf of Union Gas Limited before the Ontario Energy Board. Mr. Sloan's written evidence addressed issues related to the compensation of landowners for the use of natural gas storage pools located on their property.
6. "Written Evidence of Bruce B. Henning and Michael D. Sloan", TransCanada PipeLines Limited, Hearing Order RH-3-2004 (dated June 21, 2004). Mr. Sloan submitted written evidence and testified before the National Energy Board on behalf of Enbridge Gas Distribution Inc., Societe En Commandite Gaz Metro, and Union Gas Limited.
7. Report "The Impact of Rabaska LNG Imports on Quebec and Ontario Natural Gas Markets", authored by Bruce B. Henning and Michael Sloan (dated November 2005) and submitted on behalf of Rabaska Limited Partnership before the Canadian Environmental Assessment Agency.
8. Report "Analysis of Competition in Natural Gas Storage Markets For Union Gas Limited." 2006. Authored by Bruce B. Henning, Michael D. Sloan, and Richard Schwindt and submitted before the Ontario Energy Board Natural Gas Electricity Interface Review EB-2005-0551. 2006. Mr. Sloan testified on behalf of Union Gas Limited before the Ontario Energy Board of Canada.
9. Report "Storage Planning and Optimization for MichCon GCR Customers", December 2007. Authored by Bruce B. Henning and Michael D. Sloan and submitted on behalf of MichCon before the Michigan Public Service Commission U-15451.
10. Report "Assessment of Natural Gas Commodity Options for Centra Gas Manitoba". February 2009. Authored by Bruce B. Henning and Michael D. Sloan and submitted on behalf of Centra Gas Manitoba before the Manitoba Public Utilities Board.
11. Report "Dawn Gateway Pipeline Expansion Project: Market Fundamentals and Market Impact of Project Construction". Authored by Bruce B. Henning and Michael D. Sloan and submitted on behalf of Union Gas before the Canada National Energy Board.
12. Expert witness report "Opinions and Report on Propane Markets and Prices in Minnesota Related to Minnesota Attorney General Counterclaim and Answer". February 2011. Authored by Mr. Michael D. Sloan and submitted on behalf of Ferrellgas, L.P. before the State of Minnesota District Court, Second Judicial District.
13. Report "ICF 2011 Addendum to the 2007 ICF Report: Storage Planning and Optimization for MichCon GCR Customers", December 2011. Authored by Bruce B. Henning and Michael D. Sloan and submitted on behalf of MichCon before the Michigan Public Service Commission U-16921.
14. Report "Impact of Changing Supply Dynamics on the Ontario Natural Gas Market", January 30, 2013. Authored by Mr. Bruce B. Henning, Mr. Michael D. Sloan, and Ms. Briana Adams, and submitted on behalf of Union Gas Limited before the Ontario Energy Board in EB-2013-0074.
15. Report "Review of Natural Gas Pipeline Market Activity around the Dawn Hub". May 2013. Authored by Mr. Bruce B. Henning and Mr. Michael D. Sloan and submitted on behalf of Gaz Métro before the Quebec Public Utilities Board.
16. Expert Witness Report and Testimony "Impact of Changing Natural Gas Market Conditions on ATCO Pipelines Market Risk". January 2014. Authored by Mr. Michael D. Sloan and submitted on behalf of

ATCO Pipeline before the Alberta Utilities Board. Mr. Sloan testified on behalf of ATCO Pipelines before the Alberta Utilities Board.

17. Expert Witness Report and Testimony “Updated Assessment of Alton Natural Gas Storage”, July 2014, Authored by Mr. Leonard Crook and Mr. Michael Sloan and submitted on behalf of Heritage Gas Limited before the Nova Scotia Utility and Review Board. Mr. Sloan testified on behalf of Heritage Gas before the Nova Scotia Utility and Review Board.
18. Expert Witness Report and Testimony “Impact of Changing North American Supply and Demand on Union Gas Pipeline Facilities”, September 2014. Authored by Mr. Michael D. Sloan and submitted on behalf of Union Gas Limited before the Ontario Energy Board.
19. Expert Witness Report “Evaluation of Union Gas Avoided Costs”, December 2014, Authored by Michael D. Sloan and submitted on behalf of Union Gas Limited before the Ontario Energy Board in Case No. EB-2015-0029. Mr. Sloan testified on behalf of Union Gas Limited before the Ontario Energy Board.
20. Expert Witness Report and Testimony “The Value of Nexus Pipeline Capacity to DTE Gas Customers”, December 2014, Authored by Michael D. Sloan and submitted on behalf of DTE Gas before the Michigan Public Service Commission in Case No. U-17691. Mr. Sloan testified on behalf of DTE Gas before the Michigan Public Service Commission.
21. Expert Witness Report “Impact of Natural Gas Market Trends on Utilization of the Union Gas Dawn Parkway System”, June 30, 2015. Authored by Mr. Michael D. Sloan and submitted on behalf of Union Gas Limited before the Ontario Energy Board.
22. Expert Witness Report and Testimony “Impact of the Nexus Pipeline on Michigan Energy Markets”, November 2015, Authored by Michael D. Sloan and Maria Scheller and submitted on behalf of DTE Electric before the Michigan Public Service Commission in Case No. U-17920. Mr. Sloan testified on behalf of DTE Gas before the Michigan Public Service Commission.
23. Expert Witness Report and Testimony “The Value of Nexus Pipeline Capacity to DTE Gas Customers”, December 2015, Authored by Michael D. Sloan and submitted on behalf of DTE Gas before the Michigan Public Service Commission in Case No. U-17941. Mr. Sloan testified on behalf of DTE Gas before the Michigan Public Service Commission.
24. Expert Witness Report “2015 Ontario Natural Gas Market Review: Assessing Ontario Natural Gas Market Requirements”, January 2016. Authored by Mr. Michael D. Sloan and submitted on behalf of Union Gas Limited before the Ontario Energy Board. Mr. Sloan presented the results of the analysis to the Ontario Energy Board on behalf of Union Gas Limited.
25. Expert Witness Report and Testimony “Propane Market Trends in the Northeastern U.S. and Atlantic Canada”, January 2016, Authored by Michael D. Sloan and submitted on behalf of Heritage Gas before the Nova Scotia Utility and Review Board. Mr. Sloan testified on behalf of Heritage Gas before the Nova Scotia Utility and Review Board.
26. Expert Witness Testimony “Impact of the Nexus Pipeline on Michigan Energy Markets”, October 2016, Authored by Michael D. Sloan and submitted on behalf of DTE Electric before the Michigan Public Service Commission in Case No. U-18143. Mr. Sloan testified on behalf of DTE Electric before the Michigan Public Service Commission.
27. Expert Witness Testimony “The Value of Nexus Pipeline Capacity to DTE Gas Customers”, December 2016. Authored by Michael D. Sloan and submitted on behalf of DTE Gas before the Michigan Public Service Commission in Case No. U-18243. Mr. Sloan testified on behalf of DTE Gas before the Michigan Public Service Commission.
28. Expert Report “ICF Review of MNP Proposal for Irving Oil Load Retention Service”. Authored by Michael D. Sloan and submitted on behalf of Union Gas Limited before the Canada National Energy Board in Case RHW-001-2017.
29. Expert Report “Assessment of the Impact of the TransCanada Dawn LTFP Service Proposal on Natural Gas Markets”, Authored by Michael D. Sloan and submitted on behalf of Union Gas Limited before the Canada National Energy Board in Case RH-003-2017.

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EMPLOYMENT HISTORY

ICF

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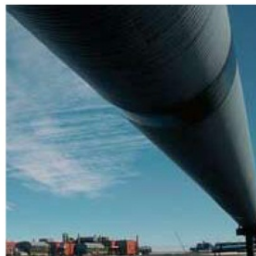
2016 - Present

DTE Gas Company
April 2018-2023
Curriculum Vitae for Michael D. Sloan

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Page No.: 8 of 8

ICF
Energy and Environmental Analysis, an ICF
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Project Manager to Principal 2007 – 2016
RA to Project Manager 1981-2006



The Value of Nexus Pipeline Capacity to DTE Gas Customers

December 15, 2014

**Submitted to:
Mr. Robert Lawshe
DTE Gas**

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1 Introduction

1.1 Purpose

ICF was engaged by DTE Gas Distribution (DTE Gas) to assess the value to DTE Gas customers of holding capacity on the proposed NEXUS Gas Transmission Project (NEXUS) from the Marcellus/Utica gas producing basins in eastern Ohio/Western Pennsylvania to the DTE citygate in Michigan. The assessment includes an independent evaluation of the value of holding capacity on the NEXUS pipeline to DTE Gas customers under a range of potential market conditions, as well as a comparison of the NEXUS pipeline to other competing pipeline proposals from the Marcellus/Utica region west to the Michigan and nearby markets.

NEXUS is a proposed pipeline that would connect the Marcellus and Utica plays in the Appalachian producing basin with upper Midwest and Canadian markets. The pipeline would consist of about 250 miles of large diameter pipe, capable of transporting up to 2 billion cubic feet per day (Bcfd) of gas. As shown on the map in Exhibit 4-1, the pipeline would begin in eastern Ohio and extend northwesterly to interconnect with the DTE Gas Transmission System and Vector pipeline. The pipeline will deliver natural gas produced in the Marcellus and Utica plays of the Appalachian Basin directly to gas markets in Michigan and Ontario. Of the several pipelines that are being proposed to bring Appalachian Basin gas to points on the interstate pipeline system capable of serving Michigan, NEXUS provides the most direct access to DTE Gas' system.

1.2 Rationale for the NEXUS Project

Fundamental changes in North American natural gas markets are driving DTE Gas' decision to contract for NEXUS capacity.

The shale gas revolution has greatly increased the availability of low cost natural gas supply. While there are economic shale gas plays in a variety of regions (including Western Canada, the Gulf Coast and the Mid-Continent), the majority of the production growth is expected to occur in the Marcellus and Utica shale plays in the Northeastern U.S., while many conventional natural gas producing regions are in decline.

On the demand side, the widespread availability of low cost natural gas is driving rapid growth in demand, primarily for power generation in the Mid-Atlantic and South Atlantic regions, industrial demand in the Gulf Coast, LNG exports, and exports to Mexico — primarily from the Gulf Coast. Natural gas demand in western Canada for oil sands production and LNG exports is also expected to increase

The shifts in the location of production and demand, as well as the rapid growth in production and demand are leading to a fundamental restructuring of the natural gas transportation and distribution system in North America. As a result, the shale gas revolution is resulting to

widespread changes in natural gas production and transportation patterns that are changing the economics of purchasing natural gas in different supply basins.

For utilities like DTE Gas that purchase natural gas from a variety of different sources, the changes in the market are driving significant rebalancing of natural gas supply portfolios, in order to reduce the risk associated with supply sources that may be in decline, and to adapt to the changes in supply basin costs resulting from the changes in the market.

1.3 Overview of Approach

ICF's assessment of the value of the NEXUS pipeline to DTE Gas customers is based on our views of these developments in North American natural gas markets. Our principal tool is the ICF Gas Market Model (GMM®). ICF prepares four GMM® Base Cases annually that guide our analysis of the markets. Each Base Case uses the latest information on gas production costs, consumer demand by sector by region, and pipeline system (including storage) infrastructure, to develop forecasts of future supply by region and type of supply, demand by sector and region, pipeline flows across North America, and prices at over 120 market locations in North America (Canada and the United States). Of special importance are the basis spreads between market locations (i.e., the price differences between two points on the system) that yield information about markets and pipeline infrastructure congestion. These forecasts are generated on a monthly basis through 2035. The GMM® results are provided to subscription clients and are used in as a foundation for special studies for clients, including in regulatory proceedings. For special studies such as this, ICF runs the model with different assumptions to evaluate the implications of different policies or proposed activities.

For this engagement, ICF used the GMM® to evaluate natural gas market conditions and prices that would result from different amounts of pipeline capacity built from the Appalachian Basin to Michigan, Ontario, and interconnects with other pipelines in the Midwest. Our Status Quo Case provided a "business as usual" expectation without any incremental pipeline capacity between the Appalachian Basin and the Midwest. ICF then re-ran the GMM® with increments of 1.5 Bcfd, 2.0 Bcfd, 3.25 Bcfd, and 4.75 Bcfd of pipeline expansions into the upper Midwest from the western Appalachian Basin (Marcellus and Utica plays in western Pennsylvania and eastern Ohio). The differences in the resulting prices and pipeline flows help to identify the benefits of the expansions to DTE Gas and Michigan consumers. A more complete description of the analysis is included in Section 5.

1.4 Structure of Report

Section 2 of this report provides a broad overview of ICF's long term natural gas market outlook, focusing on the changes in the North American natural gas markets likely to impact gas supplies in Michigan. In section 3, we look at the changes in gas supply and pipeline infrastructure in the Appalachian Basin, focusing on the areas that NEXUS would tap into. Section 4 provides a comparison of the alternative pipeline options between the Appalachian Basin and Michigan. Section 5 provides an assessment of the impact of the incremental pipeline capacity to Michigan

and DTE Gas consumers, and the value of contracting for Nexus pipeline capacity to DTE Gas customers. We also present the model outcomes of the various cases in Section 5.

2 North American Natural Gas Market Outlook

This section of the report provides an overview of ICF's North American natural gas market forecasts, starting with natural gas demand, including power generation, western Canadian developments, and end-use markets. Trends in North American supply sources are also discussed, including ICF's projections through 2035, the role of the Western Canadian Sedimentary Basin (WCSB) and unconventional production (such as the Marcellus), impact of production costs, and the apparent move toward natural gas liquids. The section then discusses LNG exports, pipeline flow issues, and natural gas price forecasts.

2.1 North American Demand

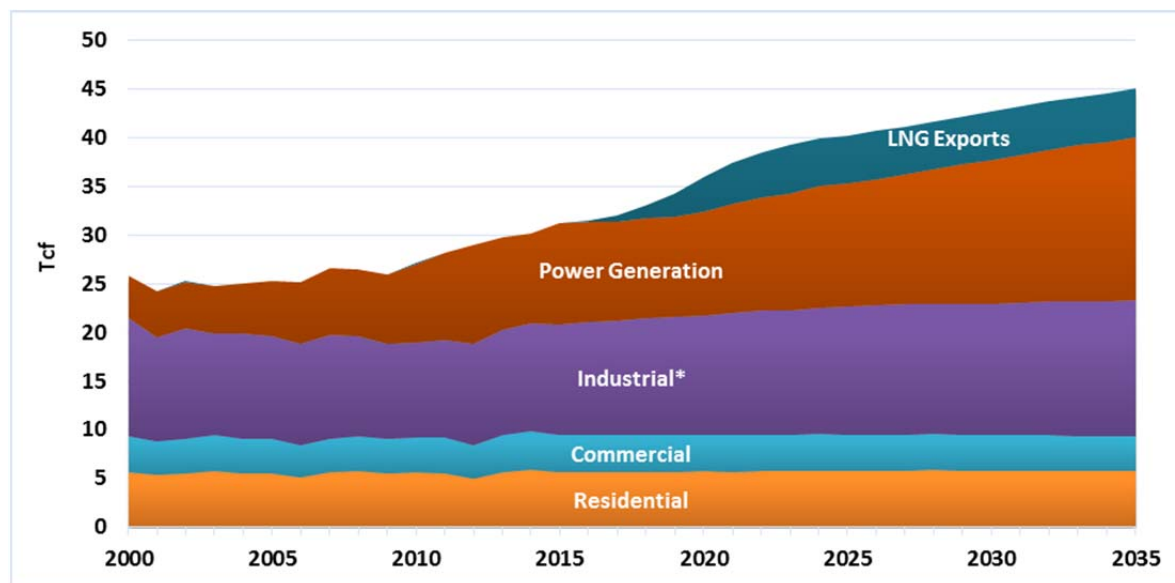
The power generation sector will be the major driver of incremental gas consumption in North America. Natural gas exports to Mexico and from the new LNG export facilities in the United States and Canada expected to come online starting in 2016 will increase natural gas demand significantly. ICF also forecasts some demand growth in the industrial sector, led by gas-intensive end uses such as petrochemicals, fertilizers, and transportation (i.e., compressed natural gas vehicles and LNG vehicles).

The projected market growth places upward pressure on gas prices. However, given the abundant resource available at relatively low prices, gas prices are only expected to grow modestly. ICF projects U.S. and Canadian gas production to grow from about 27 Tcf in 2010 to nearly 48 Tcf by 2035, an average annual growth rate of 2.2 percent per year (Exhibit 2-1). This growth is anticipated to come from unconventional production, while conventional onshore production is expected to decline. Small volumes of LNG imports will continue but are expected to comprise 0.4 percent of total U.S. and Canadian supplies in 2020. LNG remains important for the New England market, particularly in peak winter months when pipeline capacity into New England can become constrained. Overall, U.S. reliance on unconventional gas production, dominated by shale gas, is expected to grow. Many of the conventional supplies will become the marginal sources of gas supply in the future.

Incremental gas use by the power sector between 2013 and 2035 is expected to comprise 70 percent of total incremental U.S. and Canadian gas growth over the period. Power sector gas use will grow from 7.3 Tcf to 16.8 Tcf in 2035, driven by gas-fired power generation growth. There are a number of factors driving growth in gas demand for power generation. In the past 15 years, 460 gigawatts (GW) of new gas-fired generating capacity was built in the United States and Canada; much of that capacity is underutilized and readily available to satisfy incremental electric load growth. Electricity demand has historically been linked to Gross Domestic Product (GDP). Prior to the 2007-2008 global recession, demand for electricity was growing at about 2 percent per year. While GDP is forecast to grow at 2.6 percent annually over the next 20 years, electricity load growth is expected to average only about 1.2 percent per year, mainly due to implementation of energy efficiency measures. Even at this lower growth

rate, annual electricity generation is expected to increase to nearly 4.60 Terawatt-hours (TWh) per year by 2020, or growth of about 13 percent over 2010 levels (4,100 TWh annually).

Exhibit 2-1: U.S. and Canadian Gas Consumption by Sector and LNG Exports



Source: ICF GMM® November 2014.

* Includes pipeline fuel and lease & plant

The expanding use of natural gas in the power sector is driven in part by environmental regulations, primarily in the United States. The ICF Base Case assumes that all current air quality rules and regulations continue to apply. It also assumes that approximately 50 GW of coal capacity will retire in the next ten years, due to increasingly stringent U.S. Environmental Protection Agency (EPA) hazardous air pollutant regulations and relatively low natural gas prices. In addition to these regulations, The ICF Base Case reflects a likely outcome of EPA's proposals for major rules that have been drawing the attention of the power industry, including the Mercury & Air Toxics Standards Rule (MATS), water intake structures (often referred to as 316(b)), and coal combustion residuals (CCR, or ash). The Base Case also includes a charge on CO₂, reflecting the continuing lack of consensus in Congress and the time it may take for direct regulation of CO₂ to be implemented. The ICF Base Case generally leads to retirement and replacement of some coal generating capacity with gas-based capacity. ICF also assumes that all current state renewable portfolio standards are met and renewable generation grows at a rapid pace, but remains a relatively small portion of total generation. We also assume existing nuclear units have a maximum lifespan of 60 years, which will result in a small number of nuclear retirements by 2030, but a more significant impact thereafter as more units retire.

The ICF Base Case forecasts an increase in gas use in the power generation market from 30 percent of total U.S. and Canadian gas use in 2010 to 42 percent by 2035. Growth in gas-fired

generation and the accompanying growth in gas consumption is the primary driver of gas demand growth throughout the forecast period.

U.S. and Canadian industrial gas demand declines slightly over the forecast period to 35 percent in 2035, down from 36 percent in 2010. Despite the decline in total share of natural gas consumption, industrial gas use comprises 33 percent of the incremental increase in natural gas demand between 2010 and 2035. A large share of the industrial gas demand increase is from the development of the western Canadian oil sands. Excluding natural gas use for oil sands, the growth in industrial sector gas demand in the ICF Base Case is relatively small, as reducing energy intensity (i.e., energy input per unit of industrial output) remains a top priority for manufacturers.

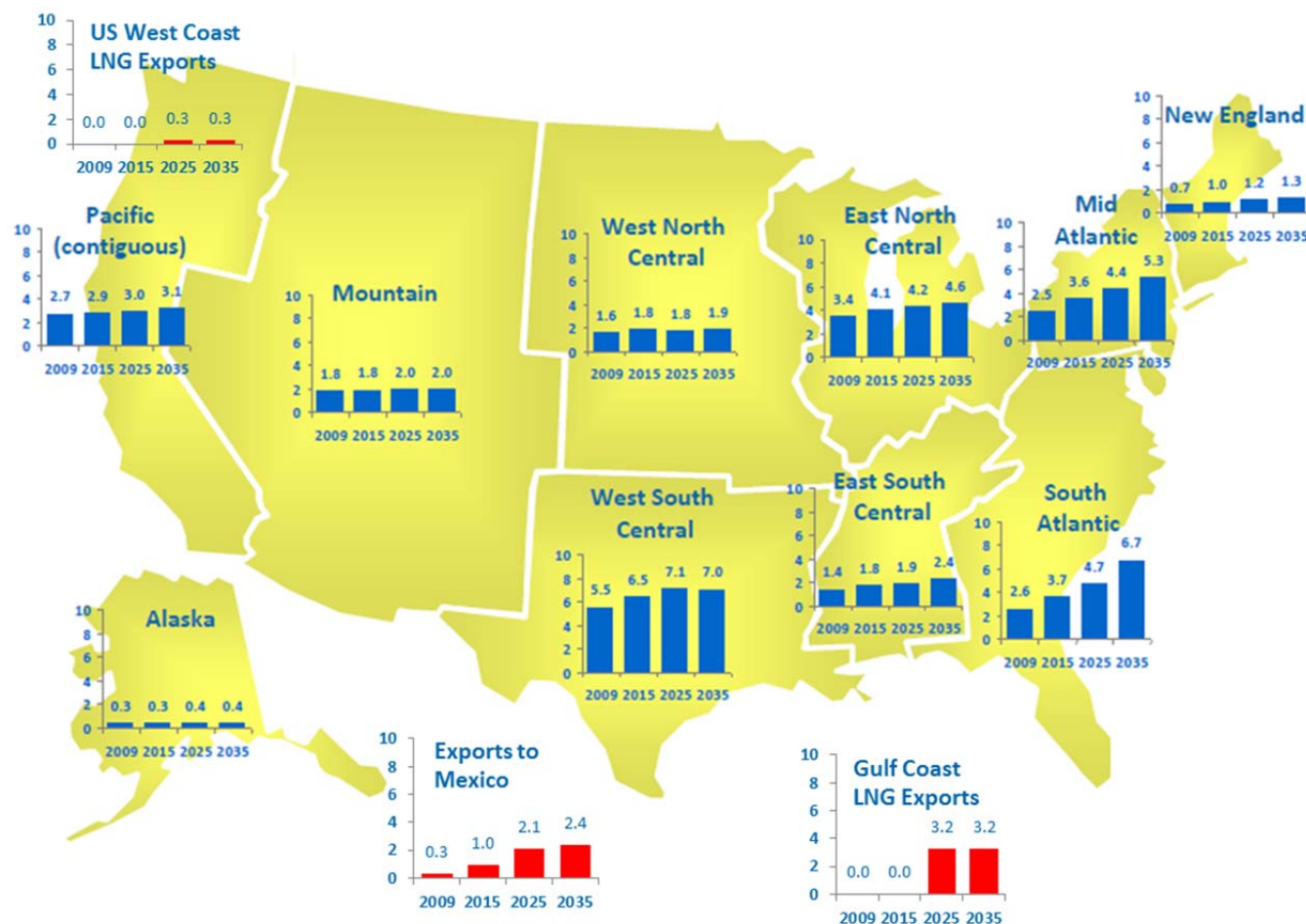
Gas demand growth in other sectors will be much slower than in the power sector. Residential and commercial gas use is driven by both population growth and efficiency improvements. Energy efficiency gains lead to lower per-customer gas consumption, thus somewhat offsetting gas demand growth in the residential and commercial sectors, which lead to lower per-customer gas consumption. Gas use by natural gas vehicles (NGVs) is included in the commercial sector. The ICF Base Case assumes that the growth of NGVs is primarily in fleet vehicles (e.g., urban buses), and vehicular gas consumption is not a major contributor to total demand growth.

2.1.1 Regional Demand Growth in the U.S.

The U.S. gas market is expected to grow across all regions, with the largest incremental demand growth in the southern and northeastern markets. These markets grow as more gas is used in power generation and in the Gulf Coast states, growth in industrial feedstock uses of natural gas in the petrochemical complex. Western markets will see less expansion of gas consumption.

Looking at the East North Central region (Michigan, Ohio, Indiana, Illinois and Wisconsin), our forecast is for gas demand to grow by about 1.0 Tcf between 2010 and 2035. Current consumption in the region (2014) is about 11.3 Bcfd (4.1 Tcf), with ICF forecasting that by 2035 the consumption could reach 12.5 Bcfd (4.6 Tcf). Much of this growth would come from power generation as coal plants are retired and replaced with natural gas-fired generation.

Exhibit 2-2: Regional Natural Gas Demand Growth (Tcf)

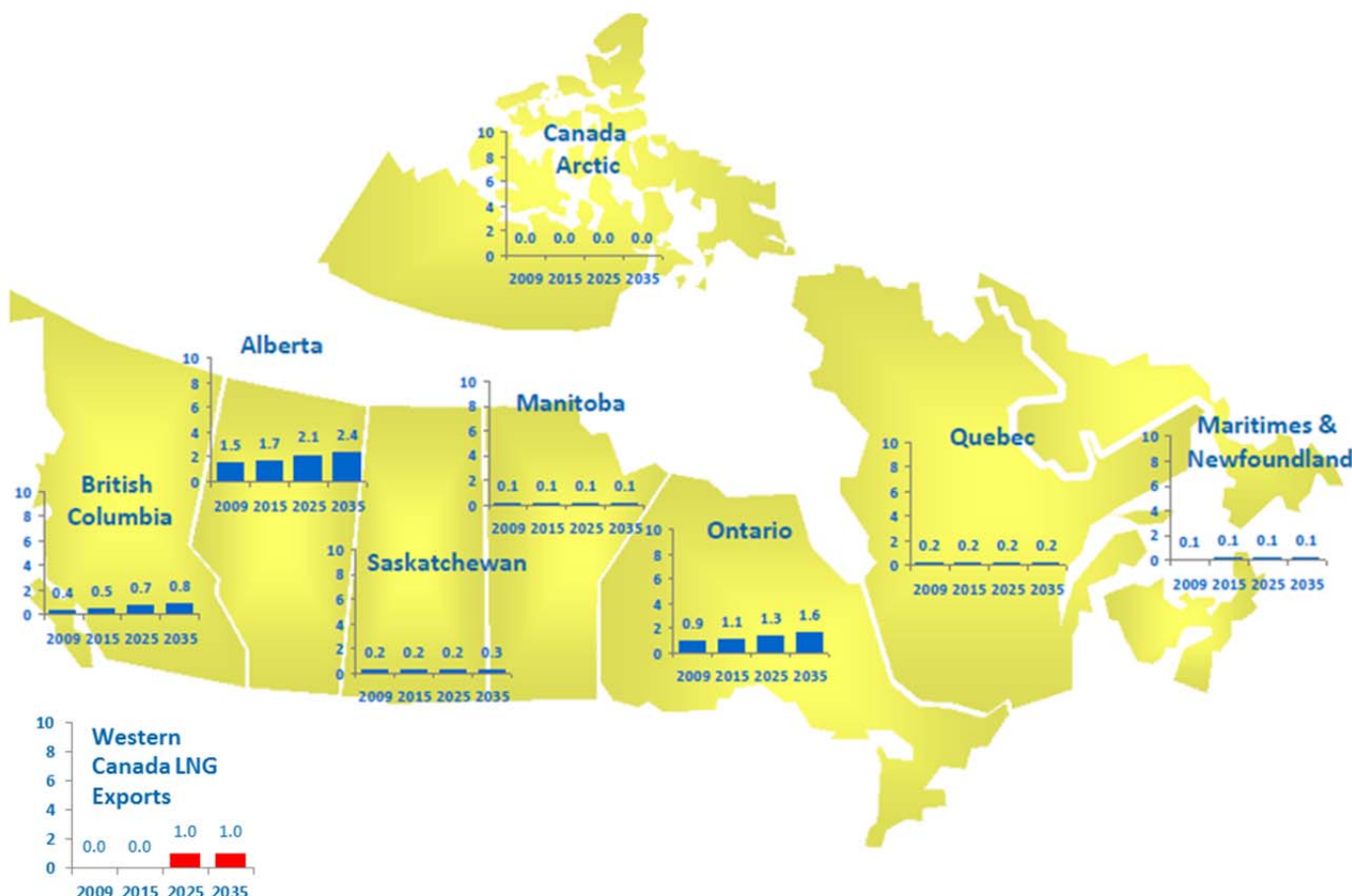


Source: ICF GMM® November 2014.

2.1.2 Regional Demand Growth in Canada

Natural gas demand in western Canada has a direct impact on Midwest markets due to its impact on natural gas availability from western Canada, as well as the impact of natural gas requirements in Ontario and Quebec on natural gas flows in and around the Midwest.

Exhibit 2-3: Regional Natural Gas Demand in Canada (Tcf)



Source: ICF GMM® November 2014.

2.1.3 Ontario and Quebec Demand

Demand in eastern Canada (Quebec and Atlantic Canada) is expected to remain relatively flat. There could be more gas demand from power generation and conversions of commercial and residential customers from oil to gas, but this is over a relatively small base. In addition, gas use in the power sector is limited by the large amounts of hydro available in Quebec. Ontario will see demand growth from the ongoing retirement of coal fired generation and some industrial growth. From a current base of about 1.1 Tcf (3.0 Bcfd), ICF forecasts the Ontario market could grow to 1.6 Tcf or 4.4 Bcfd by 2035.

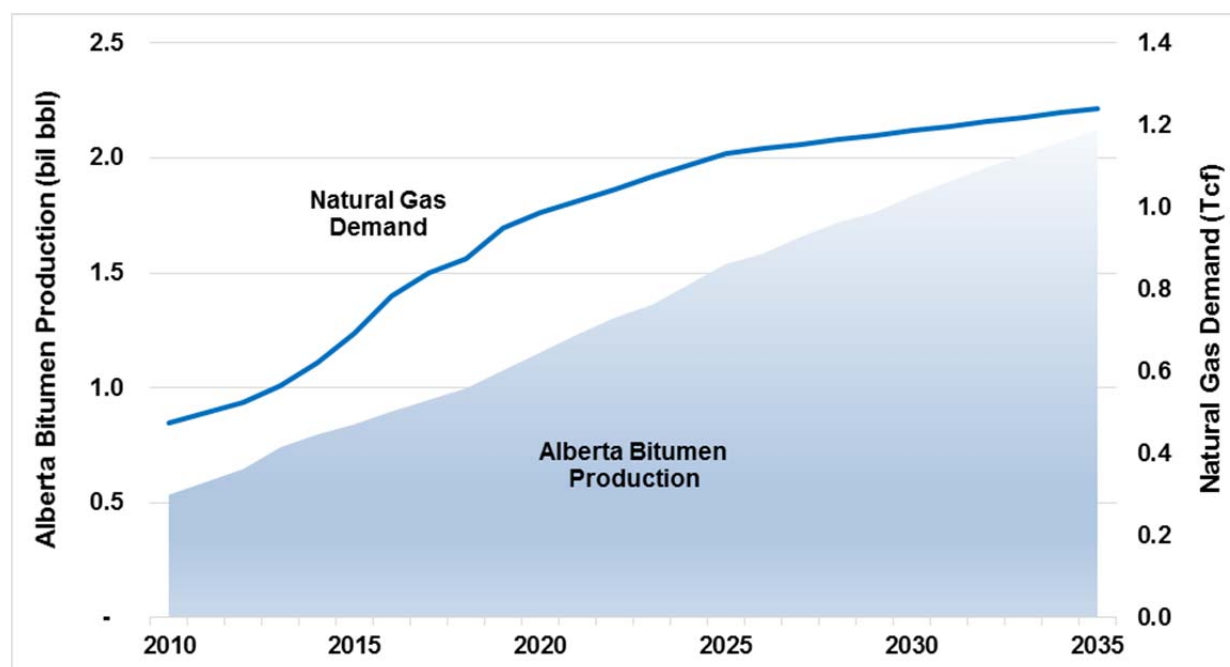
2.1.4 Western Canadian Demand

Natural gas demand in western Canada has a direct impact on Midwest markets due to its impact on natural gas supply available for export from the region. Western Canadian natural

gas consumption¹ (including LNG exports) is expected to grow from 2.1 Tcf in 2010 to nearly 3.6 Tcf by 2035, driven by growth in LNG exports and the industrial sector (oil sands development). With this growth, gas prices in the WCSB are expected to increase, making it more expensive in the distant eastern markets relative to supplies from other regions (e.g., Marcellus).

Most of the projected demand growth in western Canada is in oil sands demand. Development of Alberta's oil sands will mean significant consumption of natural gas fuels (see Exhibit 2-4). While significant development uncertainties persist, ICF expects oil sands production in Alberta to exceed 1.5 billion annual barrels by 2025 and 2.1 billion annual barrels by 2035, which would require over 1.1 Tcf in gas consumption in 2025 (the equivalent of 86 percent of Ontario's annual gas consumption that year), and 1.2 Tcf in natural gas consumption in 2035. This represents an increase of nearly 0.7 Tcf, or 1.8 Bcfd, of natural gas demand between 2013 and 2035. The growth in natural gas demand for oil sands production will significantly reduce natural gas available for export from the WCSB to Ontario and other markets.

Exhibit 2-4: Alberta Oil Sands and Related Natural Gas Consumption



Source: ICF GMM® November 2014.

There remains significant uncertainty with respect to future natural gas demand growth by the oil sands industry. Potential additional growth in oil sands demand that could result from higher than projected oil prices would further reduce natural gas available for export from the WCSB. Conversely, lower oil prices could reduce production and reduce gas demand. Moreover, oil sands development remains contentious and uncertain due to concerns about climate change

¹ Including gas consumption in British Columbia, Alberta, Saskatchewan, and Manitoba.

impacts, as well as the social and environmental impacts of moving oil sands production to markets outside of Alberta.

As mentioned above, there is significant uncertainty with regard to western Canadian sources of natural gas demand (i.e., LNG exports, Alberta bitumen production). However, lower than anticipated oil sands development and/or lower than anticipated LNG exports from British Columbia (BC) could free up natural gas for markets such as Ontario and long-haul shippers, meaning lower toll rates and higher TCPL Mainline throughputs. While this alternate scenario is not likely according to ICF's market forecasts, the scenario highlights the uncertainty surrounding actual natural gas demand requirements that could be met from these new sources. This suggests that buyers in Ontario and eastern Canada must consider the implications of oil sands development in western Canada when considering long-term sources of gas supply.

In today's market, there is also uncertainty regarding the amount of LNG export capacity that will ultimately be built in North America. Shifts in the pricing of LNG from pricing formulas, which are tied to crude oil prices to prevailing North American gas market prices that have occurred recently, may place pressure on LNG project economics. At the same time, the current price advantage in North America relative to world markets continues to make North American LNG project economics competitive internationally.

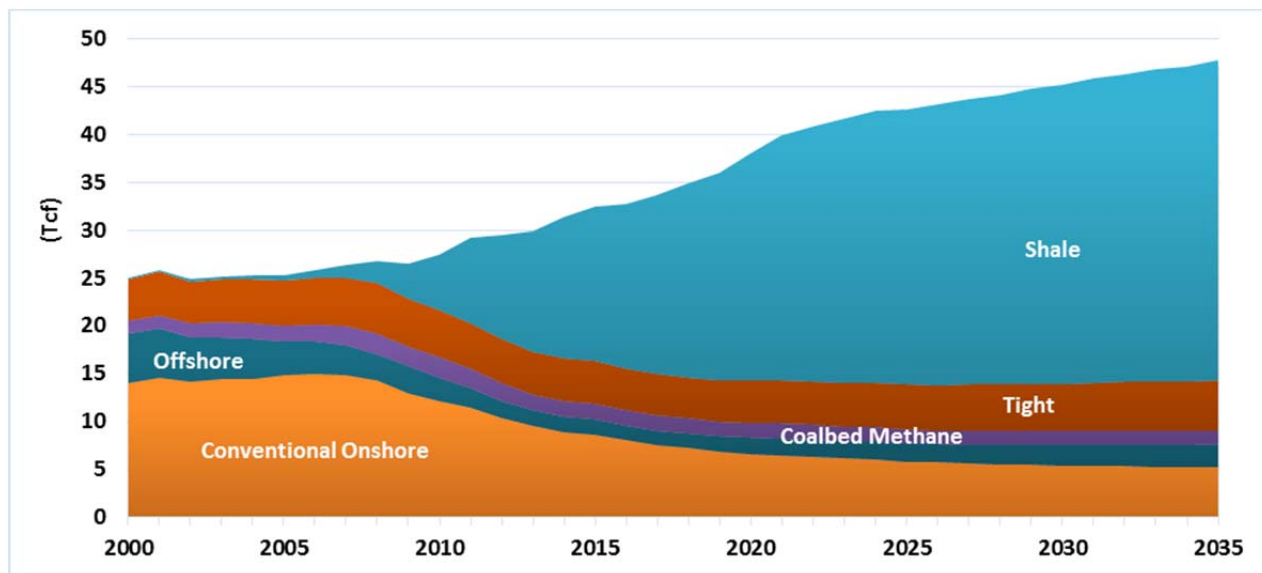
2.2 North American Natural Gas Supply Outlook

2.2.1 ICF Base Case Supply Outlook

Over the past five years, natural gas production in the U.S. and Canada has grown quickly, led by unconventional production, and is expected to grow in the future (see Exhibit 2-5). Unconventional production technologies (e.g., horizontal drilling, hydraulic fracturing) have fundamentally changed supply and demand dynamics for the U.S. and Canada, with unconventional production expected to offset declining conventional production in such areas as the WCSB. These geographic changes will call for significant infrastructure investments to create pathways between new supply sources and demand markets.

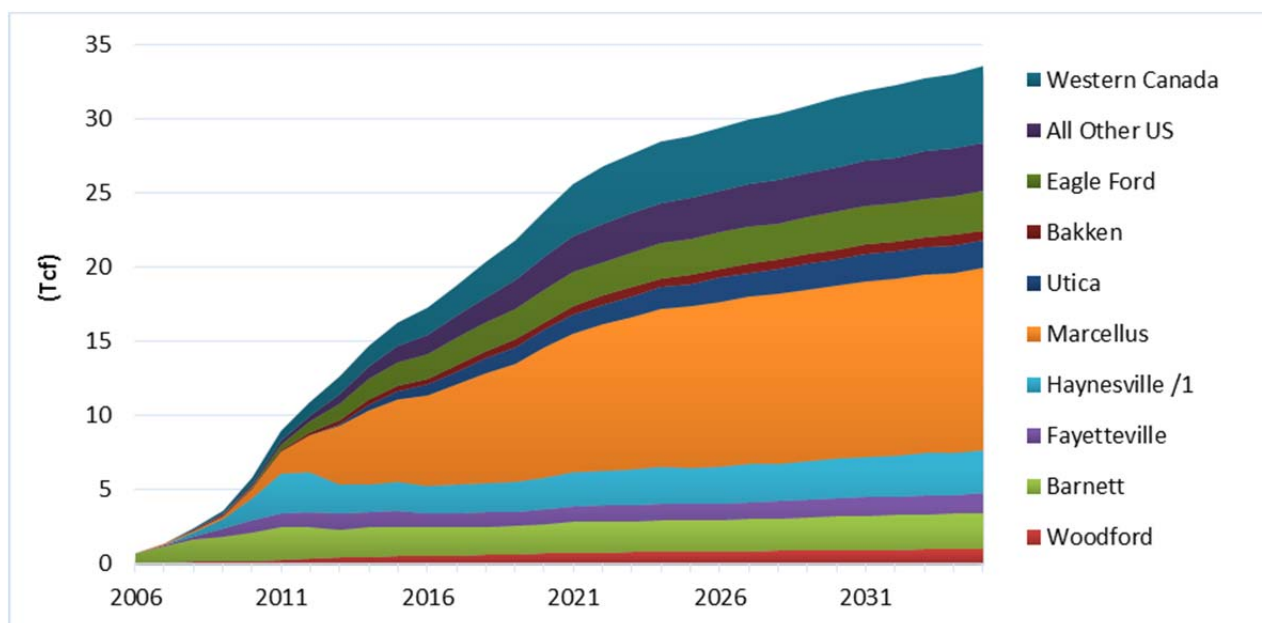
Production from U.S. shale formations will grow from 5.4 Tcf (15 Bcfd) in 2010 to nearly 28.3 Tcf (78 Bcfd) by 2035 (see Exhibit 2-6). As noted above, the major shale formations in North America are located in the U.S. Northeast (Marcellus and Utica), the Mid-continent (Barnett, Woodford, Fayetteville, and Haynesville), southern Texas (Eagle Ford), and western Canada (Montney and Horn River). The Bakken Shale, which spans parts of North Dakota and Montana, is primarily an oil formation but also has significant natural gas volumes. There are other shale formations in the U.S. that have not yet been evaluated or developed for gas production.

Exhibit 2-5: Historical and Projected U.S. and Canadian Gas Production



Source: ICF GMM® November 2014

Exhibit 2-6: Projected U.S. and Canadian Shale Gas Production



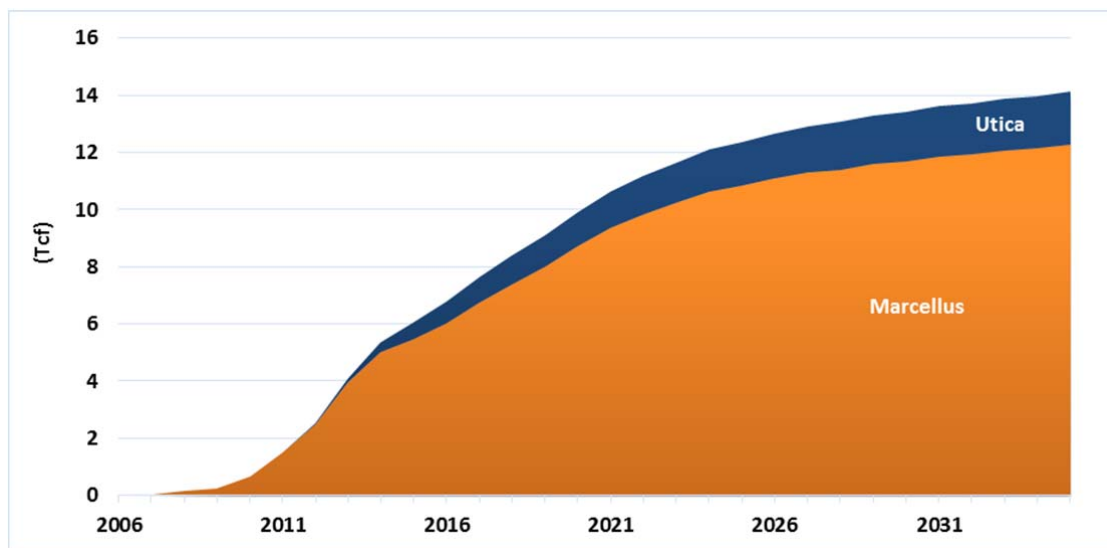
Source: ICF Detailed Production Report (DPR) November 2014.

Note: Haynesville production includes production from other shales in the vicinity (e.g., the Bossier Shale).

2.2.2 Marcellus and Utica Supply Outlook

The largest source of growth in North American natural gas supply is expected to come from production in the Marcellus and Utica basins. Five years ago, in 2009, the Marcellus and Utica plays had a minimal impact on natural gas markets, producing less than 250 Bcf (0.7 Bcf/d) of natural gas. As of 2014, shale gas production from these basins is expected to exceed 5.3 Tcf (14.6 Bcf/d) of natural gas. ICF is currently projecting production from the Marcellus and Utica basins to reach 9.9 Tcf (27.1 Bcf/d) by 2020 and 14.1 Tcf (38.7 Bcf/d) by 2035.

Exhibit 2-7: Projected Gas Production from the Marcellus and Utica Basins



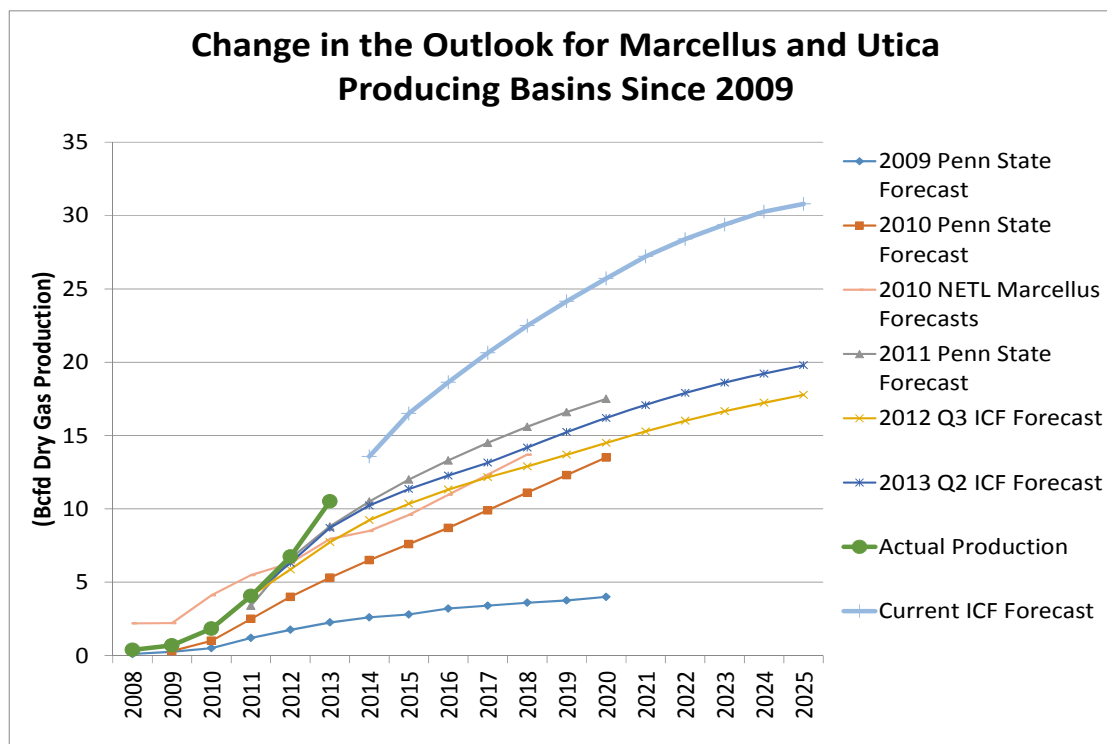
Source: ICF Detailed Production Report (DPR) November 2014.

The growth in production from these basins has been much more rapid than expected, and forecasters that have projected production from these basins, including ICF, have been increasing the long-term outlook for production from the region in almost each new forecast prepared. Exhibit 2-8 illustrates the change in forecasts for Marcellus/Utica production over time.

During the 2009-2011 time period, Pennsylvania State University published a series of forecasts for the Marcellus plays in Pennsylvania that were considered aggressive at the time. The university's forecast for 2020 increased from 1.4 Tcf (4.0 Bcf/d) in the 2009 study, to 4.9 Tcf (13.5 Bcf/d) in the 2010 study and 6.4 Tcf (17.5 Bcf/d) in the 2011 study. The trend of increasing projections has continued since 2011 in ICF's forecasts.

The change in outlook for Marcellus and Utica production has been driven by increases in the efficiency of exploration and development, and the productivity of the new wells, which have increased faster than expected.

Exhibit 2-8: Change in the Outlook for Marcellus and Utica Production



Source: Various compiled by ICF.

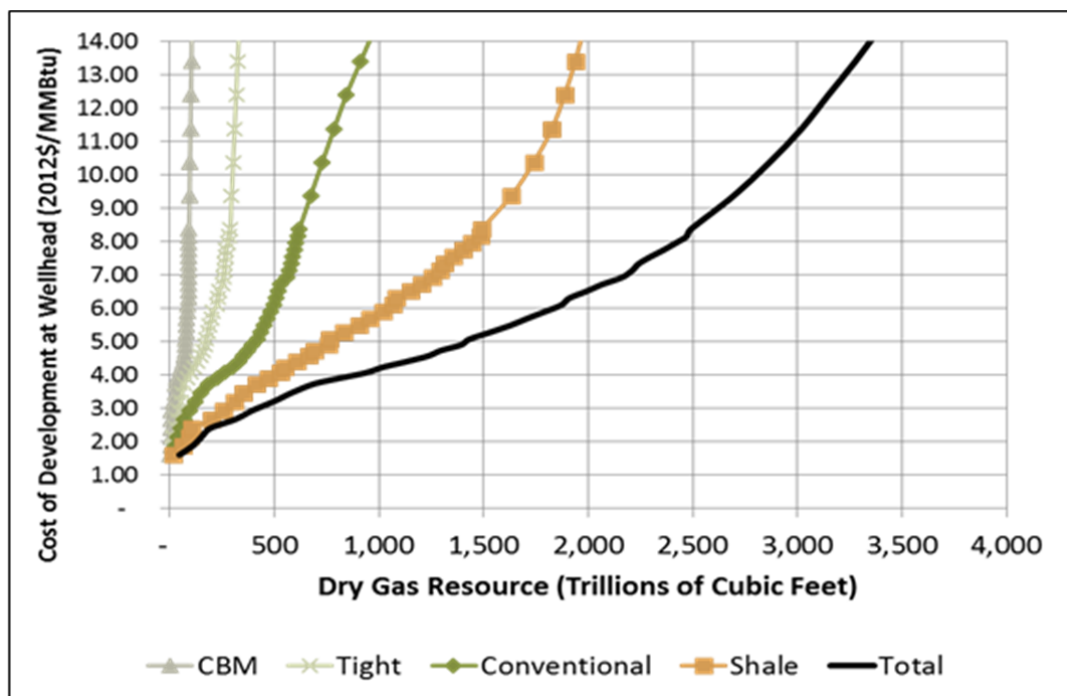
2.2.3 Natural Gas Production Costs

The development of new natural gas production technologies has led to a rapid decline in natural gas resource development costs. ICF has estimated that there are 1,500 Tcf of technically recoverable natural gas in the United States and Canada that can be developed at a wellhead cost of \$5 per MMBtu or less, of which about 800 Tcf is from shale gas resources. (See Exhibit 2-9, which shows the economically producible gas up to \$14/MMBtu at today's technology.)

ICF estimates that production of unconventional natural gas (including shale gas, tight gas, and coal bed methane, or CBM) will generally be much lower cost on a per-unit basis than conventional sources.² The natural gas supply curves show the incremental cost of developing various types of gas resources, as well as for the resource base in total. While there is considerable variation in costs across all of the shale production sites, generally shale plays such as the Marcellus are proving significantly cheaper (on a per-MMBtu basis) than conventional sources, including conventional sources in the WCSB. This lower cost of Marcellus gas, combined with the higher demand for gas in western Canada and transportation cost for delivering WCSB gas to eastern markets, contributes to the shift in sources of supply for northeastern gas markets in Canada and the United States.

² Unconventional refers to production that requires some form of stimulation within the well to produce gas. Conventional wells do not require stimulation.

Exhibit 2-9: Gas Supply Cost Curves



Source: ICF Detailed Production Report (DPR) November 2014.

2.2.4 LNG Exports

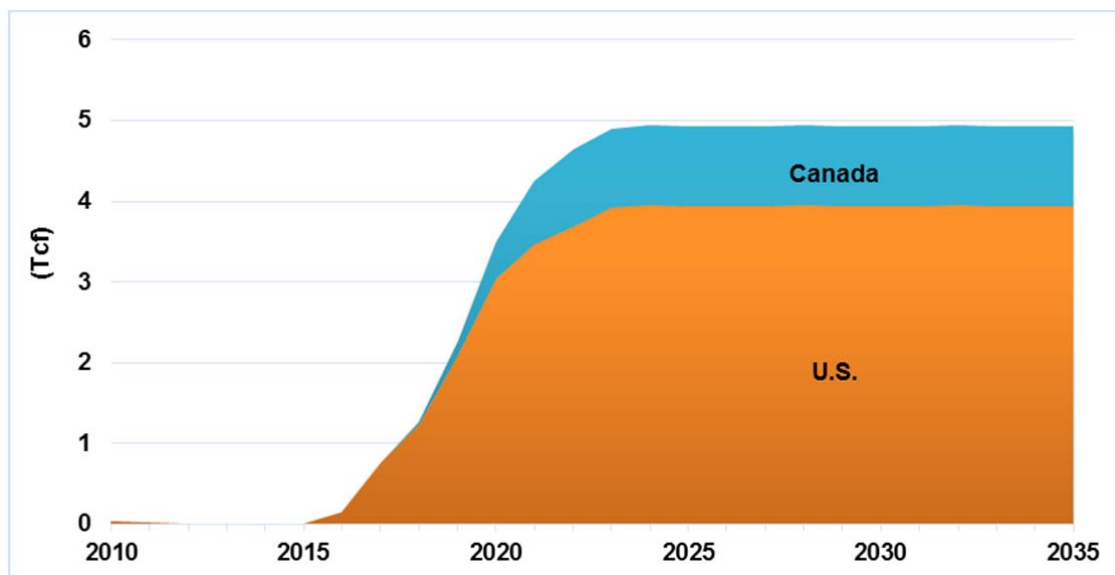
LNG exports are expected to provide additional markets for both Canadian and U.S. natural gas production. In Canada, the National Energy Board (NEB) has granted approval for 11 projects located on the West Coast. Twenty other LNG projects in British Columbia are in various stages of development, but have not yet received NEB approval.³ In the U.S., the U.S. Department of Energy has received 36 applications to export LNG to non-Free Trade Agreement (FTA) countries (totaling 13.9 Tcf, or 38 Bcfd, in LNG exports).⁴ Most of the major LNG-consuming countries, including Japan, do not have FTAs with the U.S. So far, nine facilities (including two Freeport LNG applications) have received approval for both FTA and non-FTA exports, for a total of 3.9 Tcf (10.6 Bcfd) to non-FTA countries. The majority of the approved facilities are located on the U.S. Gulf Coast.

The number of LNG facilities that may eventually enter the market remains highly uncertain. Based on our assessment of world LNG demand and other international sources of LNG supply, ICF is projecting completion of a total of 14 North American export facilities between 2016 and 2021 (three in Canada, eight on the U.S. Gulf Coast, two on the East Coast, and one on the West Coast), exporting a total of 4.9 Tcf (13.5 Bcfd) by 2023 (see Exhibit 2-10). The BC LNG facilities are dependent on the development of pipeline capacity to transport natural gas from Eastern British Columbia and western Alberta to the LNG facilities in BC. Development of the BC facilities will reduce the available supply of gas that otherwise could be exported from western Canada.

³ National Energy Board of Canada (NEB). "LNG Export License Applications." NEB, November 2014: Calgary, AB. Available at: <https://www.neb-one.gc.ca/pplctnflng/mjrpp/lnqxpirtlcnc/index-eng.html>

⁴ U.S. Department of Energy (DOE). "Long-term Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States." DOE, November 2014: Washington, D.C. Available at: <http://energy.gov/sites/prod/files/2014/11/f19/Long%20Term%20LNG%20Export%20Concise%20Summary%20Table%2011-14-14.pdf>

Exhibit 2-10: Projected North American LNG Exports (Tcf)



Source: ICF GMM® November 2014

The U.S. east coast LNG export projects included in ICF's Base Case are Cove Point in Maryland and Elba Island near Savannah, Georgia. Both projects have been in place since the early 1980s as import terminals.

- 1) Cove Point has received authorization to export from the U.S. DOE and has received its export facilities permit from the FERC for 0.82 Bcfd. The company has in place 20-year contracts with affiliates of Japan's Sumitomo Corp. and Gail India (GAIL) Ltd. With the major regulatory hurdles behind them, Cove Point is expected to begin exports in 2017-18.
- 2) Elba Island is expected to export up to 0.35 Bcfd of LNG equivalent beginning in 2017. Elba has received a DOE permit for export to countries with whom the United States has free trade agreements covering natural gas, but not to the rest of the world. Elba has filed with the FERC for the export facilities.

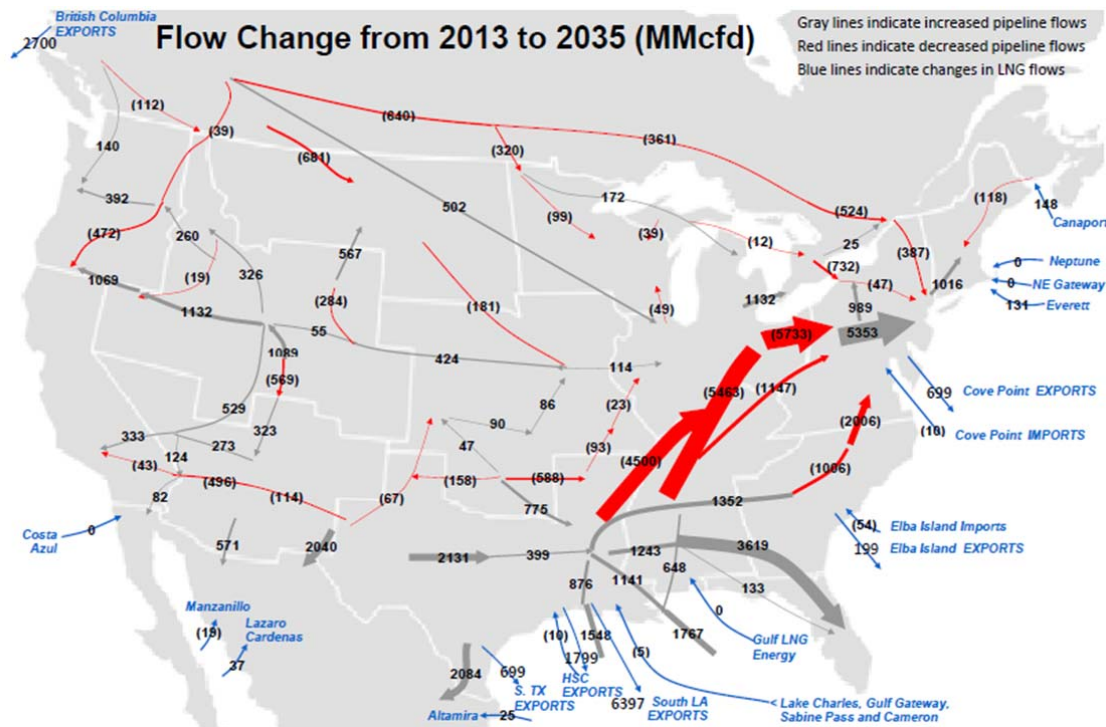
2.3 North American Pipeline Flows

As regional gas supply and demand continue to shift over time, there are likely to be significant changes in interregional pipeline flows. Exhibit 2-11 shows the projected changes in interregional pipeline flows from 2013 to 2035 in the ICF Base Case. The map shows the United States divided into regions and Canada as a single region. The arrows show the changes in gas flows over the traditional gas pipeline corridors between the regions between the years 2013 and 2035, where the gray arrows indicate increases in flows and red arrows indicate decreases. The blue lines indicate changes in LNG flows.

Exhibit 2-11 illustrates how gas supply developments, particularly in the Marcellus and Utica, will drive major changes in North American gas. The growth in Marcellus Shale gas production in the Mid-Atlantic Region will displace gas that once was imported into that region, hence the large red arrows from the south into the north and northeastern states. In

effect, the Middle Atlantic Region becomes a major producer of gas and supplies gas to consumers throughout the East Coast.

Exhibit 2-11: Projected Change in Interregional Pipeline Flows (2013-2035)



Source: ICF GMM® November 2014

The large increases in flows eastward from the West South Central Region (Texas, Louisiana, and Arkansas) are due to growing shale gas production in the region. However, most of this gas is consumed in the East South Central Region (Mississippi, Alabama, Tennessee, and Kentucky) and South Atlantic Region (Florida to North Carolina) where demand is growing. In addition, natural gas will be exported from the West South Central in the form of LNG starting in 2016. The growing Marcellus gas production in the Middle Atlantic Region will also displace gas flow from the West South Central Census Region to the South Atlantic states.

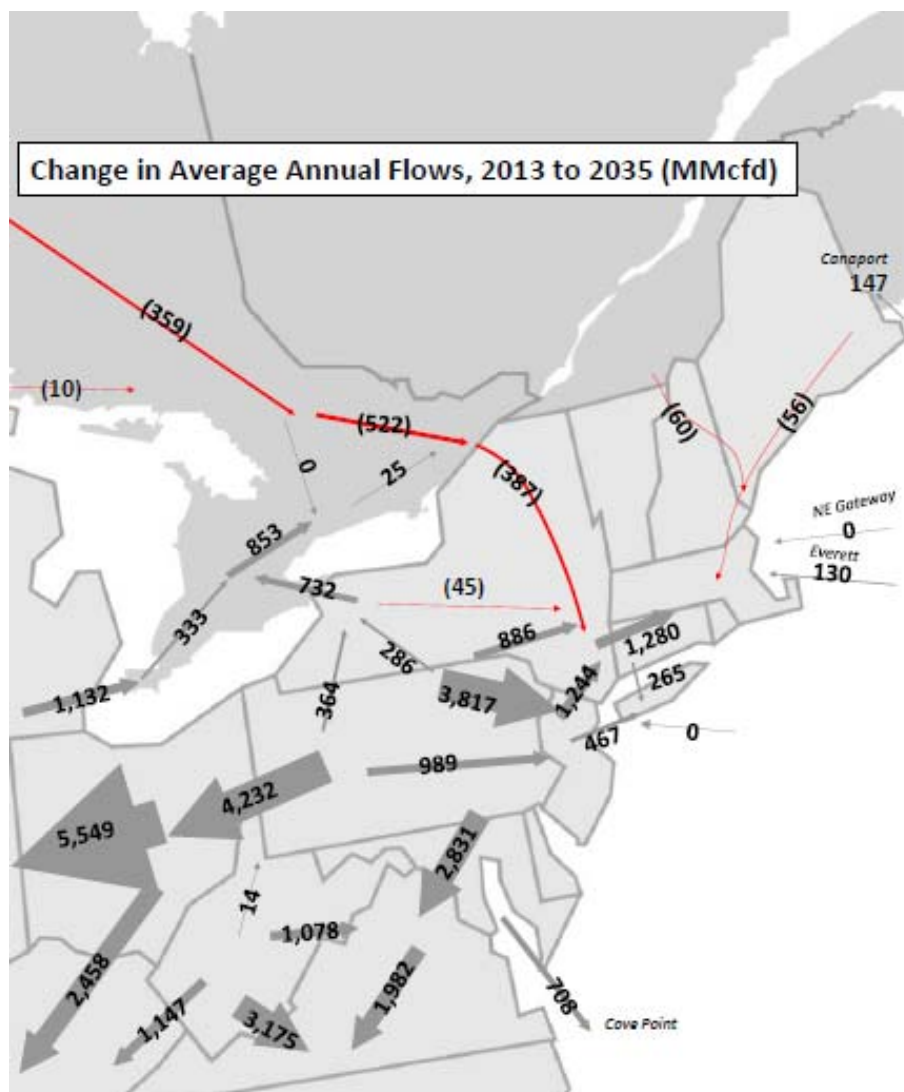
Gas flows out of western Canada are projected to continue to decrease in response to expanding Marcellus and Utica production, capturing more of the traditional eastern markets for WCSB gas, declining production of conventional gas in the WCSB, and increased demand in Alberta. Growth in production from shale gas resources in British Columbia and Alberta will be more than offset by declines in conventional gas production in Alberta until 2020, as well as growth in natural gas demand in western Canada. Strong industrial demand growth in western Canada for producing oil from oil sands will keep more gas in the western provinces. The planned LNG export terminals in British Columbia also will draw off gas supply once exports of LNG begin.

Pipeline flows west out of the Rocky Mountains will increase to northern California. The completion of the Ruby Pipeline in 2011 allowed Rocky Mountain gas to displace gas coming from Alberta on Gas Transmission Northwest.

Changes in LNG imports into the Gulf Coast, as well as into Cove Point, Elba Island, and New England will also change gas flow patterns. ICF projects that a total of 14 North American LNG export facilities are expected to be built during the period of 2016 and 2021. Three of these facilities will be in Canada (Kitimat and BC LNG), eight facilities will be along the Gulf Coast, two along the East Coast, and one on the West Coast. By 2020, U.S. and Canadian LNG exports will total 3.5 Tcf (9.6 Bcf/d), and are expected to reach 4.9 Tcf (13.5 Bcf/d) by 2025.

Exhibit 2-12 focuses on the changes in the flow patterns in closer proximity to the Northeast and Marcellus. Historically, considerable volumes of gas flowed from Ontario into the Northeast through three pipeline paths; through Niagara into New York, onto the Iroquois pipeline and via Portland Natural Gas Transmission System (PNGTS). In the past several years, these flows have decreased dramatically. This trend will continue to the point where considerable volumes of gas will flow into Ontario from the Northeast, principally through Niagara. These supplies will augment the growing volume of gas entering Ontario from the South West through Michigan.

Exhibit 2-12: Change in Gas Flows in the Northeast 2013-2035 (MMcfd)



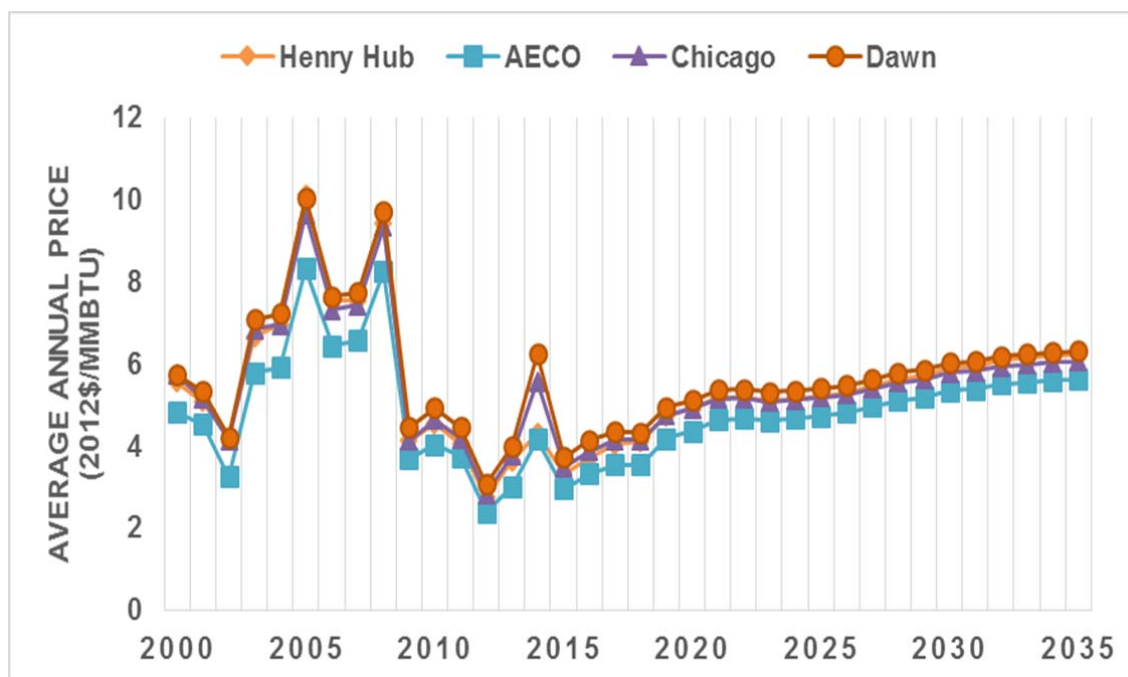
Source: ICF GMM© November 2014

2.4 Natural Gas Price Outlook

The 2013-2014 extreme winter weather conditions leading to natural gas supply access issues, particularly in the U.S. Northeast, led to historic highs in natural gas prices, exceeding \$100 per MMBtu on a small number of days.⁵ Such an extreme supply access case highlights the need for additional pipeline capacity. Eastern Canada has experienced such supply access issues for a number of years, which can be solved with additional pipeline access in and around Ontario.

With growing gas demand and increased reliance on new sources of supply, the ICF Base Case forecasts higher gas prices from current levels. Nevertheless, the cost of producing shale gas moderates the price increase. Gas prices throughout North America are expected to remain moderate; however, in some regions other market dynamics will influence regional prices. As more gas is produced in the U.S. Northeast from shale resources, the market price in this region is expected to decline relative to both Henry Hub and to Western Canada. The decline in Northeastern U.S. prices will be reflected in Michigan prices as well. In terms of impact on Michigan, Marcellus shale is cheaper than importing from Alberta, and is expected to become cheaper than gas from the Gulf Coast and Midcontinent given the changes in market prices in different regions and the transportation costs associated with moving natural gas from the production region into Michigan. The region's ability to improve access to Marcellus product will limit price fluctuations.

Exhibit 2-13: GMM Average Annual Prices for Selected Markets



Source: ICF GMM® November 2014.

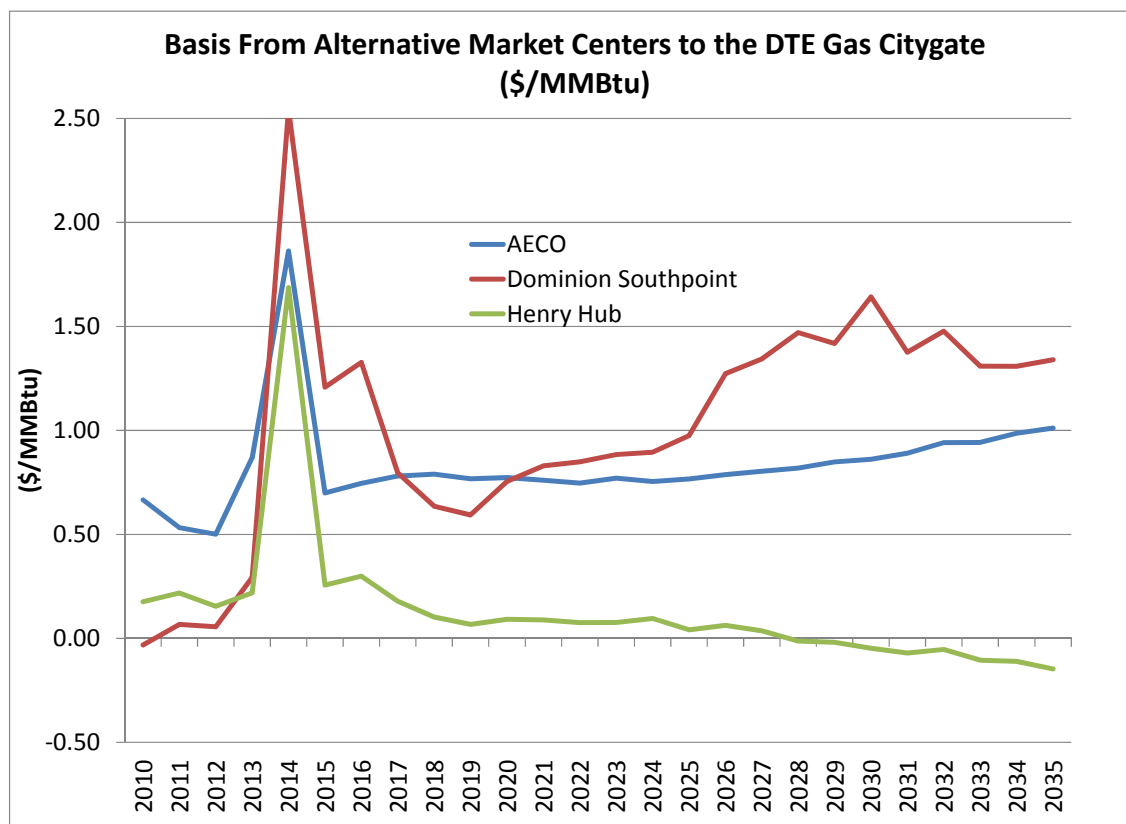
⁵ Federal Energy Regulatory Commission (FERC). "Impacts on the Bulk Power System," Item No: A-4 (6), 16 January 2014. Available at: <http://www.ferc.gov/legal/staff-reports/2014/01-16-14-bulk-power.pdf>

2.5 Impact of Gas Market Changes on Natural Gas Prices and Basis

The changes taking place across North American in natural gas supply and demand will have a fundamental impact on the price relationships between the available sources of natural gas for DTE and its customers. Exhibit 2-14 illustrates this impact.

- The rapid growth in Marcellus/Utica supply is turning the Northeastern U.S. into a major supply center, pushing down prices at major Northeast hubs, including Dominion Southpoint. (Dominion Southpoint is a liquid hub closest to the Nexus receipt points and used here as a proxy for the region.) Thus, shown in Exhibit 2-14, the basis between Dominion Southpoint and the DTE Citygate will continue to grow.
- The growth in LNG and Mexican exports from the Gulf Coast states is changing the Gulf Coast into a net demand region. Prices at Henry Hub are expected to increase relative to prices in the Appalachian Basin, and at the DTE Gas citygate leading to a declining basis spread and eventually lower prices at DTE than at Henry Hub. This will attract gas from Marcellus and Utica to flow southward.
- In the WCSB, the decline in conventional natural gas production, combined with growth in natural gas demand for oil sands production and LNG exports is expected to lead to increasing prices relative to Northeastern markets.

Exhibit 2-14: Impact of Natural Gas Market Changes on Natural Gas Pipeline Basis to DTE Citygate from Alternative Supply Basins



Source: ICF GMM® November 2014.

The change in price relationship increases the attractiveness of natural gas supply purchased from the Northeastern U.S. Supply centers for consumers throughout the Northeastern United States, the Midwest and Central Canada relative to the supply basins that these regions have historically relied upon.

3 Detailed Marcellus and Utica Production and Pipeline Outlook

The proposals to develop new pipeline capacity such as NEXUS from the Marcellus and Utica plays in the Appalachian Basin into the U.S. Midwest markets are a relatively new development. Throughout the early 2000's, natural gas pipeline capacity was developed to transport natural gas from the Rocky Mountains, WCSB, and Mid-continent producing regions into Eastern and Midwestern markets. The Rockies Express Pipeline (REX) from the Rocky Mountains to eastern Ohio was completed in 2010. Expansion of the Vector Pipeline from Chicago into the Detroit and Ontario markets was considered as recently as 2013. Today, in contrast, the pipeline expansion projects under consideration generally flow in the opposite direction to these older projects. The turnabout has been caused by three major changes in North American natural gas markets discussed earlier.

- 1) Production from the Marcellus and Utica plays has increased much faster than anticipated, and today is expected to reach much higher levels than expected as recently as two years ago. The growth in production from these regions has a significant impact on our projections of natural gas flows throughout the Northeastern and Midwestern United States and Central Canada.
- 2) ICF is projecting significantly more LNG exports from the U.S. Gulf Coast, which impacts the price and availability of alternative sources of natural gas supply available to the U.S. Midwest.
- 3) Projected flows from western Canada into Ontario and U.S. Midwest markets have declined substantially due to expected growth in demand for WCSB gas to meet local demand and to provide supplies for LNG exports from British Columbia and the U.S. West Coast.

Of these developments, the most important has been the acceleration of gas production in the Marcellus and Utica shale plays in the Appalachian Basin. Growth in production from these basins is largely responsible for the increase in the LNG export outlook and has displaced gas supplies from the WCSB in Ontario, Quebec, and U.S. Northeast markets.

This section of the report provides a detailed assessment of the supply of gas that would be available to shippers on NEXUS. Because the predominant factor driving market change in North American natural gas markets is the production in the Appalachian Basin, this report focuses first on the broader region, before focusing specifically on the region around the NEXUS receipt point.

3.1 Marcellus and Utica Production Outlook

Since 2007, the Marcellus and Utica in the Appalachian Basin have become the most dominant natural gas plays in North America. Gas production from the area has grown from very low levels in early 2007 to an average of 5.5 Tcf (15.1 Bcfd) this year, roughly 20 percent of the total gas production in the U.S. ICF projects growth in production from these plays to continue to grow at a rate of 2.1 Bcfd per year over the next few years, equating to an annual growth rate of 9.0%.

ICF used a geographic information systems (GIS) modeling approach to assess the resource potential of the Marcellus, Utica, and other gas and liquids plays⁶ in the U.S. Northeast. The ICF resource assessment is based upon geology and reservoir engineering principles. GIS map data layers include depth/structure, thickness, organic content, thermal maturity, and pressure gradient. Gas-in-place is a function of these factors, as well as porosity and water saturation. Much of the data used for the plays of interest were derived as part of a nationwide shale gas assessment using actual industry map and survey data for parameters. In addition, ICF evaluated well level production data to estimate the volume of reserves related to each well. The trends in this information relate to resource development economics.

Shale plays such as the Marcellus often contain a range of hydrocarbon resources from oil to wet gas and dry gas. This range is related to thermal maturity, which is mapped in GIS. The model assesses gas- and liquids-in-place for hundreds of six-by-six-square-mile grid cells. The model also uses input assumptions about well productivity and production profiles to estimate recoverable resources (recovery of gas- and oil-in-place). Recovery per well is crosschecked against actual historical horizontal well recovery to “ground-truth” the model.

3.1.1 Resource Estimate

Exhibit 3-1 summarizes the technically recoverable resource base for the plays in this region modeled by ICF. The basic unit on the table is the ICF “subplay,” which represents a map division of the play that is deemed significant, or a region showing variability within the play. (Note: In Exhibit 3-1, the categories for Utica and Huron are sample areas of the play and are labeled as A, B, C, etc. These are not true subplays but show some of the variability within the plays.) The most important plays for current and future activity are the Marcellus and the Ohio Utica. A portion of the Utica in New York State has been modeled, but drilling has not been allowed to date. ICF has also modeled the Huron shale play, which is a shallower productivity Devonian shale play above the Marcellus that extends to the southwest of the Marcellus. These plays in total represent over 1,000 Tcf of shale gas recoverable resources, which is about one-half of the ICF Lower-48 total. The Marcellus is dominant in the region, with about 700 Tcf of recoverable gas. The ICF subplay division for the Marcellus is shown in Exhibit 3-2. The Ohio Utica has 266 Tcf.

⁶ A play is a group of [oil and gas fields](#) or prospects in the same region that are controlled by the same set of geological circumstances. Robert Stoneley (1995). "North Sea petroleum plays". *Introduction to Petroleum Exploration for Non-geologists*. Oxford University Press. P. 106.

Exhibit 3-1: Technically Recoverable Resources by Play from ICF Model

Subplay	MMB	Bcf	MMB Recoverable	NGL Ratio
	Recoverable Crude	Recoverable Dry Gas	Natural Gas Liquids	Bbls/MMcf
1. Marcellus PA NE Core - Very Dry	0	191,456	3,506	18
2. Marcellus NE PA-NY Other Dry	67	76,198	2,224	29
3. Marcellus PA NW Dry	368	58,642	3,948	67
4. Marcellus Fold Belt Very Dry	0	111,857	2,279	20
5. Marcellus SW Rich Wet	340	9,759	1,179	121
6. Marcellus SW Lean Wet (N)	226	19,803	1,906	96
7. Marcellus SW Lean Wet (S)	262	14,689	1,465	100
8. Marcellus PA SW Dry	0	63,052	1,386	22
9. Marcellus WV Dry	22	152,683	5,291	35
Total	1,286	698,140	23,184	33
1. OHPAWV Utica-dry gas	0	218,769	4,770	22
2. OHPAWV Utica-oil	8,097	20,455	2,646	129
3. OHPAWV Utica-wet gas	415	26,368	2,272	86
Total	8,513	265,593	9,688	36
NY Utica-A	0	1,911	33	17
NY Utica-B	0	6,204	108	17
NY Utica-C	0	9,088	158	17
NY Utica-Other	4	39,220	946	24
Total	0	17,203	299	17
Quebec Utica1	0	8,996	27	3
Lower Huron-A	93	4,888	865	177
Lower Huron-B	36	10,023	1,033	103
Lower Huron-C	2	94	15	165
Lower Huron-Other	112	20,164	1,915	95
Total	112	20,164	1,915	95
Total of above	9,911	1,010,096	35,112	185

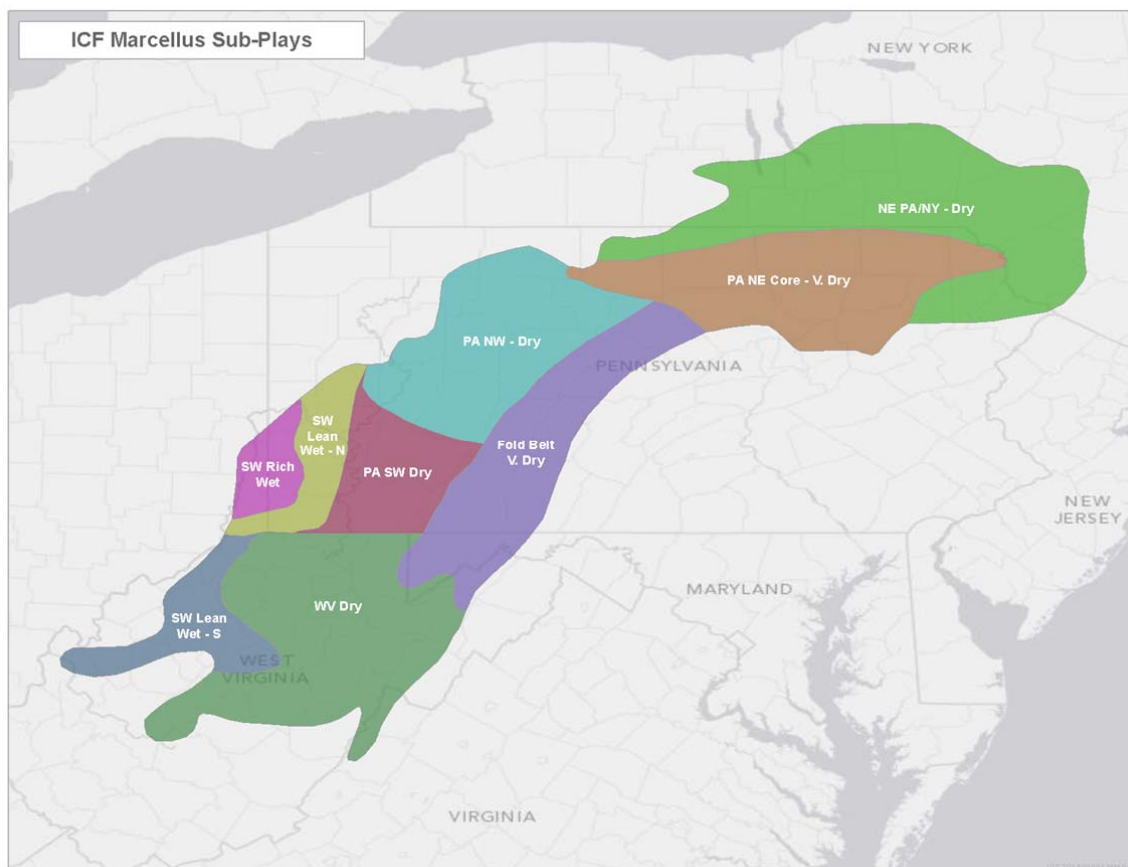
Source: ICF

Marcellus and Utica plays have substantial amounts of natural gas liquids (NGLs) as opposed to crude oil. NGLs total 23 billion barrels in the Marcellus and 10 billion barrels in the Utica. The last column in Exhibit 3-1 shows the ratio of total NGLs to dry gas in terms of barrels per million cubic feet, the “liquids ratio.” Several of the subplays containing the greatest volume of gas have the lowest liquids ratios, meaning the gas is drier.

A high percentage of the Utica gas resource base is considered dry, where 219 Tcf out of 266 Tcf of recovery is in the dry gas zone. The wet gas window, which is a relatively narrow

NE-SW trending map area, includes 26 Tcf of recovery and 2.6 billion barrels of NGLs. As most of the wells to date have been drilled in the wet gas window, less is known about well productivity in the other windows. Thus, well productivity in the dry gas window is somewhat of an uncertainty factor for the Utica.

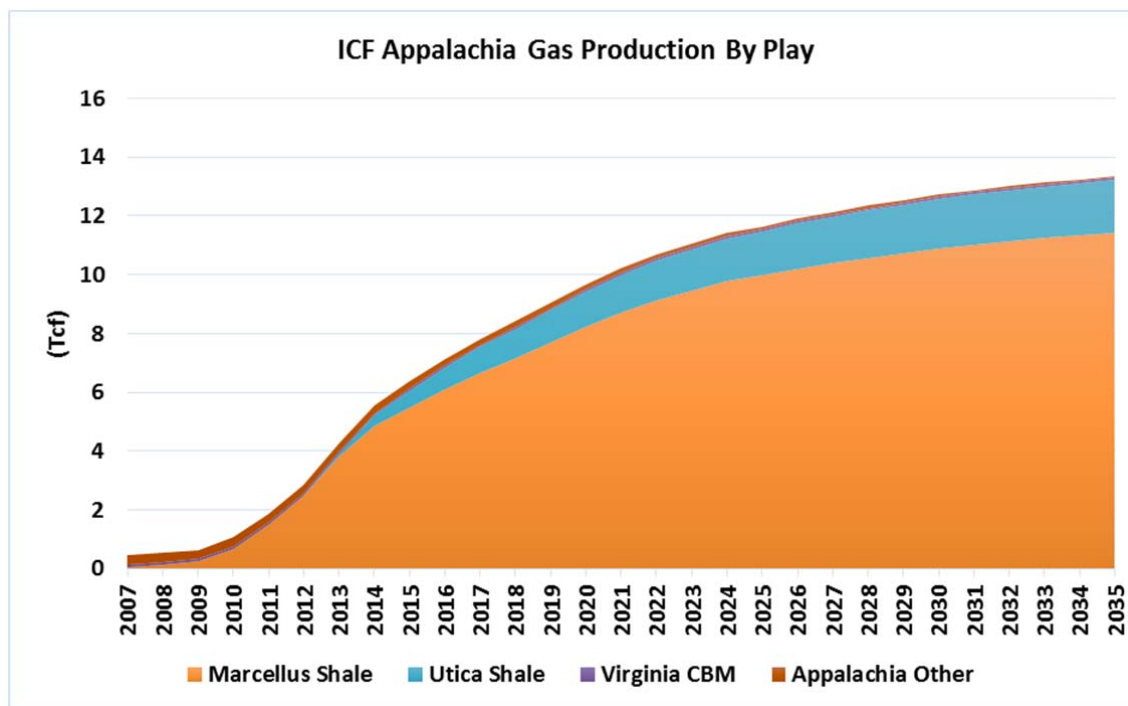
Exhibit 3-2: ICF Subregions in the Marcellus



3.1.2 Production Activity and Outlook for the Marcellus and Utica

As shown in Exhibit 3-3, the Marcellus play dominates our Appalachian Basin gas production forecast through 2035, with production growing from the current 4.9 Tcf (13.3 Bcfd) to 11.4 Tcf (31 Bcfd). Total cumulative Marcellus production during this period is over 200 Tcf, or about one-third of recoverable resources. Utica production in the forecast is expected to increase from about 0.3 Tcf (0.9 Bcfd) currently to 11.4 Tcf (4.9 Bcfd). ICF estimates that approximately 200 Tcf of gas in the Marcellus is producible at prices at and below \$5.00 per MMBtu, with another 20 Tcf producible from the Utica play at those prices.

Exhibit 3-3: Outlook for Natural Gas Production in the Appalachian Basin by Play



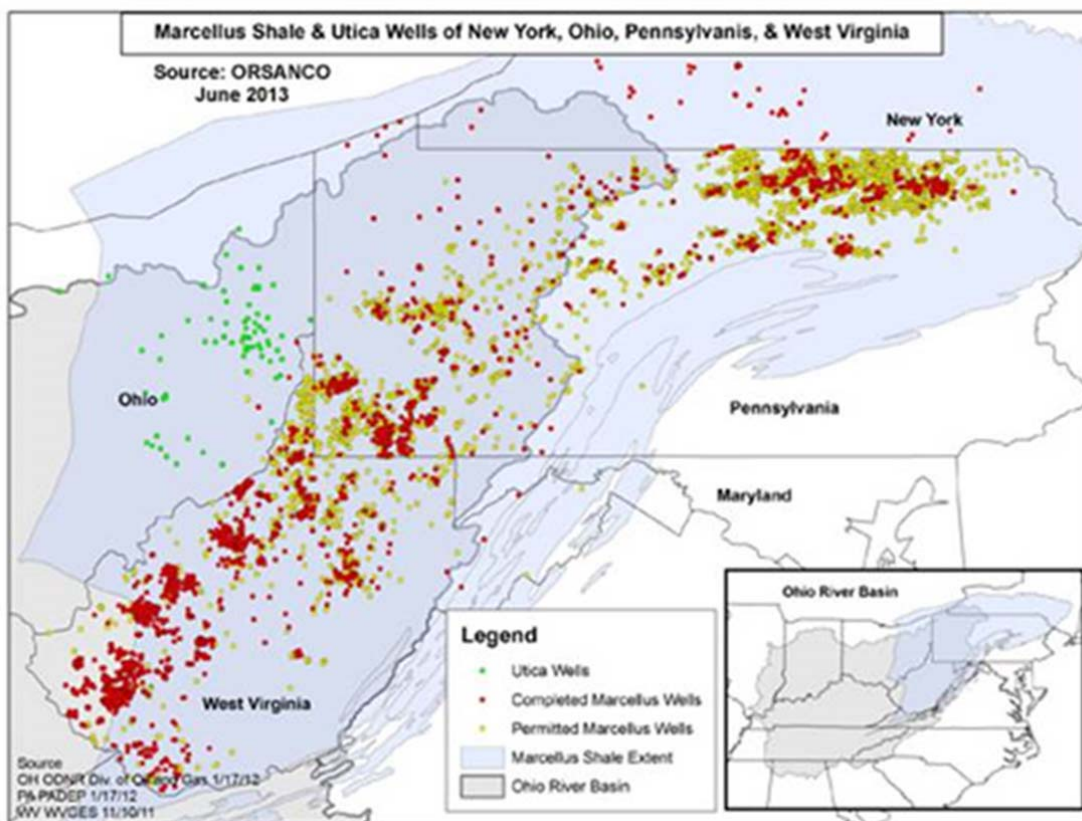
Source: ICF GMM® November 2014.

3.2 Marcellus and Utica Exploration and Production Activity

The Marcellus play has been by far the most active shale gas play to date. However, drilling activity has declined due in recent years to market conditions. Currently, about 66 rigs are active in the play.⁷ Exhibit 3-4 shows the areas of permitting and drilling activity in the Marcellus as of June 2013. One cluster of activity is in northeastern Pennsylvania in the dry gas area, and the other cluster is in southwest Pennsylvania in the wet gas area, with activity extending into West Virginia. The areas shown in the western part of West Virginia are shallow development areas that are not part of the horizontal drilling play.

⁷ "Biweekly Report: A RigData Publication", August 29, 2014. The sum of Pennsylvania Marcellus (62 rigs), and Other Appalachian (4 rigs). The Biweekly Report reports 72 total rigs operating in the Appalachian Basin.

Exhibit 3-4: Wells Drilled in the Appalachian Marcellus and Utica (2013)



Source: Map reproduced from http://www.marcellus-shale.us/gas-shale_plays.htm.

3.3 Pipeline Infrastructure

A major determinant of the production outlook for the Marcellus and Utica is the availability of gas pipeline infrastructure to export gas out of the region. Some areas have been slow to develop because of the lack of transport capacity. In the last three years a large number of pipelines have been proposed to expand out of the Marcellus. A list of these proposals is presented in Exhibit 3-5

Exhibit 3-5: Proposed Pipeline Expansion Projects in the Marcellus/Utica Basin

Natural Gas Pipeline Projects	Company	Product	Origin	Destination	Capacity (MMcf/d)	In-Service Date /1	Status
Rose Lake Expansion Project	Tennessee Gas Pipeline	Natural Gas	Line 300	Station 313	230	Nov-14	Under Construction
Mercer Expansion Project	National Fuel	Natural Gas	Western PA	Western PA	105	Nov-14	Under Construction
TEAM 2014	Texas Eastern	Natural Gas	OH, WV, PA	OH, WV, PA	600	Nov-14	Under Construction
Northeast Connector/Rockaway Lateral	Williams Transco	Natural Gas	Station 195 Transco (PA)	Rockaway Long Island	100/647	Nov-14	Under Construction
Tygart Valley Pipeline	Crestwood Midstream/Mountaineer	Natural Gas	Randolph Co. WV	Colubia Gas Trans.	200	Nov-14	Under Construction
Seneca Lateral	Rockies Express Pipeline	Natural Gas	MarkWest Seneca Plant	REX E. OH	250	Nov-14	Under Construction
West Side Exp - Smithfield III	Columbia Gas Transmission	Natural Gas	Waynesburg, PA	Smithfield, WV	444	Nov-14	Under Construction
Natrium-to-Market	Dominion Transmission	Natural Gas	WV Gas Plant	Greene County, PA	185	Late 2014?	FERC Approved
Wright Interconnect Expansion	Iroquois Gas Transmission	Natural Gas	Wright, NY	Wright, NY	650	Mar-15	Filed with FERC
Southeast Mainline System Reversal	ANR Pipeline	Natural Gas	IN	Eunice, LA	600	Mar-15	Announced
Constitution	Williams/Cabot/Piedmont	Natural Gas	Susquehanna, PA	Schoharie, NY	650	May-15	Filed with FERC
East to West Project	Rockies Express	Natural Gas	Clarington, Oh	Southern Illinois	1,800	Jun-15	Announced
Virginia Southside Expansion	Williams Transcontinental	Natural Gas	VA	VA	270	Sep-15	Under Construction
Central Tioga County or (TCE2)	Empire Pipeline	Natural Gas	Tioga PA	TGP	260	Sep-15	Announced
Ohio Pipeline Energy Network (OPEN)	Texas Eastern	Natural Gas	OH	Midwest and GC	550	Nov-15	FERC Approved
Leidy Southeast	Williams Transcontinental	Natural Gas	Leidy, PA	AL	525	Nov-15	Filed with FERC
Northern Access 2015	National Fuel	Natural Gas	Cattaraugus County, PA	TGP	140	Nov-15	Filed with FERC
West Side Expansion	National Fuel	Natural Gas	Western PA	Western PA	95	Nov-15	Filed with FERC
Uniontown to City Gas	Texas Eastern	Natural Gas	PA, OH, IN	PA, OH, IN	425	Nov-15	Announced
Broad Run Flexibility Project	Tennessee Gas Pipeline	Natural Gas	Broad Run Lateral, WV	Broad Run Lateral, WV	590	Nov-15	Announced
Quick Link	Columbia Gas Transmission	Natural Gas	East OH	East OH	500	Nov-15	Announced
East Side Exp	Columbia Gas Transmission	Natural Gas	Millenium in NY	NJ	310	Dec-15	Under Construction
Inergy Midstream, UGI, and WGL	Commonwealth Pipeline	Natural Gas	Lycoming County, PA	Charles County, MD	1,200	Dec-15	Potential Expansion
Keystone Connector	Williams/Dominion	Natural Gas	REX Clarington, OH	Transco St195, SE PA	1,000	2015?	Potential Expansion
West to East Phase 1 & 2	National Fuel	Natural Gas	Overbeck, PA	Leidy, PA	425	2015?	Filed with FERC
Lebanon Lateral Reversal	ANR Pipeline	Natural Gas	IN	IN	350	2015?	Announced
Ohio-Louisiana Access Project	Texas Gas Transmission	Natural Gas	Lebanon, OH	Louisiana	600	Jun-16	Announced
Clarington Project	Dominion Transmission	Natural Gas	WV	WV	250	Oct-16	Filed with FERC
AIM Project	Algonquin	Natural Gas	Eastern NY	MA	342	Nov-16	Filed with FERC
NEXUS Gas Transmission	Spectra	Natural Gas	NE Ohio	MI and Ontario	1,000	Nov-16	Announced
Leach Express	Columbia Gas Transmission	Natural Gas	WV	Leach, KY	1,500	Nov-16	Announced
Rayne Express	Columbia Gulf Transmission	Natural Gas	Leach, KY	Rayne, LA	1,500	Nov-16	Announced
Continent to Coast (C2C) Project	Portland Natural Gas Transmission	Natural Gas	Canada Border	ME	~130	Nov-16	Announced
South To North (SoNo)	Iroquois Gas Transmission	Natural Gas	Brookfield, CT	Waddington, NY	300	Dec-16	Announced
TGP 200 Line Looping	Tennessee Gas Pipeline	Natural Gas	Wright, NY	Mendon, MA	1,000	2016-17	Announced
Northern Supply Access	Texas Gas Transmission	Natural Gas	PA, OH	Texas	584	Apr-17	Open Season
ET Rover Pipeline	Energy Transfer	Natural Gas	PA, OH	OH, MI	3,250	Jun-17	Open Season
ANR East	ANR Pipeline	Natural Gas	Clarington OH	Southern Illinois	1,000	Jul-17	Announced
Atlantic Sunrise	Williams Transcontinental	Natural Gas	PA	GA	1,700	Jul-17	Announced
Broad Run Expansion Project	Tennessee Gas Pipeline	Natural Gas	Broad Run Lateral, WV	Broad Run Lateral, WV	200	Nov-17	Announced
Gulf Markets - North to South	Texas Eastern	Natural Gas	East OH	Kosi, MS	415	Nov-17	Announced
Atlantic Bridge	Algonquin & M&N	Natural Gas	NJ	Maritimes, CN	1,000	Nov-17	Announced
Northeast Energy Direct (NED)	Tennessee Gas Pipeline	Natural Gas	Wright, NY	Dracut, MA	1,200	2017-18	Announced

Source: ICF International, compiled from various public announcements.

These projects can be divided into four broad categories.

- Projects internal to the producing region to interconnect pipelines, processing plants, and gathering systems.
- Projects that expand existing pipelines or new pipelines to northeastern markets along from New Jersey to New York and New England. These projects will also tie into pipes interconnecting with Canadian pipes at Niagara, Waddington, and other eastern receipt points.
- Projects that will support reversing the traditional long-haul pipeline flows or adding new pipelines to serve southeastern and Gulf Coast markets.

- Projects that will expand pipeline infrastructure towards Chicago and the Midwest, including reaching Dawn in Canada. NEXUS is in this group.

As these facilities are constructed and Marcellus gas gains better access to the broader gas market, gas prices in the Marcellus would be expected to increase, relative to Henry Hub. Basis spreads between the Marcellus and other markets will better reflect the cost of pipeline transportation than the effects of constraints in takeaway capacity as is now the case.

The Marcellus and Utica plays in the Appalachian Basin are huge and economic. ICF estimates approximately 963 Bcf of recoverable gas is located in Pennsylvania and Ohio, using present day technology at prices under \$15 per MMBtu and that 220 Bcf could be produced at \$5 per MMBtu or less. ICF forecasts substantial production increases from these plays for the next 20 years. The driving feature behind the NEXUS pipeline, as well as other pipelines being proposed from this region, is the superabundance of supply seeking markets.

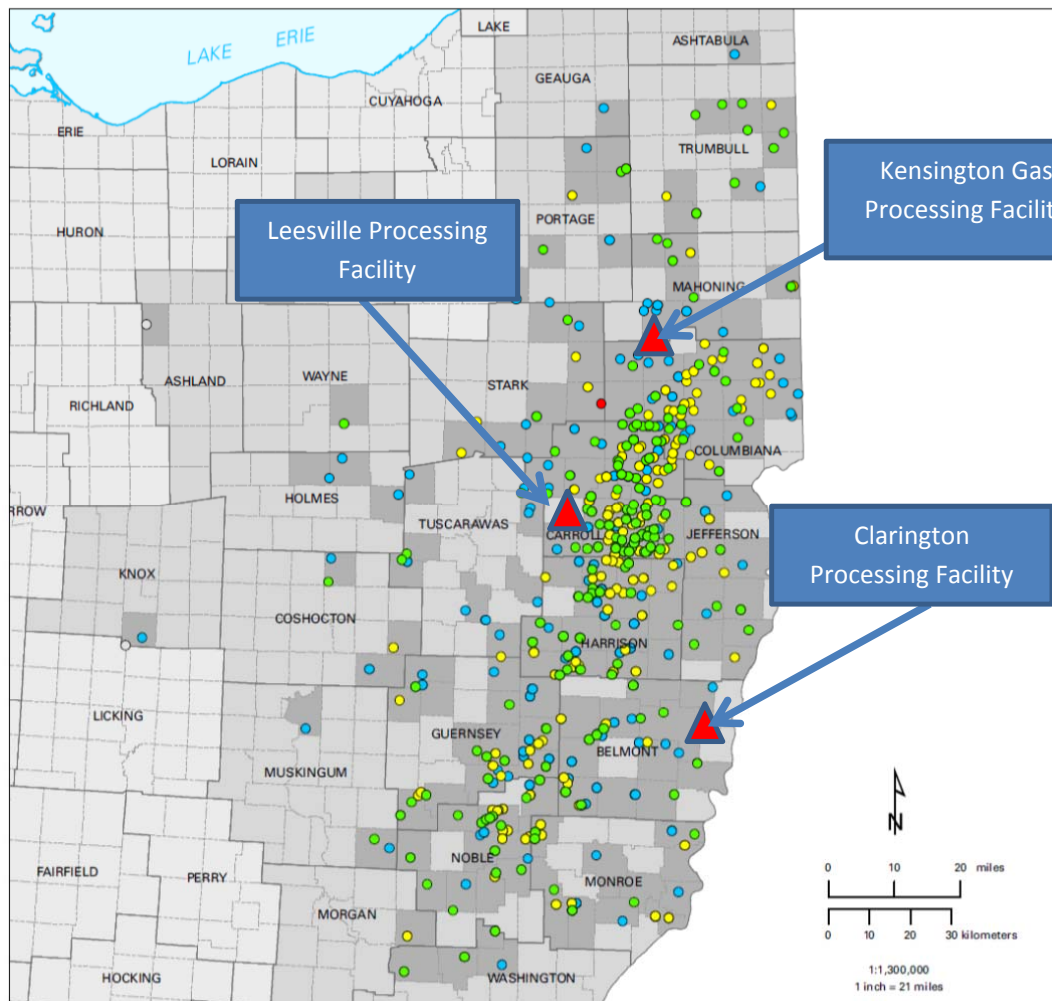
3.4 Availability of Natural Gas Supply at the NEXUS Receipt Point

The NEXUS Pipeline receipt point at Kensington is located in a prolific producing region in the Utica shale play. Exhibit 3-6 shows the rig activity for the Ohio Utica, in the area proximate to the NEXUS pipeline. Producing Utica wells are shown in green, while permits are shown in blue. Drilled but not yet producing wells are shown in yellow. As of April, 2014, there were 389 producing Ohio Utica wells with an average first quarter overall play production rate of 740 MMcfd and 43,000 b/d. The average rate per well during the quarter was 1.9 MMcfd and 110 bbls of condensate.

Data published by the Ohio Department of Natural Resources show that in the first quarter of 2014 production was up to 740 MMcfd was compared to 475 MMcfd in the fourth quarter of 2013.⁸ While significant production growth began in 2012, the lack of sufficient processing and pipeline capacity in the region has slowed growth. New pipelines and processing capacity will help to resolve this constraint.

⁸ Ohio Department of Natural Resources. <http://oilandgas.ohiodnr.gov/production>. Accessed Nov 6, 2014.

Exhibit 3-6: Ohio Drilling Activity as of April, 2014



EXPLANATION

Horizontal well status as of 4/5/2014

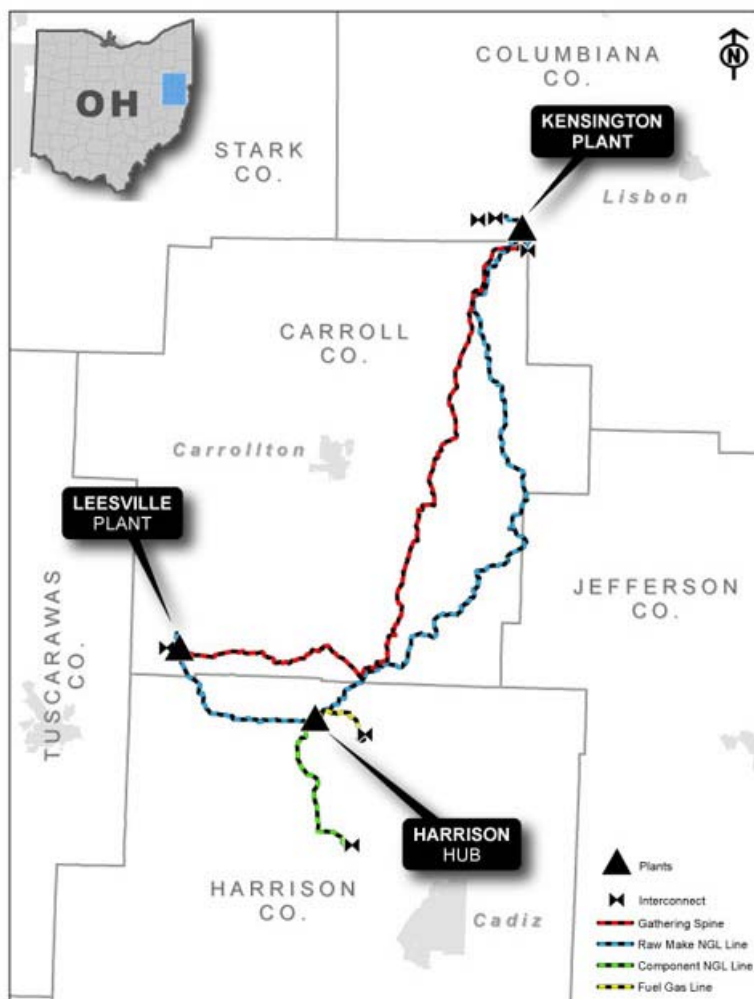
- PERMITTED - Permitted, Not Drilled, or Canceled (392)
- DRILLED - Drilled or Drilling (405)
- PRODUCING - Producing or Plugged Back (389)
- INACTIVE - Drilled Inactive or Shut in (1)
- PLUGGED - Final Restoration or Lost Hole (12)
- Dry and Abandoned (3)

Source: Ohio Department of Natural Resources

3.4.1 Processing and Pipeline Capacity Around the Nexus Receipt Point

The Kensington gas plant is currently designed to process 800 Mmcfd of wet gas produced in this region. The plant is part of the Utica East Ohio Midstream Buckeye (Buckeye) project shown in Exhibit 3-7. The Buckeye project (owned by Access Midstream, M3 Midstream and EV Energy Partners), includes a major gas gathering system ranging from the Kensington facility in the Northeast down to the Harrison Hub in Harrison County, Ohio and the Leesville Plant in Carroll County, Ohio.

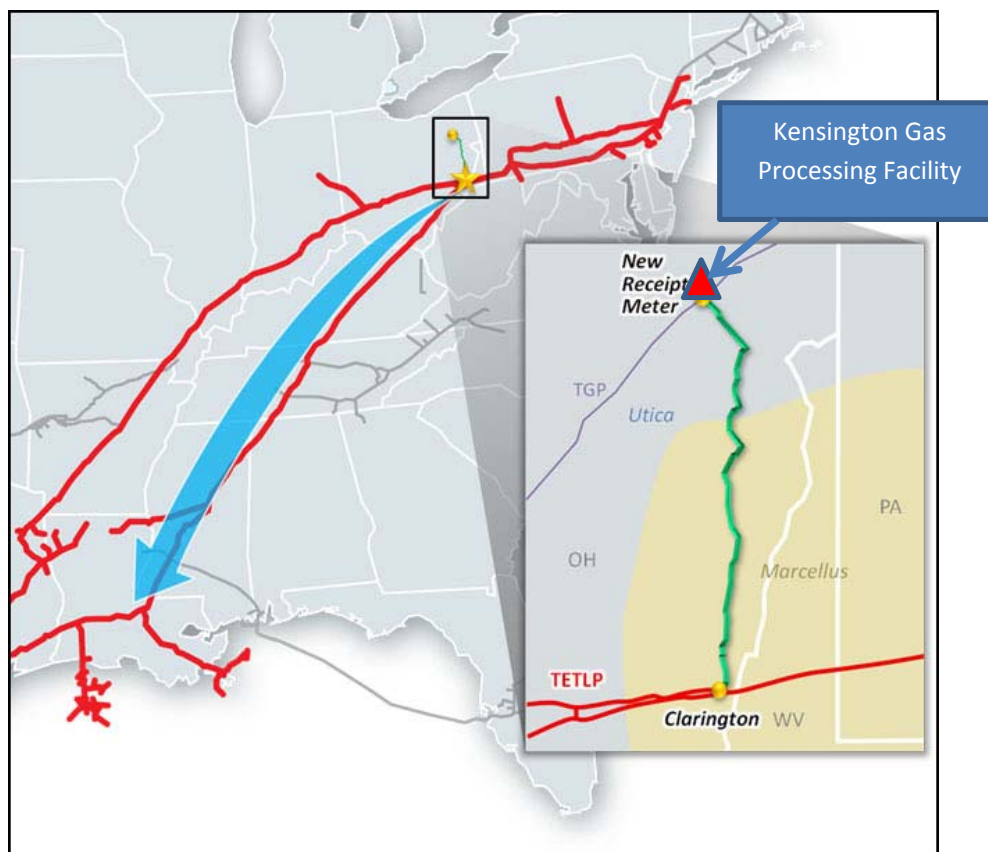
Exhibit 3-7: Buckeye Project Gathering and Processing Assets



Source: M3 Midstream

There are currently a number of announced projects in the region to increase gathering and processing capacity, and to interconnect the existing pipelines in the region. The Spectra Ohio Pipeline Energy Network (OPEN) project (Exhibit 3-8) will add 550,000 Dth per day of pipeline capacity along a 75 mile corridor through the Utica production region from the Tennessee Gas Pipeline near the Kensington plant to the Texas Eastern system in Western Pennsylvania by the end of 2015. Blue Racer, which is a partnership between Dominion and Caiman Energy is also building out an extensive gathering and processing facility in the region (Exhibit 3-9). Additional gathering, processing and pipeline interconnect projects are expected to be announced as production and demand increase.

Exhibit 3-8: Spectra “OPEN” Pipeline Project



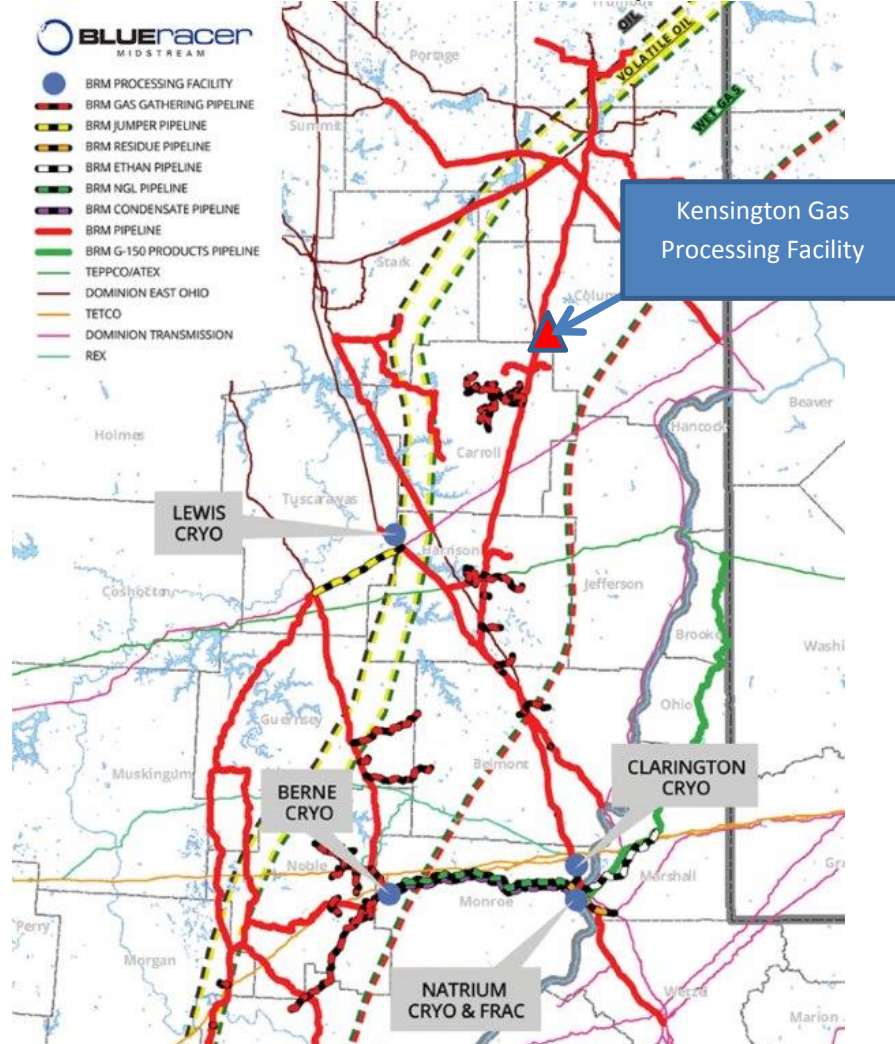
Source: Spectra Energy

This region is also well connected with the Marcellus producing regions in Southwest Pennsylvania and Eastern Ohio. NEXUS will include receipt point interconnects with several major pipelines traversing the region, including the Texas Eastern and Tennessee Gas Pipelines. The capacity of the Texas Eastern system in this area is about 2875 MMcf/d, while the capacity of the Tennessee Gas Pipeline in this area is about 1025 MMcf/d⁹. The interconnects with Texas Eastern and Tennessee Gas Pipelines increase market liquidity and provide additional security of supply for NEXUS receipts.

The ultimate amount of natural gas produced and processed in this area of the Utica will depend on the amount of pipeline take-away capacity from the region. That is to say, the gas reserves in the region are abundant but underdeveloped. Once sufficient pipeline capacity is constructed to provide access to markets, production from the region will increase. The natural gas gathering and processing facilities needed to fill the pipeline capacity will be developed in conjunction with the pipeline take-away capacity.

⁹ Source: Lippman Consulting Services Pipeline Database.

Exhibit 3-9: Blue Racer Asset Map



Source: Blue Racer

3.4.2 Natural Gas Pricing at the NEXUS Receipt Point

The NEXUS pipeline will establish a new natural gas pricing dynamic around the pipeline receipt point(s) once the pipeline is in place. In addition, the pipeline will provide market access for a rapidly growing region of the Appalachian Basin, including significant production from the Utica shales. As a result, currently there is no direct market proxy for pricing NEXUS pipeline receipts. ICF used the projected Dominion Southpoint price as the closest and most direct liquid market center to the NEXUS receipt point. Dominion Southpoint is the largest and most liquid market center in the region, and includes segments of the Dominion system in near proximity to the Kensington gas plant.

Platt's determines the Dominion South Point index price based on reported transactions within the region defined as:

"Deliveries into two Dominion Transmission main lines: One runs northeast from Warren County, Ohio, midway between Cincinnati and Dayton, and merges with the second line just northeast of Pittsburgh, PA. The second line runs from Buchanan County, VA., on the Virginia/West Virginia border north to the end of the zone at Valley Gate in Armstrong County, PA. Major stations in the South Point system

include interconnections with ANR Pipeline (Lebanon station), Columbia Gas Transmission (Windbridge and Loudoun stations), Tennessee Gas Pipeline (Cornwell station), Transcontinental Gas Pipe Line (Nokesville station) and Texas Eastern Transmission (Lebanon, Oakford, Chambersburg, Perulack and Windridge stations). Storage pools in the South Point system include South Bend, Murrys ville, Oakford, Gamble, Hayden, Webster, Colvin, North Summit, Bridgeport, Lost Creek, Kennedy, Fink and Rocket Newberne.”¹⁰

While natural gas production in the immediate region of the NEXUS receipt point is expected to continue to increase, we expect this region of Ohio and the Utica shales to maintain a price premium relative to Dominion Southpoint. The price premium is estimated to be about \$0.12 to \$0.14 per Dth, representing \$0.10 per Dth in transportation, plus 0.5% fuel and other variable costs associated with delivering gas into the NEXUS pipeline.

¹⁰ Platt’s “Methodology and Specifications Guide – North American Natural Gas”, November 2014, page 10.

4 Comparison of Alternative Pipeline Projects from the Appalachian Basin into Michigan, Ontario and the Midwest

Three companies have proposed major pipeline projects to transport natural gas from Eastern Ohio to the Midwest, including Michigan and Ontario. The alternative projects include the NEXUS project, proposed by Spectra Energy, the ETP Rover Project, and the ANR East project. This section of the report reviews each of the pipeline options, and provides a comparison of the different pipeline options from the perspective of DTE Gas.

4.1 Review of Alternative Pipeline Options

4.1.1 Nexus Pipeline

Spectra Energy Corporation, Enbridge Inc., and DTE Energy are jointly developing the proposed NEXUS Gas Transmission (NEXUS) project, which is designed to transport between 1.5 and 2.0 Bcf/d of Marcellus and Utica natural gas from Eastern Ohio to markets in Ohio, Michigan, Chicago, and Dawn. The project will consist of a newly-constructed Greenfield Pipeline that will extend approximately 250 miles from receipt points in eastern Ohio to interconnect with the existing pipeline grid in southeastern Michigan. As proposed, the path will utilize both existing and expansion capacity on the DTE Gas transportation system and the Vector Pipeline (Vector) System to access Chicago and the Dawn Hub.

The NEXUS project was the first of the three projects to be proposed, but has yet to pre-file the project with the FERC. NEXUS recently completed a supplemental open season (from July 23 to Aug 21, 2014). In its third quarter earnings report for 2014, Spectra reported that:

The NEXUS pipeline, which will bring supply diversity to the U.S. Midwest and Eastern Canada by delivering Utica and Marcellus gas, has signed precedent agreements with Chesapeake, CNX Gas and Noble in addition to the previously announced agreements with Midwest and Eastern Canadian LDCs.¹¹

The project is scheduled for completion by November 2017. The route for the Nexus pipeline is shown in Exhibit 4-1.

¹¹ Spectra Energy, "Spectra Energy Reports Third Quarter 2014 Results", November 6, 2014.
<http://investors.spectraenergy.com/phoenix.zhtml?c=204494&p=irol-newsArticle&ID=1985879>

Exhibit 4-1: Nexus Gas Transmission System



Source: NEXUS Gas Transmission

4.1.2 Rover Pipeline

The Rover Pipeline, proposed by Energy Transfer Partners (ETP), would result in up to 3.25 Bcfd of incremental pipeline capacity from Eastern Ohio to Western Ohio, 1.3 Bcfd of incremental capacity into Michigan, and 1.0 Bcfd of incremental capacity from Michigan into Ontario.

On October 30, 2014, ETP announced that it had:

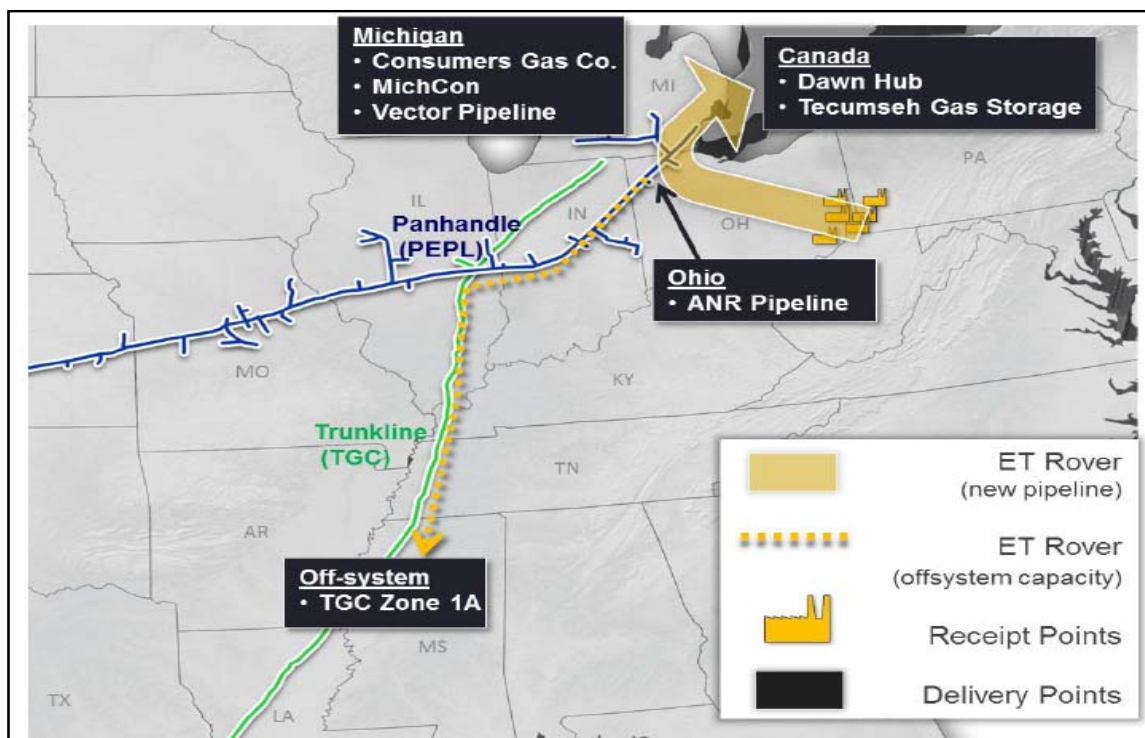
“secured additional long-term binding shipper agreements on its Rover natural gas pipeline project to connect Marcellus and Utica shale supplies to markets in the Midwest, Great Lakes and Gulf Coast regions of the United States and Canada. As a result of the additional agreements, the pipeline is fully subscribed through 15 and 20 year fee-based contracts to transport 3.25 billion cubic feet per day (Bcf/d) of capacity.

The approximately 800-mile natural gas pipeline, estimated to cost \$3.8 to \$4.4 billion, will deliver natural gas from processing plants and interconnections in Northwest West Virginia, Western Pennsylvania and Eastern Ohio to the Midwest Hub near Defiance, Ohio as well as to multiple delivery points in Michigan and to the Union Gas Hub near Sarnia, Ontario. Rover also will interconnect with ETP’s Panhandle Eastern Pipe Line (PEPL), allowing shippers to deliver gas to Gulf Coast markets through ETP’s Trunkline system. Transportation from the supply regions to the Midwest Hub near Defiance is expected to begin by December 2016 to serve the

Gulf Coast and Midwest markets. The remaining service to other markets including Michigan will be in service by mid-2017. ¹²

Rover has pre-filed for approval with the FERC, and the project could come on line by Q2 2017. The pipeline route for Rover is shown in Exhibit 4-2.

Exhibit 4-2: Rover Pipeline

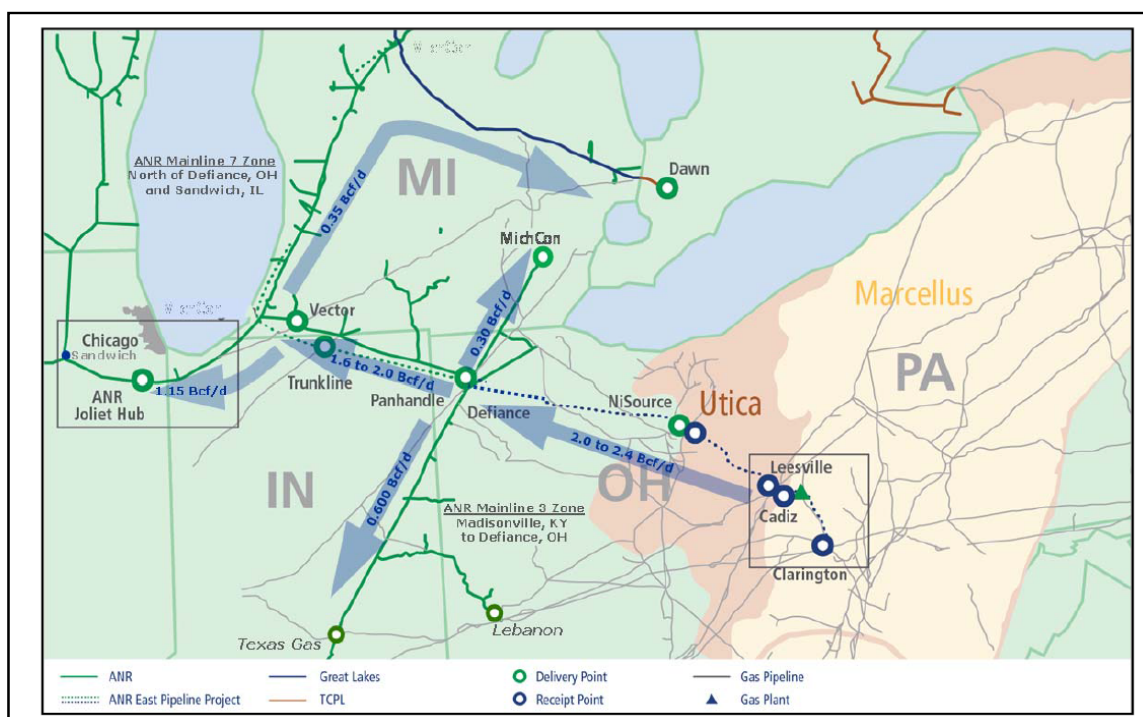


4.1.3 ANR East

ANR East would add up to 2 Bcfd from Clarington, Ohio to Leesville, Ohio and from there up to 2.4 Bcfd to ANR's existing system at Defiance, Ohio. The project would provide additional pipeline capacity from Southeast Ohio into the Defiance interconnect to access markets in the U.S. Midwest and Gulf Coast. About 0.3 Bcfd of capacity would carry through to the DTE citygate, and about 0.35 Bcfd of capacity from the Marcellus/Utica into Ontario would be added using existing Great Lakes Gas Transmission and TransCanada Pipeline capacity. Exhibit 4-3 shows the route.

¹² Energy Transfer Partners Press Release, October 30, 2014,
<http://ir.energytransfer.com/phoenix.zhtml?c=106094&p=irol-newsArticle&ID=1984104>

Exhibit 4-3: ANR East



According to DTE Gas, the NEXUS project as currently planned is intended to serve local distribution companies, industrial energy consumers and natural gas-fired power generators in the Ohio, Michigan, and Ontario areas. The Rover Pipeline and ANR East Project appear to be designed to also interconnect with other pipeline projects to ship gas to the Gulf Coast.

4.2 Comparison of Pipeline Options

All three of the proposed pipelines will benefit Michigan natural gas consumers by reducing prices at the Michigan Citygates, and providing an additional competitive supply option for natural gas purchases that will lead to lower prices in other supply basins relied on by DTE Gas and other Michigan utilities and consumers.

However, the three pipelines target different groups of customers, and have different physical layouts and pipeline interconnects. As a result, each of the three pipelines will have a somewhat different impact on Michigan natural gas markets.

The NEXUS pipeline follows a more direct path from Appalachian Basin through Michigan and into Ontario near Dawn. NEXUS also has fewer direct interconnects with the major pipelines from the Gulf Coast markets than either Rover or ANR East. As a result, NEXUS appears to be targeted primarily to customers desiring to move gas into Michigan and Ontario markets, while the Rover and ANR East projects appear to be designed to more easily interconnect with other pipeline projects that could ship gas to the Gulf Coast.

As a result, NEXUS likely will deliver a higher percentage of gas flowing on the pipeline into the markets around the DTE Gas service territory than the other pipelines, and will have a bigger impact on the DTE Gas markets.

The more direct connection provided by NEXUS will provide additional liquidity to gas markets around the DTE Citygate by ensuring that the majority of the incremental capacity provided by the project is used to delivery gas into Michigan markets, rather than into pipelines for transportation to the Gulf Coast. The NEXUS customer base in Ontario will also ensure that NEXUS gas flows through Michigan, supporting liquidity in Michigan markets.

The direct connection also reduces the amount of the project capacity that will be used to ship gas to other pipelines for transportation to the Gulf Coast. This will reduce competition for pipeline capacity from Gulf Coast shippers, which should reduce market volatility.

4.3 Comparison of Pipeline Costs

Based on the public information provided by the other two pipelines, and the information on contract costs on NEXUS provided to ICF by DTE Gas, the NEXUS pipeline would be less expensive than either Rover or ANR East for DTE Gas. The costs of the three pipeline options are illustrated in Exhibit 4-5, which shows the fully allocated, 100% load factor cost of the three pipelines.

Looking only at the fixed costs, NEXUS would be \$0.77 per Dth from Kensington, (including estimated average fuel costs), compared to \$0.91 per Dth from Leesville or Cadiz for Rover, \$0.80 per Dth for ANR East from Leesville, and \$0.89 per Dth for ANR East from Clarington. (These are the maximum “recourse” rates, i.e., rates calculated under FERC cost-of-service ratemaking principles.)

The Tier I and Tier II Foundation shipper rates on ANR East are lower than the max recourse rates. However, foundation shipper status on ANR East would have required a 20-year commitment for a minimum of 250,000 Dth per day, which is significantly greater than the commitment that DTE is planning to make with NEXUS. In addition, the higher level of capacity commitment required to secure the lower rates exceeds the amount of pipeline capacity in the DTE Gas portfolio that is scheduled to expire before November 2017.

Exhibit 4-4: Cost Comparison of Alternative Pipeline Options

Receipt Point	Capacity (\$/Dth)	Commodity (\$/Dth)	Fuel (%) ⁴	Minimum Contract Term (Years)	Minimum Contract Capacity (Dth)	Fuel Cost @ \$6.18 (\$/Dth) ⁵	Total Cost (\$/Dth) ⁶
NEXUS Pipeline¹							
Kensington	\$0.695	\$0.0012	1.22%	15		\$0.08	\$0.77
ROVER Pipeline²							
Leesville, Cadiz	\$0.800	\$0.0012	1.80%	20		\$0.11	\$0.91
ANR East (Max Recourse Rates)³							
Leesville	\$0.680	\$0.0012	2.00%			\$0.12	\$0.80
Clarington	\$0.770	\$0.0012	2.00%			\$0.12	\$0.89
ANR East (Tier 1 Foundation Rates)³							
Leesville	\$0.430	\$0.0012	2.00%	20	250,000	\$0.12	\$0.55
Clarington	\$0.480	\$0.0012	2.00%	20	250,000	\$0.12	\$0.60
ANR East (Tier II Foundation Rates)³							
Leesville	\$0.470	\$0.0012	2.00%	20	250,000	\$0.12	\$0.59
Clarington	\$0.530	\$0.0012	2.00%	20	250,000	\$0.12	\$0.65

^{1/} Draft letter from NEXUS to Mark Stiers, DTE Gas Company, September 1, 2014. Provided to ICF by DTE Gas.

^{2/} ET Rover Pipeline Project BINDING OPEN SEASON, June 27, 2014.

^{3/} ANR Pipeline, Non-Critical Notice, "ANR East Project from Utica/Marcellus Basins Non-Binding Open Season", July 3, 2014. <http://anrebb.transcanada.com/Notices/NoticeView.asp?sPipelineCode=ANR&sSubCategory=NonCritical&sNoticeId=7119>

^{4/} Fuel percentage reflects the best current estimate. Where a range is provided (Rover), the fuel percentage represents the mid point of the range.

^{5/} Fuel cost of \$6.18 represents the average cost of gas at the NEXUS receipt point from November 2017 to October 2032.

^{6/} Total cost based on 100 percent load factor utilization.

The total non-gas costs of NEXUS and the alternative pipelines are shown in Exhibit 4-5. Rover costs will exceed NEXUS by an average of about \$3.6 million per year. Rover demand charges and usage costs are higher than NEXUS. ANR East has lower demand charges but considerably higher usage costs (fuel and commodity rate), resulting in an average annual premium to NEXUS of \$0.6 million per year.

Exhibit 4-5: Alternative Pipeline Cost Comparison (\$)

	Reservation Cost (75,000 Dthd)	Usage Cost @ 100% Load Factor	15 Year Total Cost	Annual Cost	Annual Cost over NEXUS
NEXUS	285,540,750	31,469,467	317,010,217	21,134,014	
Rover	328,680,000	46,195,974	374,875,974	24,991,732	3,857,717
ANR East					
Leesville	279,378,000	51,274,080	330,652,080	22,043,472	909,458
Clarington	316,354,500	51,274,080	367,628,580	24,508,572	3,374,558

Note: Fuel charge in usage cost for Rover and ANR is based on cost of gas into NEXUS.

4.4 Role of the DTE Gas Commitment to Advancing NEXUS

NEXUS was the first of the three major projects to be announced. In December, 2013, DTE Gas entered into a precedent agreement with NEXUS Partnership for 75,000 Dth/day of capacity on the NEXUS system for the fifteen year period from November 2017 through October 2032. Today, NEXUS is anchored by roughly equal commitments from end users in Michigan and Ontario and Marcellus/Utica producers. According to Spectra Energy:

NEXUS, which will bring supply diversity to Eastern Canada by delivering Utica and Marcellus gas by the end of 2017, has the signed customer support necessary to move forward and will be anchored by commitments from Eastern Canadian and Midwest LDCs as well as Appalachian producers.¹³

About half of the capacity has been anchored by the commitments from Eastern Canadian and Midwest LDCs, while the remaining half has been anchored by the Appalachian producers.¹⁴

While it is often difficult to determine whether a specific commitment for pipeline capacity is necessary to ensure construction of the project, the DTE Gas commitment was important to the initial development of the project, and remains important in ensuring that the project is sized appropriately, and remains competitive relative to the competing pipeline options available to the market.

¹³ Spectra Energy, "Spectra Energy Reports Second Quarter 2014 Results", August 6, 2014.
<http://investors.spectraenergy.com/phoenix.zhtml?c=204494&p=irol-newsArticle&ID=1955753>

¹⁴ Ibid

5 The Value of Nexus Capacity to DTE Gas' Distribution Customers

In this section, we present our analysis of the effect of NEXUS on gas prices and on DTE Gas' supply portfolio. This analysis has identified three benefits of NEXUS to DTE Gas and its customers.

First, incremental pipeline capacity from the Appalachian Basin into the Midwest, Michigan, and Ontario will lower gas prices relative to what they would be without the additional pipeline capacity into the region. This will benefit all Michigan natural gas consumers, including DTE Gas customers. Second, DTE Gas' commitment for 75,000 Dth/day of capacity on NEXUS will allow DTE Gas to re-optimize its gas pipeline capacity and gas supply purchasing portfolios, and reduce delivered gas costs to DTE Gas customers. In purchasing gas over NEXUS, DTE Gas will be able to reduce the total commodity cost of natural gas for system supply. NEXUS provides access to low cost supplies in the Marcellus and Utica basins that would otherwise be unavailable. Lastly, additional pipeline capacity into and through the DTE Gas service territory will also improve market liquidity and increase overall supply reliability. These benefits are addressed in more detail below.

5.1 Analytical Approach

Building incremental pipeline capacity from the Appalachian Basin into Michigan and beyond will have significant impacts on natural gas prices in the Appalachian Basin and in Michigan, as well as in the supply basins currently serving the Michigan and Ontario markets. However, the impact of adding additional pipeline capacity from the Appalachian Basin to Michigan markets is highly dependent on the total amount of incremental pipeline capacity built. Given the uncertainty with respect to total new capacity on this path that may be built in the next few years, the ICF analysis looked at five different pipeline capacity scenarios:

- 1) Status Quo Scenario: No new pipeline capacity added from the Appalachian Basin west to Midwestern and/or Ontario markets.
- 2) 1.5 Bcfd NEXUS Scenario: NEXUS is built at 1.5 BCFD.
- 3) 2.0 Bcfd NEXUS Scenario: NEXUS is built at 2.0 BCFD.
- 4) 3.25 Bcfd Scenario: Either Rover, or a combination of NEXUS and ANR East are built.
- 5) 4.75 Bcfd NEXUS and Rover Scenario: Both NEXUS and Rover proceed to completion.

For each scenario, ICF used the ICF Gas Markets Model (GMM©) to forecast natural gas prices at a variety of different natural gas market centers, including the market centers currently relied upon by DTE Gas in their current supply portfolio. The impact of the incremental pipeline capacity on the natural gas prices at each market where DTE Gas purchases natural gas was used to determine the total savings attributed to the pipeline capacity due to the decrease in natural gas prices.

The total cost savings were calculated for the DTE Gas' supply portfolio, given the current mix of gas purchases by market area. The total cost savings for all Michigan consumers were then estimated for each scenario based on the simplifying assumption that the gas supply portfolio for all Michigan gas consumers is similar to the DTE Gas' supply portfolio.

5.2 Impact of Incremental Pipeline Capacity on Michigan Supply Portfolio Costs

5.2.1 Impact of Incremental Pipeline Capacity on Natural Gas Prices

While all current supply points would see a decline in the price of gas with NEXUS, the supply at the point of NEXUS receipts would increase. This increase occurs because the availability of new pipeline capacity would eliminate a transportation constraint and allow more gas to flow. With less gas stranded in the supply region, gas prices there will increase to equilibrate with other regions. Nevertheless, the price of gas from the Marcellus would become the low-cost supply for DTE Gas. The price impacts for each pipeline capacity expansion scenario are shown in Appendix C. The price impacts for the 1.5 BCFD NEXUS Capacity scenario are shown in Exhibit 5-1.

The analysis resulted in a reduction of gas prices delivered to the DTE Gas by an average of \$0.25 per Dth over the 15 year period from November 2017 through October 2032. Prices at other supply points also declined as a result of the additional gas supply from Marcellus and Utica formations.

Exhibit 5-1: Impact of 1.5 Bcfd NEXUS on Supply Basin Prices Used by DTE Gas (\$/Dth)

Market Locations	Without Nexus	With Nexus	Impact of Nexus
MichCon Citygate	7.62	7.37	(0.25)
Great Lakes	7.59	7.36	(0.23)
Viking/ANR ML-7	7.59	7.36	(0.23)
Vector	7.43	7.24	(0.19)
Panhandle Field Zone	7.01	6.89	(0.12)
ANR Alliance	7.43	7.24	(0.19)
ANR SW	6.96	6.84	(0.12)
Nexus Receipt Point	5.94	6.21	0.27

5.2.2 Impact of Change in Natural Gas Prices on Michigan Natural Gas Costs

The change in natural gas prices at the different market centers projected by ICF for the different level of pipeline capacity expansions between the Appalachian Basin and the Midwest through Michigan and into Ontario is projected to lead to a reduction in natural gas costs to Michigan consumers of between \$2.0 billion and \$4.0 billion over the 15-year period from November 2017 through October 2032. For DTE Gas customers, the savings will range from \$318 million to \$633 million. The values for the specific pipeline capacity expansion scenarios are shown in Exhibit 5-2:

Exhibit 5-2: Impact of New Pipeline Capacity from Eastern Ohio into Michigan on Total Natural Gas Supply Costs^{1/}

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Customers (Million \$) ^{1/2}	Michigan Consumers (Million \$) ^{1/3}
1.50 BCFD	-\$318	-\$2,026
2.00 BCFD	-\$385	-\$2,451
3.25 BCFD	-\$486	-\$3,097
4.75 BCFD	-\$633	-\$4,032

^{1/} November 2017 through October 2032.

^{2/} Based on gas price reduction, without any changes in supply portfolio or pipeline capacity portfolio.

^{3/} DTE Gas supply portfolio represents 15.7 percent of total Michigan natural gas purchases.

The calculation of supply costs for each pipeline expansion scenario is included in Appendix C.

The assessment of the impact on DTE Gas' supply portfolio costs is based on the existing DTE Gas supply purchasing portfolio, calculated using the different natural gas prices for each different level of pipeline capacity. ICF did not have the data necessary to conduct a detailed assessment on the sources of natural gas supply for Michigan consumers outside of the DTE Gas service territory. Instead, we have estimated the total benefits to Michigan based on the simplifying assumption that other natural gas consumers in Michigan would have a supply purchase portfolio similar to the DTE Gas portfolio. ICF used 2013 Michigan consumption as reported by the Energy Information Administration (EIA) of 813 Bcf relative to DTE Gas' gas sales of 128 Bcf to estimate overall savings for Michigan.

5.3 Impact of NEXUS Capacity on DTE Gas Supply Portfolio

In order to evaluate the impact on the DTE Gas supply portfolio of the DTE Gas decision to contract for pipeline capacity on NEXUS, ICF estimated the costs of the DTE Gas supply portfolio with and without holding capacity on NEXUS.

5.3.1 Existing DTE Gas Transportation Contracts

DTE Gas currently holds interstate pipeline capacity on eight different pipeline corridors shown in Exhibit 5-3. The DTE Gas GCR supply plan also allows for purchases at the DTE Gas citygate. The capacity on the different pipeline corridors allows DTE Gas to purchase natural gas supply from a diverse set of supply basins and natural gas markets, and allows its customers to benefit from regional diversity of supply with increased supply reliability and mitigated price risk. Supply location diversity helps the DTE Gas mitigate adverse effects of major disruptions in the general industry supply chain. If supply becomes constrained in a particular supply basin, then a diverse supply portfolio helps in insulating DTE Gas and its customers from the risk of potential supply disruptions in that area.

Exhibit 5-3: DTE Gas Pipeline Transportation Capacity (Dth/Day)

Pipeline	Winter	Summer
Great Lakes	30,390	30,390
Viking/ANR ML-7	21,000	21,000
Vector	50,000	50,000
Panhandle Field Zone	75,000	75,000
Trunkline/Panhandle	50,000	-
ANR/Alliance	50,000	50,000
ANR SW	104,000	104,000
ANR SE	20,000	10,000
Total Contracted Pipeline Capacity	400,390	340,390

5.3.2 Impact NEXUS Capacity on DTE Gas Pipeline Capacity Portfolio

Currently, DTE Gas does not purchase any gas supply in the Appalachian Basin. DTE Gas has committed, subject to certain conditions, to a 15-year transportation contract with NEXUS Gas Transmission to transport up to 75 MDth/d of Utica and Marcellus shale production gas from the Appalachian Basin in Eastern Ohio to Michigan beginning in November 2017.

A primary benefit of DTE Gas holding firm capacity on NEXUS would be that it would allow DTE to reduce capacity on other pipelines and re-optimize its gas pipeline capacity portfolio and purchase gas in ways to reduce overall supply costs. DTE Gas natural gas transportation capacity requirements are not projected to increase over the period of this analysis. Contracting for NEXUS capacity is expected to result in release of existing pipeline capacity of roughly the same maximum daily quantities (MDQ) as contracted for on NEXUS. The NEXUS capacity would replace up to 75,000 Dth/d of existing interstate pipeline capacity for a period of 15 years beginning in November 2017.

The analysis includes an assessment of future pipeline tolls on the pipeline capacity that DTE Gas will hold in its portfolio during the initial NEXUS contract period. The tolls for each of the pipeline supply options included in the DTE Gas portfolio are shown in Exhibit 5-4 below:

Exhibit 5-4: Pipeline Tolls Used in ICF Analysis

	100% Load Factor Capacity Cost (\$/Dth)	Commodity (\$/Dth)	Fuel (%)
MichCon Citygate	\$0.00	\$0.00	0.00%
Great Lakes	\$0.77	\$0.01	0.75%
Viking/ANR ML-7	\$0.29	\$0.03	0.10%
Vector	\$0.21	\$0.00	1.70%
Panhandle Field Zone	\$0.41	\$0.04	5.98%
Trunkline/Panhandle	\$0.47	\$0.03	3.89%
ANR Alliance	\$0.08	\$0.01	0.91%
ANR SW	\$0.31	\$0.02	3.70%
ANR SE	\$0.19	\$0.02	2.37%
Nexus	\$0.70	\$0.00	1.22%

Source: Calculated from DTE Gas Company 5-Year Natural Gas Supply Portfolio Forecast Case No.U-17332, December 20, 2013, and from current pipeline tariffs.

During the term of the existing contracts, we have assumed that tolls will remain at existing levels. Many of the DTE Gas pipeline contracts will expire prior to, or during the contract period on the NEXUS pipeline. It is uncertain whether DTE Gas will be able to renegotiate better rates on existing pipeline capacity, or will be forced to return to the recourse rates for contracts that are currently below the recourse rate. Rather than project potential changes in pipeline rate discounting practices in the future to determine rates on the expiring contracts, we have assumed that the contracts will be rolled over at the existing rates paid by DTE Gas, including the negotiated tolls that in some cases are below the current FERC approved recourse rates. These rates are held constant throughout the analysis (November 2017 through October 2032).

Certain elements of the MichCon pipeline capacity portfolio are required to meet the operational needs of the DTE Gas system, such as providing supply to parts of the system otherwise inaccessible, and could not be replaced by the NEXUS capacity. These contracts include those with Great Lakes, ANR Alliance, and Viking/ANR ML-7.

In addition, due to the structure and length of the existing pipeline contracts, it is likely that certain contracts cannot be released under contract terms. These include the long term contracts on Panhandle Eastern that do not expire until 2028 and 2029, and the contract on ANR from Alliance that does not expire until 2028.

ICF relied upon DTE Gas to identify the specific changes in pipeline contracts that would be made when NEXUS capacity is added to the pipeline portfolio. Based on their review of existing pipeline capacity contracts, DTE Gas would expect to allow the contracts shown in Exhibit 5-5 to expire, or be renewed at a lower level if they proceed with the NEXUS capacity. This set of potential contract revisions was based on knowledge available to DTE Gas at this time; the actual contract decisions will be delayed until necessary, based on the contract renewal provisions.

Exhibit 5-5: Changes in DTE Gas Pipeline Capacity Portfolio due to NEXUS

Pipeline/Contract #	Capacity (Dth/d)	Action
Panhandle Eastern #26812 (Field Zone)	10,000	Allow to expire
Panhandle Eastern #41525 (Field Zone)	20,000/10,000	Reduce to 10,000/0
Vector #FT1-MCG-026, 026a	50,000	Allow to expire
ANR #122247 (Willow Run)	15,000	Reduce to 10,000
Total Reductions	75,000	

In total, these changes would reduce annual pipeline capacity by 75,000 Dth per day, fully offsetting the increase in pipeline capacity under contract from the NEXUS contract. Exhibit 5-6 shows the DTE Gas pipeline capacity portfolio as of November 1, 2017 after the addition of the NEXUS capacity and the release of the contracts above.

Exhibit 5-6: DTE Gas Pipeline Capacity Portfolio with NEXUS

DTE Pipeline Capacity Portfolio As of 11/1/2017 After Addition of NEXUS								
DTE Contract#	Pipeline	Service	Receipt Point	Delivery Point	MDQ (Winter)	MDQ (Summer)	Start Date	Termination Date
109511	ANR Pipeline	FTS-1	SW Headstation	Sparta-Muskegon	50,000	50,000	2017/11/01	TBD
108268	ANR Pipeline	ETS	SW Headstation	Group 1	10,000	10,000	2017/11/01	TBD
108304	ANR Pipeline	ETS	SW Headstation	Group 2	15,000	15,000	2017/11/01	TBD
122247	ANR Pipeline	FTS-1	SW Headstation	Willow Run	10,000	10,000	2017/11/01	TBD
122067	ANR Pipeline	FTS-1	SW Headstation	Menominee/ Willow Run	14,000	14,000	2017/04/01	TBD
112065 *	ANR Pipeline	FTS-1	Alliance	Alpena	50,000	50,000	2001/01/14	2028/04/30
122248	ANR Pipeline	FTS-1	Marshfield	Menominee	21,000	21,000	2017/04/01	TBD
FT-A (AF0081)	Viking Gas Transmission	FT	Emerson	Marshfield	21,076	21,076	2017/04/01	TBD
FT17664	Great Lakes Gas Transmission	FT	Belle River	Various	50,000	50,000	2017/04/01	TBD
FT4634	Great Lakes Gas Transmission	FT	Emerson / Belle River	Various	10,130	10,130	2004/01/05	Evergreen
FT4635	Great Lakes Gas Transmission	FT	Emerson / Belle River	Various	20,260	20,260	2004/01/05	Evergreen
17908	Panhandle Eastern Pipe Line	EFT	Field Zone	MCON/Southern	25,000	25,000	2011/01/03	2028/10/31
18474	Panhandle Eastern Pipe Line	FT	Field Zone	MCON/Southern	40,000	40,000	2004/01/02	2029/03/31
40240	Panhandle Eastern Pipe Line	FT	Bourbon/Tuscola	MCON	50,000	-	2017/04/01	TBD
29464	Trunkline Gas Company	FT	E. LA	Bourbon/Tuscola	50,000	-	2017/04/01	TBD
41525	Panhandle Eastern Pipe Line	FT	Field Zone	MCON	10,000	-	2017/10/02	TBD
	Nexus		Ohio Producing/Ke	Willow run	75,000	75,000	11/1/2017	2032/10/31

Blue values reflect changes to the pipeline portfolio required due to renewals of expiring contracts.

Red values reflect the changes in the remaining pipeline portfolio in response to the NEXUS contract.

The net effect of the conversion of these pipeline contracts to NEXUS contracts will increase the fixed costs of pipeline firm transportation. ICF estimates that the increase will be on the order of \$11.6 million per year as shown in Exhibit 5-7. The table shows reduced capacity costs for the pipelines where contracts will be allowed to expire or MDQs reduced (Vector, Panhandle, and ANR SW), and the addition of NEXUS costs. However, the additional cost of pipeline capacity will be more than made up in lower overall portfolio costs as described in the next subsections.

Exhibit 5-7: Annual Pipeline Reservation Costs with and without NEXUS

Pipeline	W/O NEXUS	W/NEXUS
Great Lakes	\$8,563,896	\$8,563,896
Viking/ANR ML-7	\$2,222,436	\$2,222,436
Vector	\$3,919,140	-
Panhandle Field Zone	\$11,259,588	\$8,257,031
Trunkline/Panhandle	\$3,547,250	\$3,547,250
ANR Alliance	\$1,497,600	\$1,497,600
ANR SW	\$11,614,080	\$11,055,711
ANR SE	\$982,464	\$982,464
Nexus	-	\$19,025,625
Total	\$43,606,454	\$55,152,013

5.4 Impact of NEXUS Capacity on DTE Gas Supply Portfolio

Having capacity on NEXUS will change the pattern of natural gas purchases by DTE Gas. The price of natural gas at the NEXUS receipt point is expected to provide the lowest cost opportunity to purchase natural gas supply for DTE Gas during almost all time periods. The difference will be substantial enough that even with the higher cost of NEXUS demand charges, the delivered cost of Marcellus/Utica gas over NEXUS will be the lowest or among the lowest cost sources of supply for DTE Gas, due to a combination of low-cost supply, no commodity charge, and a low fuel percentage (1.22%).

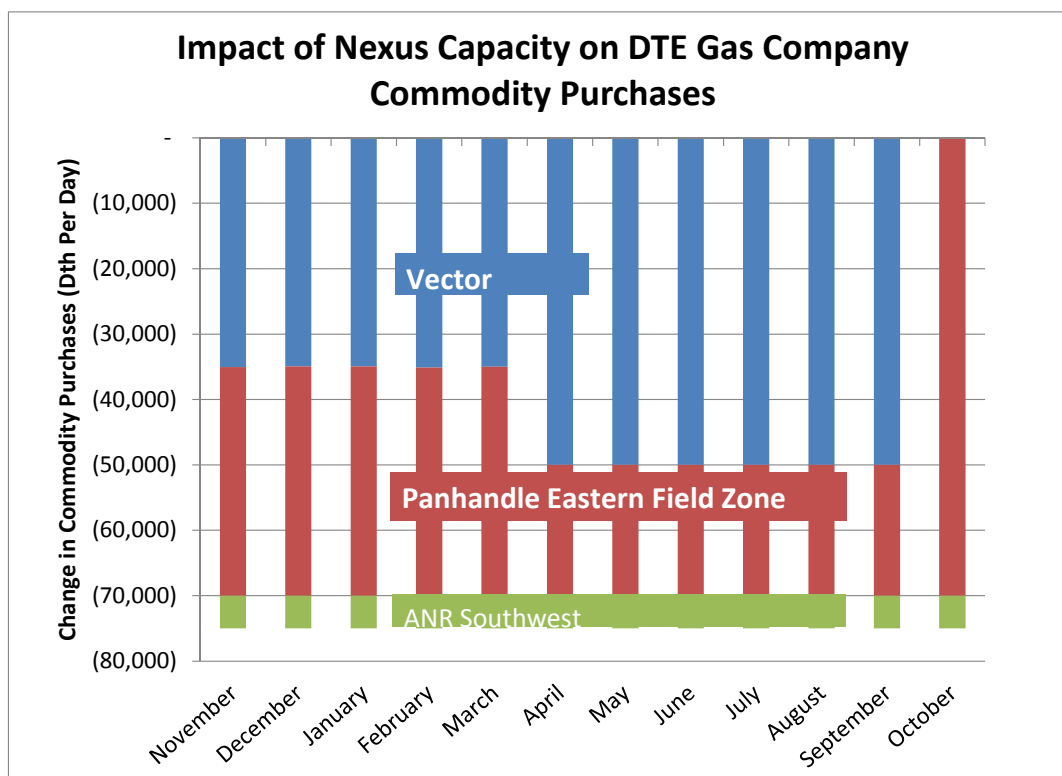
Exhibit 5-8 shows ICF's forecast of average delivered gas costs over the pipelines serving DTE Gas with and without NEXUS for three time periods corresponding to gas years for the 1.5 Bcfd NEXUS scenario. It should be noted that with NEXUS, delivered costs of all of the pipelines are lower than without NEXUS. Except for the first five years, NEXUS supplies will be the lowest cost into the DTE Gas Citygate.

ICF expects DTE Gas to maximize throughput over NEXUS at or close to 100% load factor. This will reduce the flows on other pipelines. Using a merit order of pipeline utilization that minimizes the average cost of gas at the Citygate, and accounting for some pipeline/supply paths that must be used despite their rank in the merit order, ICF has projected the change in average daily commodity purchases by month. The overall decline in flows of 75,000 Dth per day shown in Exhibit 5-9 correspond to the increase in purchased from the Appalachian Basin that will be delivered using the NEXUS pipeline capacity.

Exhibit 5-8: Citygate Delivered Gas Cost by Pipeline (\$/Dth)

Pipelines	Gas Years		
	2017/18 to 2021/22	2022/23 to 2026/27	2027/28 to 2031/32
Without NEXUS			
MichCon Citygate	6.11	7.48	9.26
Great Lakes	8.21	9.60	11.38
Viking/ANR ML-7	6.42	7.80	9.56
Vector	6.32	7.65	9.45
Panhandle Field Zone	6.46	7.75	9.52
ANR Alliance	6.12	7.44	9.21
ANR SW	6.15	7.40	9.12
NEXUS	No NEXUS		
With NEXUS			
MichCon Citygate	5.98	7.17	8.95
Great Lakes	8.09	9.31	11.10
Viking/ANR ML-7	6.29	7.50	9.28
Vector	Allowed to expire		
Panhandle Field Zone	6.83	7.98	9.75
ANR Alliance	6.03	7.20	8.97
ANR SW	6.12	7.23	8.95
NEXUS	6.09	6.65	8.23

Exhibit 5-9: Impact of NEXUS Capacity on DTE Gas Company



The change in purchase patterns is reflected in a significant rebalancing of the DTE Gas supply portfolio, shown in Exhibit 5-10.

Exhibit 5-10: Impact of NEXUS on DTE Gas Supply Diversity

	Without Nexus	With Nexus
MichCon Citygate	13%	13%
Chicago/Midwest	25%	14%
Mid-Continent	51%	41%
Western Canadian Sedimentary Basin	11%	11%
Appalachian Basin	0%	21%
Total	100%	100%

5.5 Impact of NEXUS on DTE Gas Supply Portfolio Costs

In this section, we estimate the savings that would occur as a result of DTE Gas holding 75,000 Dth of capacity on NEXUS and purchasing gas in the Marcellus/Utica formations as part of a re-optimized supply portfolio. NEXUS would allow DTE Gas to reduce purchases from some sources in favor of the lower cost gas supplies expected to be available at the NEXUS receipt point.

The net cost savings to DTE Gas customers from holding NEXUS capacity are projected to range from \$257 million in the pipeline scenario (where only 1.5 Bcf per day of capacity is built from the Appalachian Basin to the Midwest) to \$39 million if 4.75 Bcf per day of capacity is developed along within this corridor.

Based on the assessment of commodity prices in each of the four different pipeline expansion scenarios, the value of holding NEXUS pipeline capacity is highest in the scenarios where only NEXUS capacity is built from the Appalachian Basin. As additional capacity is built, the price of gas in the Appalachian Basin is expected to increase relative to other supply basins, reducing the potential value of holding NEXUS capacity. However, even in the most aggressive pipeline capacity scenario considered— where both NEXUS and Rover are built and total pipeline capacity expansions from the Appalachian Basin into the Midwest reach 4.75 Bcfd—holding NEXUS capacity continues to provide significant benefits to DTE Gas customers. ICF's estimates of the additional savings arising from a revised purchasing pattern for each of the four pipeline capacity scenarios including the NEXUS Pipeline expansion are shown in Exhibit 5-11.

The pattern of these portfolio savings is also of interest. Exhibit 5-12 provides a graphical representation of annual savings each year for the 1.5 Bcf/day capacity scenario. The savings start in the first year of the contract, and generally increase over time. The increase is a result of the Base Case forecast of expanding Marcellus/Utica production, leading to lower gas prices in the Appalachian basin relative to other sources of gas for DTE Gas.

Exhibit 5-11: Impact of Contracting for 75,000 Dth/Day of NEXUS Pipeline Capacity on DTE Gas Supply Portfolio Costs

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Gas Supply Portfolio Cost (Million \$)		Change in Supply Portfolio Cost Due to NEXUS (Million \$)	Annual Change in Supply Portfolio Cost Due to NEXUS (Million \$)
	Without The NEXUS Capacity Contract	With the NEXUS Capacity Contract		
No New Capacity	\$14,930	N.A.	N.A.	N.A.
1.50 BCFD	\$14,612	\$14,355	-\$257	-\$17
2.00 BCFD	\$14,545	\$14,336	-\$209	-\$14
3.25 BCFD	\$14,444	\$14,334	-\$109	-\$7
4.75 BCFD	\$14,297	\$14,258	-\$39	-\$3

^{1/} November 2017 through October 2032.

^{2/} Including gas purchase costs, pipeline capacity costs, pipeline commodity costs, and pipeline fuel costs.

Exhibit 5-12: Impact of NEXUS on Annual DTE Gas Supply Portfolio Costs

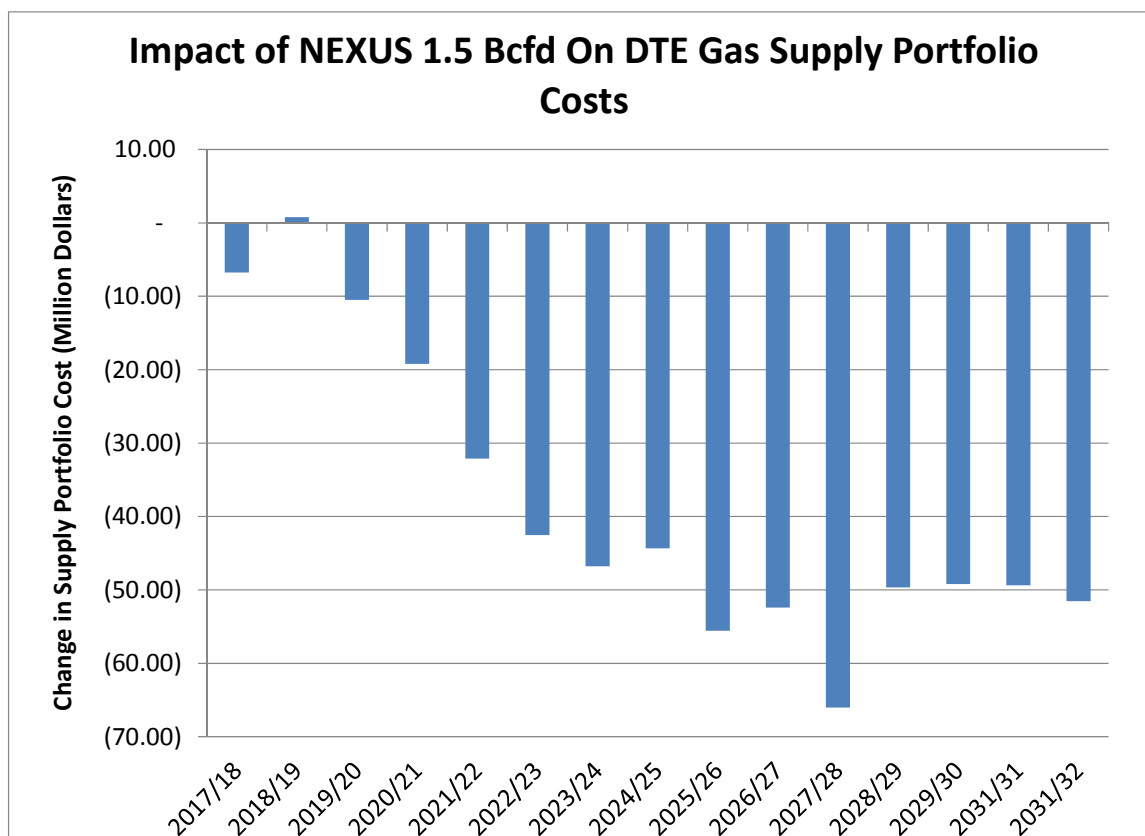


Exhibit 5- provides additional detail on the impact of holding NEXUS capacity on DTE Gas supply portfolio costs for each of the different pipeline expansion scenarios evaluated. This exhibit breaks out the costs with and without NEXUS capacity for pipeline capacity costs, pipeline fuel and usage costs, and commodity purchase costs.

Exhibit 5-13: Impact of Holding NEXUS Capacity on Supply Portfolio Costs (Million \$)

No New Pipeline Capacity from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact
	With NEXUS	Without NEXUS	Impact of NEXUS	
Pipeline Capacity Costs	N.A.	\$654	N.A.	N.A.
Pipeline Fuel and Usage Costs	N.A.	\$425	N.A.	N.A.
Commodity Purchase Costs	N.A.	\$13,850	N.A.	N.A.
Total Supply Portfolio Costs	N.A.	\$14,930	N.A.	N.A.
1.5 Bcfd of New Pipeline Capacity from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact
	With NEXUS	Without NEXUS	Impact of NEXUS	
Pipeline Capacity Costs	\$827	\$654	\$173	\$11.54
Pipeline Fuel and Usage Costs	\$337	\$415	(\$79)	(\$5.25)
Commodity Purchase Costs	\$13,191	\$13,542	(\$351)	(\$23.43)
Total Supply Portfolio Costs	\$14,355	\$14,612	(\$257)	(\$17.14)
2.0 Bcfd of New Pipeline Capacity from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact
	With NEXUS	Without NEXUS	Impact of NEXUS	
Pipeline Capacity Costs	\$827	\$654	\$173	\$11.54
Pipeline Fuel and Usage Costs	\$335	\$413	(\$78)	(\$5.22)
Commodity Purchase Costs	\$13,174	\$13,478	(\$304)	(\$20.25)
Total Supply Portfolio Costs	\$14,336	\$14,545	(\$209)	(\$13.92)
3.25 Bcfd of New Pipeline Capacity from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact
	With NEXUS	Without NEXUS	Impact of NEXUS	
Pipeline Capacity Costs	\$827	\$654	\$173	\$11.54
Pipeline Fuel and Usage Costs	\$332	\$411	(\$78)	(\$5.22)
Commodity Purchase Costs	\$13,175	\$13,379	(\$204)	(\$13.60)
Total Supply Portfolio Costs	\$14,334	\$14,444	(\$109)	(\$7.28)
4.75 Bcfd of New Pipeline Capacity from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact
	With NEXUS	Without NEXUS	Impact of NEXUS	
Pipeline Capacity Costs	\$827	\$654	\$173	\$11.54
Pipeline Fuel and Usage Costs	\$329	\$406	(\$77)	(\$5.13)
Commodity Purchase Costs	\$13,102	\$13,237	(\$135)	(\$8.99)
Total Supply Portfolio Costs	\$14,258	\$14,297	(\$39)	(\$2.58)

5.6 Total Impact of NEXUS Capacity on DTE Gas Supply Portfolio

The benefits accruing to DTE Gas customers and to Michigan gas consumers due to the impact of the development of pipeline capacity from the Appalachian Basin into Michigan on natural gas prices, and the benefits to DTE Gas customers of holding capacity on the NEXUS pipeline are cumulative. When the benefits of holding 75,000 Dth of pipeline capacity on NEXUS are added to the gas cost savings associated with the increase in pipeline capacity from the Appalachian Basin to Michigan, the total reduction in gas supply portfolio costs for DTE Gas customers ranges from \$575 million to \$672 million, and the total cost savings to all Michigan gas consumers ranges from \$2.3 billion to \$4.1 billion, depending on the amount of pipeline capacity constructed. The total impact of new pipeline capacity is shown in Exhibit 5-14.¹⁵

Exhibit 5-14: Total Impact of New Pipeline Capacity from Eastern Ohio into Michigan on Michigan Natural Gas Supply Costs^{1,2}

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Gas Customers (Million \$)	All Michigan Consumers (Million \$) ³
1.50 BCFD	-\$575	-\$2,283
2.00 BCFD	-\$594	-\$2,660
3.25 BCFD	-\$595	-\$3,206
4.75 BCFD	-\$672	-\$4,071
^{1/} November 2017 through October 2032.		
^{2/} Includes the impact of 75,000 Dth of NEXUS Capacity in the DTE Gas supply portfolio.		
^{3/} DTE Gas supply portfolio represents 15.7 percent of total Michigan natural gas purchases.		

5.7 Benefit of Supply Diversity Provided by Holding NEXUS Capacity

Holding Nexus capacity will allow DTE Gas to significantly diversify its existing natural gas supply portfolio. Currently, none of the gas in the DTE portfolio is sourced directly from the Appalachian Basin. After the NEXUS contract is in place, DTE would be able to purchase about 21% of its gas supply from this source. The Appalachian Basin is the fastest growing supply basin in North America, and natural gas prices there are projected to be lower than any other major supply basin in North American after 2020. As a result, holding NEXUS capacity will provide DTE Gas with direct access to a major new low cost natural gas market.

The NEXUS contract also allows DTE Gas to reduce purchases from other supply basins, including the WCSB in Canada and the Midcontinent in the U.S. This increase of supply diversity should reduce price volatility and increase supply reliability. The volatility reduction arises from both the lower volatility of gas prices in the Marcellus as well as the larger overall pipeline capacity into the region that reduces system constraints.

¹⁵ The benefits to Michigan consumers do not include potential benefits from parties other than DTE Gas that might also hold capacity on NEXUS.

The increasing importance of the Appalachian Basin increases the supply risk associated with the other supply basins relied upon by DTE Gas. Growth in Appalachian Basin production and the resulting decline in overall gas prices will continue to put pressure on these producing regions, reducing production, and increasing prices in these regions relative to prices in the Appalachian Basin.

6 Conclusions

The broad changes in natural gas markets that have occurred in the last five years and are expected to continue to occur in the future are resulting in changes in the optimal supply portfolio for DTE Gas.

The most important change is the growth in natural gas production from the Marcellus and Utica plays in the Appalachian Basin. As the Appalachian Basin becomes more important, and as prices in the Appalachian Basin decline relative to other sources of supply available to DTE Gas, the economics of natural gas supply from the different available sources is changing. The Appalachian Basin is projected to become the lowest priced source of natural gas available to DTE Gas by 2021, while Mid-Continent, Canadian and Gulf Coast supplies are projected to become increasingly more expensive.

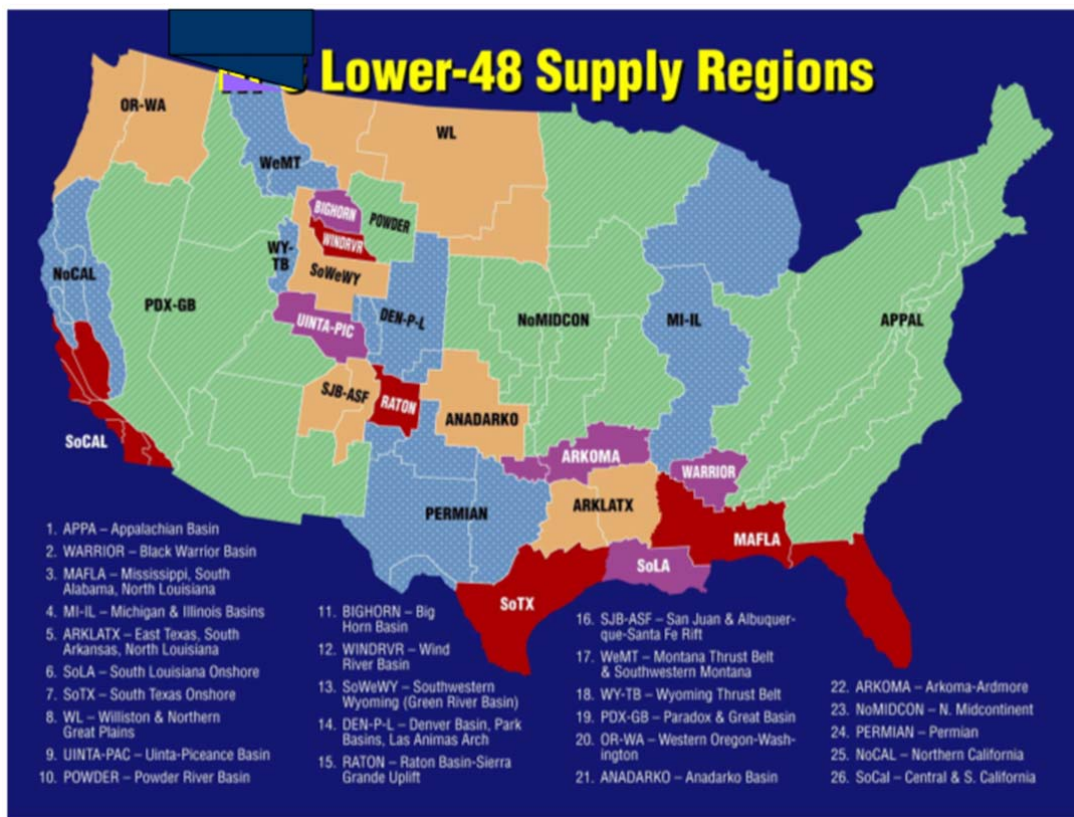
ICF has evaluated the impact of a range of different pipeline capacity options that might be developed to bring natural gas from the Appalachian Basin to the Midwest and the DTE Citygate. Under all of the scenarios evaluated, the incremental pipeline capacity provides substantial benefits to both DTE Gas customers and to Michigan natural gas consumers as a whole. ICF is projecting savings to DTE Gas customers of between \$575 and \$672 million over the 15 year period from November 2017 to October 2032, depending on the level of pipeline capacity constructed. Savings to Michigan consumers are projected to be much larger, at between \$2.1 and \$4.1 billion. These savings will accrue to DTE Gas customers and Michigan natural gas consumers if the pipeline capacity is built, regardless of whether DTE Gas or other Michigan companies contract for capacity on the new pipelines.

In addition, holding capacity on the NEXUS pipeline will enable DTE Gas to save an additional \$39 to \$267 million over the 15 year contract period, depending on the total amount of new pipeline capacity developed.

Appendix A: ICF Natural Gas Supply Assessment Methodology

ICF's Natural Gas Supply Assessment Methodology (ISAM) covers the Continental United States, Alaska and Canada. The Continental United States is represented in 28 onshore regions (see Figure A-1) and 11 offshore regions.

Figure A-1: NPC Continental US Supply Regions



Alaska is divided into seven regions and Canada is divided into ten regions. All regions are further broken out into subregions or “intervals.” They represent some combination of drilling depths, water depth, or geographic areas.

Resources are divided into three general categories: new fields/new pools, field appreciation, and unconventional gas. The methodology for resource characterization and economic evaluation differs for each.

New Fields

New discoveries are characterized by size class. For the United States, the number of fields within a size class is broken down into oil fields, high permeability gas fields, and low permeability gas fields based on the expected occurrence of each type of field within the region and interval being modeled. The fields are characterized further as having a hydrocarbon make-up containing a certain percent each of crude oil, dry natural gas, and natural gas liquids. In Canada, fields are oil, sweet nonassociated gas, or sour nonassociated gas.

The methodology uses a modified “Arps-Roberts” equation to estimate the rate at which new fields are discovered. The fundamental theory behind the find-rate methodology is that the probability of finding a field is proportional to the field's size as measured by its areal extent, which is highly correlated to the field's level of reserves. For this reason, larger fields tend to be found earlier in the discovery process than smaller fields. The new equation developed by ICF accurately tracks discovery rates for mid- to small-size fields. Since these are the only fields left to be discovered in many mature areas, the more accurate find-rate representation is an important component in analyzing the economics of exploration activity in these areas.

The find-rate equations are used in the model to predict the number of fields of a certain size that will be discovered after a given number of exploratory wells have been drilled. There are separate equations for each field-size class (e.g., size class 6 is between one and two million barrels of oil equivalent) within each depth interval, within each region. The Continental US portion of the model alone has over 3,000 separate find-rate equations. This is a very fine level of detail given that actual annual new field discoveries have been below 600 fields in recent years.

An economic evaluation is made in the model each year for potential new field exploration programs using a standard discounted after-tax discounted cash flow (DCF) analysis. This DCF analysis takes into account how many fields of each type are expected to be found and economics of developing each. There are about 7,000 prototype field development plans in the model for the Continental US that include all capital and operating costs and production timing specifications built up from historical data. The economic decision to develop a field is made using “sunk cost” economics where the discovery cost are ignored and only time-forward development costs and production revenues are considered. However, the model's decision to begin an exploration program includes all exploration and development costs.

The results for new field exploration are reported in standard output tables that show the marginal economics (internal rate of return and resource cost) of exploration in each region and interval throughout the forecast. There are also outputs in Excel and Access format showing the number of fields being found, recoverable hydrocarbons discovered and recoverable hydrocarbons developed.

Unconventional Gas

The ICF assessment method for shale gas is a “bottom-up” approach that first generates estimates of unrisked and risked gas-in-place (GIP) from maps of depth, thickness, organic content, and thermal maturity. Then, ICF uses a different model to estimate well recoveries and production profiles. Unrisked GIP is the amount of original gas-in-place determined to be present based upon geological factors— without risk reductions. “Risked GIP” includes a factor to reduce the total gas volume on the basis of proximity to existing production and geologic factors such as net thickness (e.g., remote areas, thinner areas, and areas of high thermal maturity have higher risk). ICF calibrates expected well recoveries with specific geological settings to actual well recoveries by using a rigorous method of analysis of historical well data. In late 2011, ICF undertook an extensive analysis of Marcellus well recoveries and compared them with model results with good correlation. ICF confirmed that the model well recoveries are conservative. Additional analysis in 2012 also confirmed these results.

Major Unconventional Natural Gas Categories

Definition of Unconventional Gas: *Quantities of natural gas that occur in continuous, widespread accumulations in low quality reservoir rocks (including low permeability or tight gas, coalbed methane, and shale gas), that are produced through wellbores but require advanced technologies or procedures for economic production.*

Tight Gas is defined as natural gas from gas-bearing sandstones or carbonates with an *in situ* permeability (flow rate capability) to gas of less than 0.1 millidarcy. Many tight gas sands have *in situ* permeability as low as 0.001 millidarcy. Wells are typically vertical or directional and require artificial stimulation.

Coalbed Methane is defined as natural gas produced from coal seams. The coal acts as both the source and reservoir for the methane. Wells are typically vertical but can be horizontal. Some coals are wet and require water removal to produce the gas, while others are dry.

Shale Gas is defined as natural gas from shale formations. The shale acts as both the source and reservoir for the methane. Older shale gas wells were vertical while more recent wells are primarily horizontal with artificial stimulation. Only shale formations with certain characteristics will produce gas.

Shale Oil with Associated Gas is defined as associated gas from oil shale in horizontal drilling plays such as the Bakken in the Williston Basin. The gas is produced through boreholes along with the oil.

Upstream Cost and Technology Factors

In ICF's methodology, supply technology advancements effects are represented in three categories:

- Improved exploratory success rates
- Cost reductions of platform, drilling, and other components
- Improved recovery per well

These factors are included in the model by region and type of gas and represent several dozen actual model parameters. ICF's database contains base year cost for wells, platforms, operations and maintenance, and other relevant cost items.

Appendix B: ICF's Gas Market Model (GMM®)

ICF's Gas Market Model (GMM®) is an internationally recognized modeling and market analysis system for the North American gas market. The GMM was developed in the mid-1990s to provide forecasts of the U.S. and Canada natural gas market under different assumptions. In its infancy, the model was used to simulate changes in the gas market that occur when major new sources of gas supply are delivered into the marketplace. Subsequently, GMM has been used to complete strategic planning studies for many private sector companies. The different studies include:

- Analyses of different pipeline expansions
- Measuring the impact of gas-fired power generation growth
- Assessing the impact of low and high gas supply
- Assessing the impact of different regulatory environments

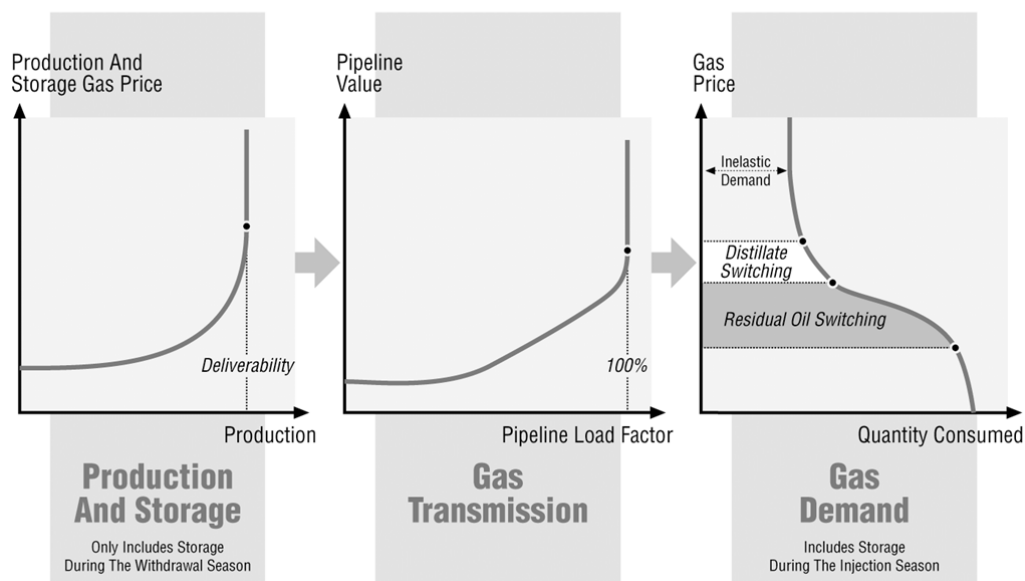
In addition to its use for strategic planning studies, the model has been widely used by a number of institutional clients and advisory councils, including Interstate Natural Gas Association of America (INGAA), which has relied on the GMM for multiple studies over the past ten years. The model was also the primary tool used to complete the widely referenced study on the North American Gas market for the National Petroleum Council in 2003, and the 2010 Natural Gas Market Review for the Ontario Energy Board.

GMM is a full supply/demand equilibrium model of the North American gas market. The model solves for monthly natural gas prices throughout North America, given different supply/demand conditions, the assumptions for which are specified by scenario. Overall, the model solves for monthly market clearing prices by considering the interaction between supply and demand curves at each of the model's nodes. On the supply-side of the equation, prices are determined by production and storage price curves that reflect prices as a function of production and storage utilization (Figure B-1) Prices are also influenced by "pipeline discount" curves, which reflect the change in basis or the marginal value of gas transmission as a function of load factor. On the demand-side of the equation, prices are represented by a curve that captures the fuel-switching behavior of end-users at different price levels. The model balances supply and demand at all nodes in the model at the market clearing prices determined by the shape of the supply and curves. Unlike other commercially available models for the gas industry, ICF does significant backcasting (calibration) of the model's curves and relationships on a monthly basis to make sure that the model reliably reflects historical gas market behavior, instilling confidence in the projected results.

Figure B-1: ICF's Gas Market Data and Forecasting System

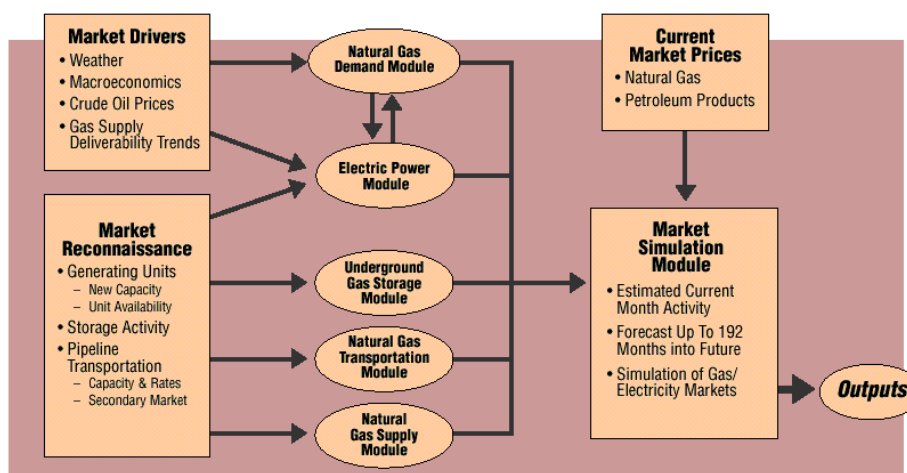
Gas Quantity And Price Response

EEA's Gas Market Data And Forecasting System



There are nine different components of GMM, as shown in Figure B-2. The user specifies input for the model in the “drivers” spreadsheet and then provides assumptions for weather, economic growth, oil prices, and gas supply deliverability, among other variables. ICF’s market reconnaissance keeps the model up to date with generating capacity, storage and pipeline expansions, and the impact of regulatory changes in gas transmission. This is important to maintaining model credibility and confidence of results.

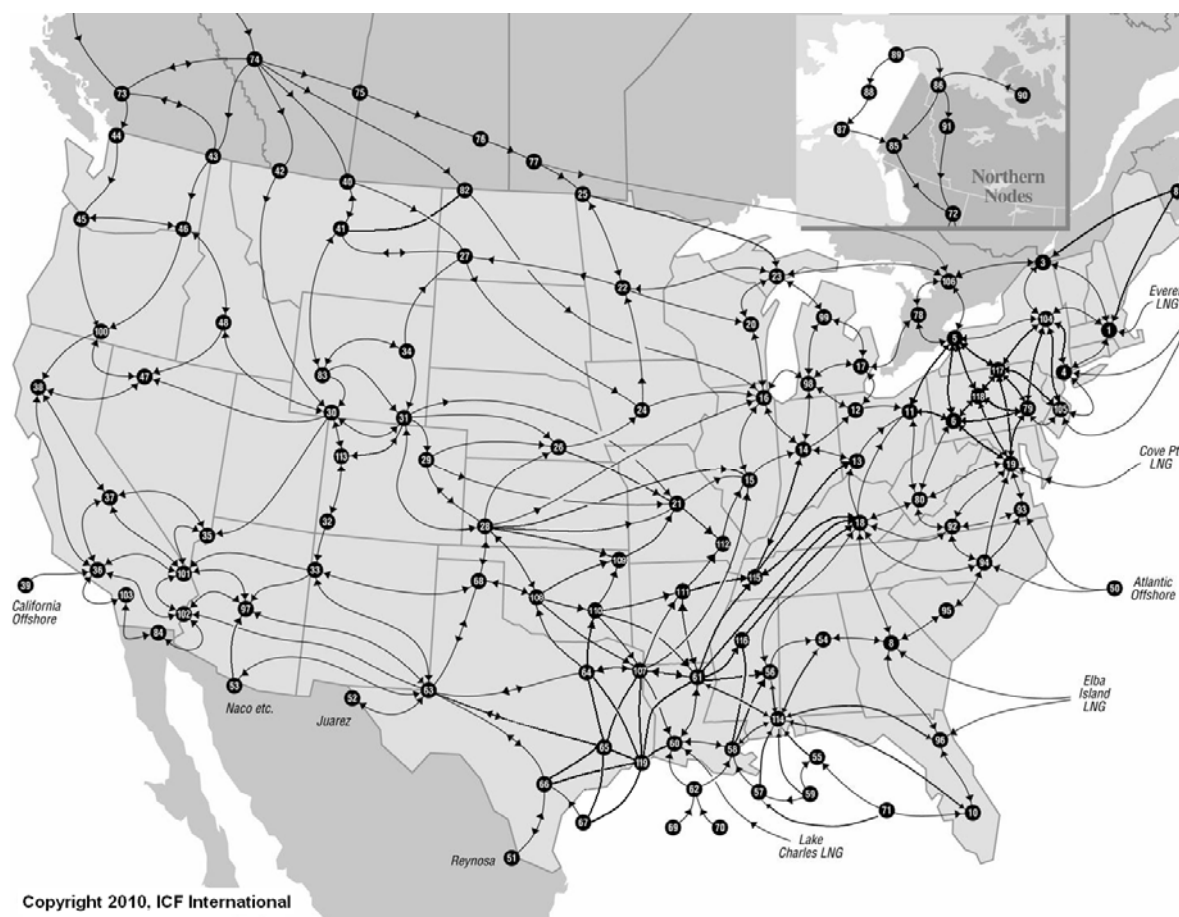
Figure B-2: GMM Components



The first model routine solves for gas demand across different sectors, given economic growth, weather, and the level of price competition between gas and oil. The second model

routine solves the power generation dispatch on a regional basis to determine the amount of gas used in power generation, which is allocated along with end-use gas demand to model nodes. The model nodes are tied together by a series of network links in the gas transportation module. The structure of the transmission network is shown in Figure B-3. The gas supply component of the model solves for node-level natural gas deliverability or supply capability, including LNG import and export levels. The last routine in the model solves for gas storage injections and withdrawals at different gas prices. The components of supply (i.e., gas deliverability, storage withdrawals, supplemental gas, LNG imports, and Mexican imports) are balanced against demand (i.e., end-use demand, power generation gas demand, LNG exports, and Mexican exports) at each of the nodes and gas prices are solved for in the market simulation module.

Figure B-3: GMM Transmission Network



Appendix C: DTE Gas Supply Portfolio Costs for Alternative Pipeline Capacity Scenarios

- C.1 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – No Capacity Expansion Scenario
- C.2 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 1.5 Bcfd Capacity Expansion Scenario
- C.3 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 1.5 Bcfd Capacity Expansion Scenario
- C.4 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 2.0 Bcfd Capacity Expansion Scenario
- C.5 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 2.0 Bcfd Capacity Expansion Scenario
- C.6 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 3.25 Bcfd Capacity Expansion Scenario
- C.7 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 3.25 Bcfd Capacity Expansion Scenario
- C.8 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 4.75 Bcfd Capacity Expansion Scenario
- C.9 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 4.75 Bcfd Capacity Expansion Scenario

C.1 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – No Capacity Expansion Scenario

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
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No Capacity Expansion Scenario																
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Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390
Source of Supply/ Transportation Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

Michigan Public Service Commission																	
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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000

Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%

Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.84	\$5.61	\$6.86	\$6.66	\$6.57	\$7.21	\$7.13	\$7.31	\$7.78	\$7.98	\$8.60	\$8.97	\$9.30	\$9.56	\$9.89	\$7.62
Great Lakes	\$4.82	\$5.58	\$6.83	\$6.64	\$6.55	\$7.19	\$7.10	\$7.29	\$7.76	\$7.97	\$8.58	\$8.95	\$9.27	\$9.51	\$9.82	\$7.59
Viking/ANR ML-7	\$4.82	\$5.58	\$6.83	\$6.64	\$6.55	\$7.19	\$7.10	\$7.29	\$7.76	\$7.97	\$8.58	\$8.95	\$9.27	\$9.51	\$9.82	\$7.59
Vector	\$4.74	\$5.52	\$6.71	\$6.49	\$6.39	\$7.03	\$6.93	\$7.11	\$7.58	\$7.78	\$8.40	\$8.76	\$9.08	\$9.32	\$9.63	\$7.43
Panhandle Field Zone	\$4.47	\$5.23	\$6.39	\$6.13	\$6.02	\$6.64	\$6.51	\$6.67	\$7.16	\$7.33	\$7.93	\$8.26	\$8.56	\$8.79	\$9.08	\$7.01
Trunkline/Panhandle	\$4.47	\$5.23	\$6.39	\$6.13	\$6.02	\$6.64	\$6.51	\$6.67	\$7.16	\$7.33	\$7.93	\$8.26	\$8.56	\$8.79	\$9.08	\$7.01
ANR Alliance	\$4.74	\$5.52	\$6.71	\$6.49	\$6.39	\$7.03	\$6.93	\$7.11	\$7.58	\$7.78	\$8.40	\$8.76	\$9.08	\$9.32	\$9.63	\$7.43
ANR SW	\$4.44	\$5.20	\$6.35	\$6.08	\$5.98	\$6.59	\$6.46	\$6.62	\$7.10	\$7.27	\$7.87	\$8.20	\$8.50	\$8.72	\$9.01	\$6.96
ANR SE	\$4.60	\$5.39	\$6.57	\$6.32	\$6.21	\$6.84	\$6.71	\$6.88	\$7.38	\$7.56	\$8.18	\$8.54	\$8.86	\$9.10	\$9.41	\$7.24
Nexus	\$4.15	\$5.00	\$5.97	\$5.54	\$5.20	\$5.54	\$5.18	\$5.19	\$5.58	\$5.66	\$6.44	\$6.90	\$7.23	\$7.56	\$7.91	\$5.94

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
No Capacity Expansion Scenario																
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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	58,787,100
Panhandle Field Zone	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	168,893,820
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	174,211,200
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	654,096,810
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	318,967	339,041	407,936	410,292	389,625	419,229	428,351	428,861	451,926	466,813	485,371	513,678	518,364	536,103	552,266	6,666,825
Viking/ANR ML-7	246,503	252,032	261,330	260,038	259,284	263,968	263,442	264,775	268,254	269,832	274,299	277,149	279,421	281,226	283,532	4,005,085
Vector	1,191,140	1,387,709	1,695,724	1,634,158	1,621,194	1,783,010	1,742,637	1,798,648	1,918,336	1,954,685	2,117,957	2,208,495	2,300,657	2,336,031	2,428,710	28,119,091
Panhandle Field Zone	8,963,218	10,232,247	12,176,897	11,823,453	11,667,837	12,697,795	12,534,859	12,834,735	13,609,712	13,925,645	14,944,013	15,535,128	16,058,965	16,452,280	16,960,806	200,417,587
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	888,975	1,008,763	1,198,307	1,157,021	1,136,051	1,236,634	1,215,066	1,240,488	1,320,272	1,346,143	1,442,355	1,499,217	1,547,900	1,580,643	1,631,319	19,449,152
ANR SW	7,329,548	8,418,339	10,086,792	9,783,547	9,650,033	10,533,707	10,393,913	10,651,198	11,316,105	11,587,167	12,460,897	12,968,056	13,417,494	13,754,947	14,191,247	166,542,990
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	18,938,351	21,638,131	25,826,985	25,068,509	24,724,026	26,934,342	26,578,268	27,218,704	28,884,605	29,550,284	31,724,892	33,001,723	34,122,801	34,941,230	36,047,880	425,200,731
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	77,327,524	96,670,884	113,689,565	104,822,770	110,012,186	121,117,903	113,182,011	120,190,599	127,833,451	127,857,857	142,845,990	145,073,802	155,621,424	155,352,352	162,234,929	1,873,833,247
Great Lakes	30,949,456	33,529,241	42,847,577	43,278,828	40,536,072	44,540,960	45,746,787	45,823,104	48,997,249	51,045,435	53,552,822	57,396,731	57,924,059	60,160,970	62,093,883	718,423,172
Viking/ANR ML-7	35,722,433	41,251,126	50,549,267	49,256,950	48,503,488	53,186,897	52,660,954	53,993,763	57,472,859	59,050,947	63,518,224	66,367,638	68,640,217	70,445,371	72,751,089	843,371,223
Vector	68,136,434	79,902,151	97,239,801	93,225,139	92,327,530	101,845,129	99,252,568	102,451,051	109,592,887	111,556,689	121,303,047	126,484,349	131,932,477	134,077,885	139,544,780	1,608,871,917
Panhandle Field Zone	122,404,447	143,339,588	174,917,962	167,831,952	164,865,628	181,721,033	178,086,088	182,588,944	195,869,860	200,499,981	217,006,031	226,141,122	234,521,214	240,628,813	248,673,111	2,879,095,774
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	83,643,411	96,978,340	118,387,392	114,622,802	112,559,249	123,830,286	122,057,496	125,208,383	133,741,586	137,004,541	147,917,591	154,642,937	160,235,060	164,149,599	170,008,213	1,964,986,886
ANR SW	168,475,103	197,412,133	240,812,683	230,908,208	226,918,977	250,102,937	244,999,574	251,270,283	269,534,048	275,859,056	298,645,585	311,111,843	322,692,590	331,042,933	342,122,235	3,961,908,189
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	586,658,808	689,083,463	838,444,246	803,946,649	795,723,129	876,345,145	855,985,480	881,526,127	943,041,941	962,874,506	1,044,789,290	1,087,218,421	1,131,567,040	1,155,857,922	1,197,428,240	13,850,490,409

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Total Gas Supply Portfolio Costs (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	77,327,524	96,670,884	113,689,565	104,822,770	110,012,186	121,117,903	113,182,011	120,190,599	127,833,451	127,857,857	142,845,990	145,073,802	155,621,424	155,352,352	162,234,929	1,873,833,247
Great Lakes	39,832,319	42,432,178	51,819,408	52,253,016	49,489,593	53,524,085	54,739,034	54,815,861	58,013,071	60,076,144	62,602,089	66,474,305	67,006,320	69,260,969	71,210,045	853,548,437
Viking/ANR ML-7	38,191,372	43,725,594	53,033,033	51,739,424	50,985,208	55,673,301	55,146,832	56,480,974	59,963,549	61,543,215	66,014,959	68,867,222	71,142,074	72,949,033	75,257,057	880,712,848
Vector	73,246,714	85,208,999	102,854,664	98,778,437	97,867,864	107,547,279	104,914,346	108,168,839	115,430,364	117,430,513	127,340,144	132,611,983	138,152,274	140,333,056	145,892,630	1,695,778,108
Panhandle Field Zone	142,627,252	164,831,424	198,354,447	190,914,993	187,793,053	205,678,416	201,880,535	206,683,267	220,739,159	225,685,214	243,209,632	252,935,838	261,839,767	268,340,681	276,893,505	3,248,407,181
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	86,029,986	99,484,703	121,083,299	117,277,423	115,192,900	126,564,519	124,770,162	127,946,471	136,559,458	139,848,283	150,857,546	157,639,754	163,280,560	167,227,842	173,137,132	2,006,900,039
ANR SW	187,418,731	217,444,552	262,513,555	252,305,836	248,183,091	272,250,724	267,007,567	273,535,561	292,464,234	299,060,303	322,720,562	335,693,979	347,724,164	356,411,960	367,927,562	4,302,662,380
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	649,203,612	754,328,049	907,877,686	872,621,612	864,053,609	946,885,941	926,170,202	952,351,285	#####	#####	1,120,120,636	1,163,826,598	1,209,296,295	1,234,405,606	1,235,720,376	14,929,787,949
Delivered Gas Price (\$/Dth)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.84	\$5.61	\$6.86	\$6.66	\$6.57	\$7.21	\$7.13	\$7.31	\$7.78	\$7.98	\$8.60	\$8.97	\$9.30	\$9.56	\$9.89	\$7.62
Great Lakes	\$6.94	\$7.70	\$8.96	\$8.78	\$8.69	\$9.33	\$9.24	\$9.43	\$9.90	\$10.11	\$10.73	\$11.11	\$11.42	\$11.66	\$11.98	\$9.73
Viking/ANR ML-7	\$5.15	\$5.91	\$7.16	\$6.98	\$6.89	\$7.52	\$7.44	\$7.63	\$8.09	\$8.30	\$8.91	\$9.29	\$9.61	\$9.85	\$10.16	\$7.93
Vector	\$5.08	\$5.81	\$7.10	\$6.88	\$6.72	\$7.39	\$7.29	\$7.46	\$7.97	\$8.15	\$8.77	\$9.19	\$9.51	\$9.71	\$10.08	\$7.81
Panhandle Field Zone	\$5.21	\$6.02	\$7.25	\$6.98	\$6.86	\$7.51	\$7.38	\$7.55	\$8.06	\$8.25	\$8.88	\$9.24	\$9.56	\$9.80	\$10.11	\$7.91
Trunkline/Panhandle																
ANR Alliance	\$4.88	\$5.66	\$6.86	\$6.65	\$6.55	\$7.18	\$7.08	\$7.27	\$7.74	\$7.94	\$8.57	\$8.93	\$9.25	\$9.50	\$9.81	\$7.59
ANR SW	\$4.94	\$5.73	\$6.92	\$6.65	\$6.54	\$7.17	\$7.04	\$7.21	\$7.71	\$7.88	\$8.50	\$8.84	\$9.16	\$9.39	\$9.69	\$7.56
ANR SE																
Nexus																
Average Delivered Gas Price	\$5.11	\$5.90	\$7.12	\$6.88	\$6.77	\$7.41	\$7.30	\$7.48	\$7.97	\$8.16	\$8.78	\$9.14	\$9.46	\$9.70	\$10.01	\$7.81
Total Cost By Category (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$654,096,810
Pipeline Fuel and Usage Costs	\$18,938,351	\$21,638,131	\$25,826,985	\$25,068,509	\$24,724,026	\$26,934,342	\$26,578,268	\$27,218,704	\$28,884,605	\$29,550,284	\$31,724,892	\$33,001,723	\$34,122,801	\$34,941,230	\$36,047,880	\$425,200,731
Commodity Purchase Costs	\$586,658,808	\$689,083,463	\$838,444,246	\$803,946,649	\$795,723,129	\$876,345,145	\$855,985,480	\$881,526,127	\$943,041,941	\$962,874,506	\$1,044,789,290	\$1,087,218,421	\$1,131,567,040	\$1,155,857,922	\$1,197,428,240	\$13,850,490,409
Total Costs	\$649,203,612	\$754,328,049	\$907,877,686	\$872,621,612	\$864,053,609	\$946,885,941	\$926,170,202	\$952,351,285	\$1,015,533,000	\$1,036,031,244	\$1,120,120,636	\$1,163,826,598	\$1,209,296,295	\$1,234,405,606	\$1,277,082,574	\$14,929,787,949

C.2 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 1.5 Bcfd Capacity Expansion Scenario

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Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390
Source of Supply/ Transportation Utilization (Dth/Day)																
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000

Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%

Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.77	\$5.57	\$6.75	\$6.49	\$6.32	\$6.88	\$6.78	\$7.01	\$7.47	\$7.72	\$8.24	\$8.70	\$9.04	\$9.24	\$9.55	\$7.37
Great Lakes	\$4.76	\$5.54	\$6.72	\$6.47	\$6.31	\$6.87	\$6.78	\$7.01	\$7.47	\$7.73	\$8.23	\$8.70	\$9.04	\$9.24	\$9.54	\$7.36
Viking/ANR ML-7	\$4.76	\$5.54	\$6.72	\$6.47	\$6.31	\$6.87	\$6.78	\$7.01	\$7.47	\$7.73	\$8.23	\$8.70	\$9.04	\$9.24	\$9.54	\$7.36
Vector	\$4.70	\$5.50	\$6.65	\$6.38	\$6.21	\$6.76	\$6.66	\$6.88	\$7.33	\$7.58	\$8.09	\$8.55	\$8.88	\$9.08	\$9.38	\$7.24
Panhandle Field Zone	\$4.46	\$5.26	\$6.38	\$6.08	\$5.90	\$6.44	\$6.32	\$6.54	\$6.98	\$7.21	\$7.70	\$8.13	\$8.45	\$8.63	\$8.92	\$6.89
Trunkline/Panhandle	\$4.46	\$5.26	\$6.38	\$6.08	\$5.90	\$6.44	\$6.32	\$6.54	\$6.98	\$7.21	\$7.70	\$8.13	\$8.45	\$8.63	\$8.92	\$6.89
ANR Alliance	\$4.70	\$5.50	\$6.65	\$6.38	\$6.21	\$6.76	\$6.66	\$6.88	\$7.33	\$7.58	\$8.09	\$8.55	\$8.88	\$9.08	\$9.38	\$7.24
ANR SW	\$4.42	\$5.23	\$6.33	\$6.03	\$5.86	\$6.39	\$6.27	\$6.50	\$6.93	\$7.16	\$7.64	\$8.07	\$8.38	\$8.56	\$8.85	\$6.84
ANR SE	\$4.59	\$5.43	\$6.58	\$6.29	\$6.11	\$6.66	\$6.54	\$6.77	\$7.23	\$7.47	\$7.98	\$8.43	\$8.77	\$8.97	\$9.27	\$7.14
Nexus	\$4.22	\$5.10	\$6.12	\$5.71	\$5.45	\$5.93	\$5.75	\$5.69	\$6.01	\$5.98	\$6.61	\$7.11	\$7.49	\$7.82	\$8.12	\$6.21

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	58,787,100
Panhandle Field Zone	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	168,893,820
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	174,211,200
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	654,096,810
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	317,118	334,887	405,502	399,715	379,899	400,089	414,205	410,830	440,131	450,905	472,485	494,024	509,848	518,128	537,047	6,484,813
Viking/ANR ML-7	246,061	251,748	260,579	258,769	257,535	261,622	261,092	262,708	266,114	268,029	271,788	275,206	277,757	279,203	281,488	3,979,698
Vector	1,174,558	1,381,881	1,670,435	1,596,273	1,559,321	1,708,747	1,658,320	1,735,178	1,841,328	1,901,448	2,035,248	2,151,609	2,243,538	2,272,487	2,361,940	27,292,311
Panhandle Field Zone	8,890,570	10,202,834	12,075,751	11,633,125	11,362,499	12,264,500	12,090,864	12,468,583	13,203,482	13,608,602	14,442,382	15,185,164	15,740,481	16,056,688	16,548,412	195,773,938
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	886,419	1,013,237	1,196,831	1,147,900	1,117,270	1,203,915	1,183,834	1,220,464	1,292,034	1,328,274	1,407,082	1,477,688	1,530,010	1,555,072	1,605,529	19,165,558
ANR SW	7,267,219	8,393,103	10,000,012	9,620,252	9,388,062	10,161,953	10,012,978	10,337,050	10,967,572	11,315,154	12,030,512	12,667,798	13,144,244	13,415,540	13,837,425	162,558,874
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	18,781,945	21,577,691	25,609,109	24,656,034	24,064,586	26,000,826	25,621,293	26,434,812	28,010,660	28,872,412	30,659,497	32,251,490	33,445,877	34,097,118	35,171,843	415,255,192
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,544,984	97,061,966	111,061,324	103,109,588	104,807,041	117,298,267	106,310,466	117,183,909	121,365,935	125,573,294	135,640,738	143,530,708	150,119,183	151,807,117	156,793,593	1,817,208,111
Great Lakes	30,795,546	33,025,445	42,554,993	41,893,377	39,330,524	42,092,815	44,060,693	43,627,513	47,572,970	49,092,211	52,005,389	54,926,657	57,085,653	58,189,510	60,705,809	696,959,105
Viking/ANR ML-7	35,279,854	40,967,137	49,797,690	47,987,911	46,753,821	50,840,891	50,310,600	51,926,752	55,332,927	57,248,341	61,007,286	64,424,735	66,976,544	68,421,927	70,707,251	817,983,669
Vector	67,469,197	79,838,249	96,403,883	91,765,238	89,437,760	98,177,065	94,993,252	99,488,339	105,728,097	109,103,824	116,987,245	123,760,545	129,102,722	130,785,353	136,023,266	1,569,064,033
Panhandle Field Zone	121,963,647	144,118,842	174,530,526	166,313,188	161,702,413	176,295,718	172,881,226	179,204,150	191,114,901	197,484,191	210,732,572	222,625,733	231,306,287	236,322,028	244,120,854	2,830,716,276
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,886,151	96,656,856	117,390,408	112,559,957	109,248,868	119,073,941	117,200,881	121,232,210	129,332,876	133,580,763	142,684,329	150,776,793	156,917,565	159,856,659	165,662,014	1,915,060,268
ANR SW	167,863,249	198,499,705	240,263,400	228,821,823	222,546,790	242,653,584	237,839,845	246,650,689	262,976,962	271,726,117	289,976,573	306,316,982	318,238,775	325,127,088	335,843,696	3,895,345,280
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	581,802,629	690,168,200	832,002,224	792,451,082	773,827,217	846,432,280	823,596,963	859,313,563	913,424,669	943,808,742	1,009,034,130	1,066,362,152	1,109,746,728	1,130,509,680	1,169,856,484	13,542,336,742

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Total Gas Supply Portfolio Costs																
(\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,544,984	97,061,966	111,061,324	103,109,588	104,807,041	117,298,267	106,310,466	117,183,909	121,365,935	125,573,294	135,640,738	143,530,708	150,119,183	151,807,117	156,793,593	1,817,208,111
Great Lakes	39,676,560	41,924,228	51,524,391	50,856,988	48,274,319	51,056,800	53,038,794	52,602,239	56,576,997	58,107,012	61,041,770	63,984,576	66,159,397	67,271,534	69,806,752	831,902,358
Viking/ANR ML-7	37,748,351	43,441,321	52,280,704	50,469,116	49,233,792	53,324,948	52,794,128	54,411,896	57,821,477	59,738,807	63,501,510	66,922,377	69,476,737	70,923,566	73,211,175	855,299,906
Vector	72,562,895	85,139,270	101,993,457	97,280,652	94,916,221	103,804,951	100,570,712	105,142,657	111,488,565	114,924,412	122,941,632	129,831,294	135,265,399	136,976,980	142,304,347	1,655,143,444
Panhandle Field Zone	142,113,805	165,581,264	197,865,865	189,205,902	184,324,499	199,819,806	196,231,678	202,932,321	215,577,971	222,352,382	236,434,542	249,070,485	258,306,356	263,638,303	271,928,855	3,195,384,034
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	85,270,170	99,167,693	120,084,839	115,205,456	111,863,738	121,775,455	119,882,315	123,950,274	132,122,509	136,406,637	145,589,010	153,752,081	159,945,174	162,909,331	168,765,143	1,956,689,827
ANR SW	186,744,548	218,506,888	261,877,492	250,056,154	243,548,932	264,429,617	259,466,903	268,601,819	285,558,614	294,655,351	313,621,166	330,598,860	342,997,099	350,156,708	361,295,201	4,232,115,353
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	644,191,027	755,352,345	901,217,787	860,713,569	841,498,256	916,039,560	892,824,710	929,354,828	985,041,783	#####	1,083,300,082	1,142,220,096	1,186,799,060	1,208,213,252	1,212,175,816	14,611,688,744
Delivered Gas Price (\$/Dth)																
MichCon Citygate	\$4.77	\$5.57	\$6.75	\$6.49	\$6.32	\$6.88	\$6.78	\$7.01	\$7.47	\$7.72	\$8.24	\$8.70	\$9.04	\$9.24	\$9.55	\$7.37
Great Lakes	\$6.88	\$7.67	\$8.86	\$8.60	\$8.44	\$9.01	\$8.92	\$9.15	\$9.61	\$9.87	\$10.38	\$10.85	\$11.19	\$11.39	\$11.70	\$9.50
Viking/ANR ML-7	\$5.09	\$5.87	\$7.06	\$6.81	\$6.65	\$7.21	\$7.12	\$7.35	\$7.80	\$8.06	\$8.57	\$9.03	\$9.38	\$9.57	\$9.88	\$7.70
Vector	\$5.04	\$5.79	\$7.05	\$6.76	\$6.53	\$7.11	\$7.00	\$7.23	\$7.71	\$7.95	\$8.48	\$8.96	\$9.33	\$9.45	\$9.84	\$7.62
Panhandle Field Zone	\$5.19	\$6.05	\$7.23	\$6.91	\$6.73	\$7.30	\$7.17	\$7.41	\$7.88	\$8.12	\$8.64	\$9.10	\$9.44	\$9.63	\$9.93	\$7.78
Trunkline/Panhandle																
ANR Alliance	\$4.84	\$5.64	\$6.80	\$6.53	\$6.36	\$6.92	\$6.81	\$7.04	\$7.49	\$7.74	\$8.26	\$8.72	\$9.06	\$9.25	\$9.55	\$7.40
ANR SW	\$4.92	\$5.75	\$6.90	\$6.59	\$6.41	\$6.97	\$6.84	\$7.07	\$7.52	\$7.76	\$8.26	\$8.71	\$9.04	\$9.22	\$9.52	\$7.43
ANR SE																
Nexus																
Average Delivered Gas Price	\$5.08	\$5.90	\$7.07	\$6.78	\$6.61	\$7.17	\$7.05	\$7.29	\$7.74	\$7.99	\$8.50	\$8.96	\$9.30	\$9.49	\$9.79	\$7.65
Total Cost By Category (\$)																
Pipeline Capacity Costs	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$654,096,810
Pipeline Fuel and Usage Costs	\$18,781,945	\$21,577,691	\$25,609,109	\$24,656,034	\$24,064,586	\$26,000,826	\$25,621,293	\$26,434,812	\$28,010,660	\$28,872,412	\$30,659,497	\$32,251,490	\$33,445,877	\$34,097,118	\$35,171,843	\$415,255,192
Commodity Purchase Costs	\$581,802,629	\$690,168,200	\$832,002,224	\$792,451,082	\$773,827,217	\$846,432,280	\$823,596,963	\$859,313,563	\$913,424,669	\$943,808,742	\$1,009,034,130	\$1,066,362,152	\$1,109,746,728	\$1,130,509,680	\$1,169,856,484	\$13,542,336,742
Total Costs	\$644,191,027	\$755,352,345	\$901,217,787	\$860,713,569	\$841,498,256	\$916,039,560	\$892,824,710	\$929,354,828	\$985,041,783	\$1,016,287,608	\$1,083,300,082	\$1,142,220,096	\$1,186,799,060	\$1,208,213,252	\$1,248,634,781	\$14,611,688,744

C.3 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 1.5 Bcfd Capacity Expansion Scenario

Michigan Public Service Commission																
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Projected Transportation Utilization, Reservation Costs, and Usage Costs With NEXUS Capacity																
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Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390

Source of Supply/ Transportation Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Commodity Purchase Price (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.77	\$5.57	\$6.75	\$6.49	\$6.32	\$6.88	\$6.78	\$7.01	\$7.47	\$7.72	\$8.24	\$8.70	\$9.04	\$9.24	\$9.55	\$7.37
Great Lakes	\$4.76	\$5.54	\$6.72	\$6.47	\$6.31	\$6.87	\$6.78	\$7.01	\$7.47	\$7.73	\$8.23	\$8.70	\$9.04	\$9.24	\$9.54	\$7.36
Viking/ANR ML-7	\$4.76	\$5.54	\$6.72	\$6.47	\$6.31	\$6.87	\$6.78	\$7.01	\$7.47	\$7.73	\$8.23	\$8.70	\$9.04	\$9.24	\$9.54	\$7.36
Vector	\$4.70	\$5.50	\$6.65	\$6.38	\$6.21	\$6.76	\$6.66	\$6.88	\$7.33	\$7.58	\$8.09	\$8.55	\$8.88	\$9.08	\$9.38	\$7.24
Panhandle Field Zone	\$4.46	\$5.26	\$6.38	\$6.08	\$5.90	\$6.44	\$6.32	\$6.54	\$6.98	\$7.21	\$7.70	\$8.13	\$8.45	\$8.63	\$8.92	\$6.89
Trunkline/Panhandle	\$4.46	\$5.26	\$6.38	\$6.08	\$5.90	\$6.44	\$6.32	\$6.54	\$6.98	\$7.21	\$7.70	\$8.13	\$8.45	\$8.63	\$8.92	\$6.89
ANR Alliance	\$4.70	\$5.50	\$6.65	\$6.38	\$6.21	\$6.76	\$6.66	\$6.88	\$7.33	\$7.58	\$8.09	\$8.55	\$8.88	\$9.08	\$9.38	\$7.24
ANR SW	\$4.42	\$5.23	\$6.33	\$6.03	\$5.86	\$6.39	\$6.27	\$6.50	\$6.93	\$7.16	\$7.64	\$8.07	\$8.38	\$8.56	\$8.85	\$6.84
ANR SE	\$4.59	\$5.43	\$6.58	\$6.29	\$6.11	\$6.66	\$6.54	\$6.77	\$7.23	\$7.47	\$7.98	\$8.43	\$8.77	\$8.97	\$9.27	\$7.14
Nexus	\$4.22	\$5.10	\$6.12	\$5.71	\$5.45	\$5.93	\$5.75	\$5.69	\$6.01	\$5.98	\$6.61	\$7.11	\$7.49	\$7.82	\$8.12	\$6.21

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	123,855,468
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	165,835,662
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	285,384,375
Total Pipeline Capacity Cost	55,152,013	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	827,252,983
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	317,118	334,887	405,502	399,715	379,899	400,089	414,205	410,830	440,131	450,905	472,485	494,024	509,848	518,128	537,047	6,484,813
Viking/ANR ML-7	246,061	251,748	260,579	258,769	257,535	261,622	261,092	262,708	266,114	268,029	271,788	275,206	277,757	279,203	281,488	3,979,698
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	5,259,687	6,086,841	7,202,327	6,895,427	6,738,202	7,320,946	7,118,978	7,412,966	7,835,097	8,063,973	8,590,987	9,045,549	9,402,033	9,523,734	9,869,743	116,366,490
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	886,419	1,013,237	1,196,831	1,147,900	1,117,270	1,203,915	1,183,834	1,220,464	1,292,034	1,328,274	1,407,082	1,477,688	1,530,010	1,555,072	1,605,529	19,165,558
ANR SW	6,917,833	7,989,589	9,519,242	9,157,739	8,936,713	9,673,398	9,531,585	9,840,076	10,440,285	10,771,156	11,452,122	12,058,769	12,512,309	12,770,562	13,172,165	154,743,543
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	1,534,477	1,814,041	2,197,047	2,099,778	2,040,749	2,224,118	2,184,559	2,261,764	2,413,614	2,494,119	2,664,731	2,816,986	2,928,425	2,994,639	3,095,639	35,764,687
Total Pipeline Usage Costs	15,161,595	17,490,342	20,781,528	19,959,329	19,470,368	21,084,087	20,694,253	21,408,808	22,687,274	23,376,456	24,859,196	26,168,223	27,160,382	27,641,338	28,561,612	336,504,790
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,544,984	97,061,966	111,061,324	103,109,588	104,807,041	117,298,267	106,310,466	117,183,909	121,365,935	125,573,294	135,640,738	143,530,708	150,119,183	151,807,117	156,793,593	1,817,208,111
Great Lakes	30,795,546	33,025,445	42,554,993	41,893,377	39,330,524	42,092,815	44,060,693	43,627,513	47,572,970	49,092,211	52,005,389	54,926,657	57,085,653	58,189,510	60,705,809	696,959,105
Viking/ANR ML-7	35,279,854	40,967,137	49,797,690	47,987,911	46,753,821	50,840,891	50,310,600	51,926,752	55,332,927	57,248,341	61,007,286	64,424,735	66,976,544	68,421,927	70,707,251	817,983,669
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	72,290,460	86,218,602	104,400,894	98,780,324	96,115,979	105,576,506	101,910,877	106,833,765	113,652,305	117,238,590	125,638,831	132,919,117	138,522,468	140,380,338	145,942,186	1,686,421,243
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,886,151	96,656,856	117,390,408	112,559,957	109,248,868	119,073,941	117,200,881	121,232,210	129,332,876	133,580,763	142,684,329	150,776,793	156,917,565	159,856,659	165,662,014	1,915,060,268
ANR SW	159,792,901	188,956,450	228,712,275	217,820,774	211,847,425	230,987,546	226,405,237	234,792,483	250,333,839	258,662,362	276,035,392	291,590,204	302,938,834	309,495,978	319,697,364	3,708,069,064
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	115,549,324	139,593,081	167,545,645	156,170,798	149,227,234	162,253,189	157,349,549	155,864,882	164,525,993	163,706,855	181,083,476	194,668,361	205,234,602	214,108,443	222,318,251	2,549,199,684
Total Commodity Cost	572,139,220	682,479,538	821,463,230	778,322,728	757,330,893	828,123,155	803,548,303	831,461,514	882,116,845	905,102,415	974,095,439	1,032,836,575	1,077,794,849	1,102,259,970	1,141,826,469	13,190,901,144

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Total Gas Supply Portfolio Costs																
(\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,544,984	97,061,966	111,061,324	103,109,588	104,807,041	117,298,267	106,310,466	117,183,909	121,365,935	125,573,294	135,640,738	143,530,708	150,119,183	151,807,117	156,793,593	1,817,208,111
Great Lakes	39,676,560	41,924,228	51,524,391	50,856,988	48,274,319	51,056,800	53,038,794	52,602,239	56,576,997	58,107,012	61,041,770	63,984,576	66,159,397	67,271,534	69,806,752	831,902,358
Viking/ANR ML-7	37,748,351	43,441,321	52,280,704	50,469,116	49,233,792	53,324,948	52,794,128	54,411,896	57,821,477	59,738,807	63,501,510	66,922,377	69,476,737	70,923,566	73,211,175	855,299,906
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	85,807,178	100,562,474	119,860,252	113,932,782	111,111,213	121,154,483	117,286,886	122,503,762	129,744,433	133,559,594	142,486,849	150,221,697	156,181,532	158,161,104	164,068,961	1,926,643,201
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	85,270,170	99,167,693	120,084,839	115,205,456	111,863,738	121,775,455	119,882,315	123,950,274	132,122,509	136,406,637	145,589,010	153,752,081	159,945,174	162,909,331	168,765,143	1,956,689,827
ANR SW	177,766,445	208,001,749	249,287,228	238,034,224	231,839,849	251,716,655	246,992,533	255,688,270	271,829,835	280,489,229	298,543,225	314,704,684	326,506,854	333,322,251	343,925,240	4,028,648,269
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	136,109,426	160,432,747	188,768,318	177,296,202	170,293,608	183,502,932	178,559,732	177,152,271	185,965,232	185,226,599	202,773,832	216,510,973	227,188,653	236,128,706	244,439,515	2,870,348,746
Total Gas Supply Portfolio Cost	642,452,828	755,119,949	897,394,827	853,432,126	831,951,330	904,357,311	879,392,625	908,020,391	959,954,189	983,628,941	1,054,104,704	1,114,154,866	1,160,105,301	1,185,051,378	1,225,538,150	14,354,658,917
Delivered Gas Price (\$/Dth)																
MichCon Citygate	\$4.77	\$5.57	\$6.75	\$6.49	\$6.32	\$6.88	\$6.78	\$7.01	\$7.47	\$7.72	\$8.23	\$8.69	\$9.04	\$9.24	\$9.55	\$7.37
Great Lakes	\$6.88	\$7.67	\$8.86	\$8.61	\$8.45	\$9.01	\$8.92	\$9.15	\$9.61	\$9.87	\$10.38	\$10.85	\$11.20	\$11.39	\$11.70	\$9.50
Viking/ANR ML-7	\$5.09	\$5.88	\$7.05	\$6.80	\$6.65	\$7.20	\$7.11	\$7.35	\$7.80	\$8.06	\$8.57	\$9.03	\$9.37	\$9.57	\$9.88	\$7.69
Vector	\$4.62	\$5.31	\$6.46	\$6.20	\$5.99	\$6.52	\$6.42	\$6.63	\$7.07	\$7.29	\$7.78	\$8.21	\$8.55	\$8.66	\$9.02	\$6.98
Panhandle Field Zone	\$5.60	\$6.46	\$7.63	\$7.32	\$7.14	\$7.71	\$7.58	\$7.82	\$8.28	\$8.53	\$9.04	\$9.51	\$9.84	\$10.04	\$10.34	\$8.19
Trunkline/Panhandle																
ANR Alliance	\$4.84	\$5.64	\$6.80	\$6.53	\$6.36	\$6.91	\$6.81	\$7.04	\$7.49	\$7.74	\$8.26	\$8.71	\$9.06	\$9.25	\$9.55	\$7.40
ANR SW	\$4.92	\$5.76	\$6.90	\$6.59	\$6.42	\$6.97	\$6.84	\$7.08	\$7.52	\$7.76	\$8.26	\$8.71	\$9.04	\$9.22	\$9.52	\$7.43
ANR SE																
Nexus	\$4.97	\$5.86	\$6.90	\$6.48	\$6.22	\$6.70	\$6.52	\$6.47	\$6.79	\$6.77	\$7.41	\$7.91	\$8.30	\$8.63	\$8.93	\$6.99
Average Delivered Gas Price	\$5.06	\$5.90	\$7.04	\$6.72	\$6.53	\$7.07	\$6.94	\$7.11	\$7.54	\$7.73	\$8.26	\$8.73	\$9.08	\$9.30	\$9.61	\$7.51
Total Cost By Category (\$)																
Pipeline Capacity Costs	\$55,152,013	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$827,252,983
Pipeline Fuel and Usage Costs	\$15,161,595	\$17,490,342	\$20,781,528	\$19,959,329	\$19,470,368	\$21,084,087	\$20,694,253	\$21,408,808	\$22,687,274	\$23,376,456	\$24,859,196	\$26,168,223	\$27,160,382	\$27,641,338	\$28,561,612	\$336,504,790
Commodity Purchase Costs	\$572,139,220	\$682,479,538	\$821,463,230	\$778,322,728	\$757,330,893	\$828,123,155	\$803,548,303	\$831,461,514	\$882,116,845	\$905,102,415	\$974,095,439	\$1,032,836,575	\$1,077,794,849	\$1,102,259,970	\$1,141,826,469	\$13,190,901,144
Total Costs	\$642,452,828	\$755,119,949	\$897,394,827	\$853,432,126	\$831,951,330	\$904,357,311	\$879,392,625	\$908,020,391	\$959,954,189	\$983,628,941	\$1,054,104,704	\$1,114,154,866	\$1,160,105,301	\$1,185,051,378	\$1,225,538,150	\$14,354,658,917

C.4 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 2.0 Bcfd Capacity Expansion Scenario

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
2.0 Bcfd NEXUS Capacity Expansion Scenario																
Page 1 of 4																
Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390
Source of Supply/ Transportation Utilization (Dth/Day)																
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

Michigan Public Service Commission																	Case No.: U-17332
DTE Gas Company																	
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																	
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2.0 Bcfd NEXUS Capacity Expansion Scenario																	
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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000

Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%

Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.75	\$5.55	\$6.72	\$6.47	\$6.30	\$6.80	\$6.72	\$6.87	\$7.41	\$7.63	\$8.18	\$8.67	\$9.02	\$9.04	\$9.59	\$7.31
Great Lakes	\$4.75	\$5.53	\$6.69	\$6.45	\$6.29	\$6.79	\$6.73	\$6.88	\$7.41	\$7.64	\$8.18	\$8.68	\$9.03	\$9.05	\$9.59	\$7.31
Viking/ANR ML-7	\$4.75	\$5.53	\$6.69	\$6.45	\$6.29	\$6.79	\$6.73	\$6.88	\$7.41	\$7.64	\$8.18	\$8.68	\$9.03	\$9.05	\$9.59	\$7.31
Vector	\$4.69	\$5.49	\$6.62	\$6.37	\$6.20	\$6.69	\$6.61	\$6.76	\$7.29	\$7.50	\$8.05	\$8.53	\$8.88	\$8.88	\$9.44	\$7.20
Panhandle Field Zone	\$4.46	\$5.26	\$6.37	\$6.08	\$5.91	\$6.39	\$6.29	\$6.45	\$6.96	\$7.15	\$7.69	\$8.13	\$8.47	\$8.45	\$9.01	\$6.87
Trunkline/Panhandle	\$4.46	\$5.26	\$6.37	\$6.08	\$5.91	\$6.39	\$6.29	\$6.45	\$6.96	\$7.15	\$7.69	\$8.13	\$8.47	\$8.45	\$9.01	\$6.87
ANR Alliance	\$4.69	\$5.49	\$6.62	\$6.37	\$6.20	\$6.69	\$6.61	\$6.76	\$7.29	\$7.50	\$8.05	\$8.53	\$8.88	\$8.88	\$9.44	\$7.20
ANR SW	\$4.42	\$5.22	\$6.32	\$6.03	\$5.87	\$6.34	\$6.24	\$6.40	\$6.91	\$7.09	\$7.63	\$8.07	\$8.40	\$8.39	\$8.95	\$6.82
ANR SE	\$4.60	\$5.43	\$6.57	\$6.30	\$6.12	\$6.61	\$6.52	\$6.67	\$7.20	\$7.41	\$7.95	\$8.44	\$8.78	\$8.79	\$9.36	\$7.12
Nexus	\$4.24	\$5.11	\$6.14	\$5.77	\$5.52	\$5.98	\$5.85	\$5.87	\$6.11	\$6.23	\$6.68	\$7.30	\$7.50	\$7.77	\$8.31	\$6.29

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
2.0 Bcfd NEXUS Capacity Expansion Scenario																
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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	58,787,100
Panhandle Field Zone	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	168,893,820
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	174,211,200
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	654,096,810
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	316,383	334,013	404,465	396,994	379,435	396,361	410,177	405,496	431,884	451,751	463,891	496,922	504,240	521,490	522,759	6,436,263
Viking/ANR ML-7	245,982	251,644	260,379	258,619	257,406	261,058	260,685	261,743	265,671	267,423	271,361	275,088	277,625	277,892	281,760	3,974,338
Vector	1,172,195	1,378,384	1,663,679	1,592,365	1,554,054	1,689,974	1,648,023	1,699,701	1,829,987	1,876,217	2,026,696	2,143,935	2,233,442	2,223,332	2,375,304	27,107,289
Panhandle Field Zone	8,876,081	10,184,840	12,040,013	11,618,015	11,343,860	12,149,375	12,013,264	12,262,594	13,125,888	13,476,128	14,373,039	15,161,570	15,729,374	15,737,429	16,656,433	194,747,903
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	886,654	1,012,796	1,195,126	1,148,351	1,118,225	1,195,494	1,180,010	1,204,315	1,288,051	1,318,757	1,404,742	1,478,330	1,530,127	1,529,730	1,616,364	19,107,071
ANR SW	7,254,788	8,377,665	9,969,349	9,607,288	9,372,070	10,063,179	9,946,399	10,160,317	10,900,999	11,201,494	11,971,018	12,647,555	13,134,714	13,141,625	13,930,104	161,678,566
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	18,752,084	21,539,342	25,533,012	24,621,632	24,025,051	25,755,442	25,458,558	25,994,166	27,842,480	28,591,771	30,510,747	32,203,401	33,409,523	33,431,498	35,382,725	413,051,430
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,340,133	96,831,673	110,325,729	103,487,883	104,104,604	115,895,064	106,010,242	114,031,546	122,386,713	121,729,355	137,176,274	141,395,196	150,698,748	143,632,927	163,423,566	1,806,469,652
Great Lakes	30,736,235	32,931,256	42,440,468	41,536,968	39,304,733	41,642,499	43,567,060	42,955,206	46,508,157	49,247,442	50,887,774	55,362,168	56,366,338	58,761,210	58,807,252	691,054,764
Viking/ANR ML-7	35,201,515	40,862,909	49,598,221	47,838,154	46,625,361	50,277,205	49,903,625	50,962,066	54,890,211	56,642,506	60,580,046	64,307,434	66,844,208	67,111,123	70,979,302	812,623,885
Vector	67,356,206	79,683,942	96,064,870	91,657,601	89,222,814	97,157,601	94,471,381	97,468,717	105,139,385	107,705,740	116,625,521	123,384,779	128,587,638	127,830,857	136,957,457	1,559,314,507
Panhandle Field Zone	121,996,024	144,047,271	174,239,003	166,480,653	161,876,230	174,861,157	172,194,772	176,502,187	190,652,830	195,717,943	210,486,912	222,634,452	231,837,302	231,400,722	246,868,867	2,821,796,325
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,734,021	96,460,584	117,009,482	112,341,221	109,046,360	117,834,954	116,386,145	118,974,726	128,350,560	132,243,773	141,834,216	150,595,676	156,472,827	156,807,479	166,246,617	1,903,338,641
ANR SW	167,907,338	198,401,342	239,861,736	229,060,248	222,777,809	240,675,308	236,900,220	242,920,949	262,373,007	269,266,783	289,683,345	306,308,055	319,004,868	318,296,167	339,764,571	3,883,201,745
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	581,271,472	689,218,975	829,539,508	792,402,728	772,957,911	838,343,788	819,433,444	843,815,396	910,300,864	932,553,542	1,007,274,088	1,063,987,758	1,109,811,927	1,103,840,484	1,183,047,631	13,477,799,517

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Total Gas Supply Portfolio Costs (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,340,133	96,831,673	110,325,729	103,487,883	104,104,604	115,895,064	106,010,242	114,031,546	122,386,713	121,729,355	137,176,274	141,395,196	150,698,748	143,632,927	163,423,566	1,806,469,652
Great Lakes	39,616,514	41,829,165	51,408,829	50,497,859	48,248,064	50,602,756	52,541,133	51,924,598	55,503,937	58,263,090	59,915,561	64,422,986	65,434,474	67,846,596	67,893,907	825,949,467
Viking/ANR ML-7	37,669,933	43,336,988	52,081,036	50,319,210	49,105,204	52,760,699	52,386,745	53,446,245	57,378,318	59,132,366	63,073,843	66,804,958	69,344,269	69,611,451	73,483,498	849,934,762
Vector	72,447,541	84,981,465	101,647,689	97,169,105	94,696,007	102,766,716	100,038,544	103,087,558	110,888,513	113,501,097	122,571,357	129,447,854	134,740,220	133,973,330	143,251,901	1,645,208,896
Panhandle Field Zone	142,131,693	165,491,699	197,538,604	189,358,256	184,479,678	198,270,121	195,467,624	200,024,369	215,038,306	220,453,658	236,119,539	249,055,610	258,826,264	258,397,738	274,784,888	3,185,438,048
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	85,118,275	98,970,980	119,702,208	114,987,172	111,662,186	120,528,048	119,063,755	121,676,640	131,136,211	135,060,131	144,736,558	153,571,605	159,500,553	159,834,808	169,360,581	1,944,909,712
ANR SW	186,776,206	218,393,087	261,445,165	250,281,615	243,763,959	262,352,567	258,460,699	264,695,346	284,888,086	292,082,357	313,268,443	330,569,690	343,753,662	343,051,872	365,308,755	4,219,091,510
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	643,630,009	754,364,771	898,678,974	860,630,814	840,589,416	907,705,685	888,498,456	913,416,016	981,749,798	#####	1,081,391,288	1,139,797,613	1,186,827,904	1,180,878,436	1,176,821,452	14,544,947,757
Delivered Gas Price (\$/Dth)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.75	\$5.55	\$6.72	\$6.47	\$6.30	\$6.80	\$6.72	\$6.87	\$7.41	\$7.63	\$8.18	\$8.67	\$9.02	\$9.04	\$9.59	\$7.31
Great Lakes	\$6.87	\$7.65	\$8.83	\$8.59	\$8.43	\$8.93	\$8.87	\$9.02	\$9.55	\$9.78	\$10.33	\$10.83	\$11.18	\$11.20	\$11.75	\$9.45
Viking/ANR ML-7	\$5.08	\$5.86	\$7.03	\$6.79	\$6.63	\$7.13	\$7.07	\$7.22	\$7.75	\$7.98	\$8.52	\$9.01	\$9.36	\$9.39	\$9.93	\$7.65
Vector	\$5.03	\$5.78	\$7.02	\$6.74	\$6.52	\$7.04	\$6.96	\$7.09	\$7.64	\$7.88	\$8.42	\$8.96	\$9.27	\$9.32	\$9.81	\$7.57
Panhandle Field Zone	\$5.19	\$6.04	\$7.22	\$6.92	\$6.74	\$7.24	\$7.14	\$7.31	\$7.86	\$8.05	\$8.62	\$9.10	\$9.45	\$9.44	\$10.03	\$7.76
Trunkline/Panhandle																
ANR Alliance	\$4.83	\$5.63	\$6.78	\$6.52	\$6.35	\$6.84	\$6.76	\$6.91	\$7.45	\$7.66	\$8.21	\$8.70	\$9.05	\$9.06	\$9.62	\$7.36
ANR SW	\$4.92	\$5.75	\$6.89	\$6.59	\$6.42	\$6.91	\$6.81	\$6.97	\$7.50	\$7.70	\$8.25	\$8.71	\$9.05	\$9.04	\$9.62	\$7.41
ANR SE																
Nexus																
Average Delivered Gas Price	\$5.08	\$5.90	\$7.05	\$6.78	\$6.61	\$7.10	\$7.01	\$7.17	\$7.71	\$7.92	\$8.47	\$8.95	\$9.30	\$9.30	\$9.88	\$7.61
Total Cost By Category (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$654,096,810
Pipeline Fuel and Usage Costs	\$18,752,084	\$21,539,342	\$25,533,012	\$24,621,632	\$24,025,051	\$25,755,442	\$25,458,558	\$25,994,166	\$27,842,480	\$28,591,771	\$30,510,747	\$32,203,401	\$33,409,523	\$33,431,498	\$35,382,725	\$413,051,430
Commodity Purchase Costs	\$581,271,472	\$689,218,975	\$829,539,508	\$792,402,728	\$772,957,911	\$838,343,788	\$819,433,444	\$843,815,396	\$910,300,864	\$932,553,542	\$1,007,274,088	\$1,063,987,758	\$1,109,811,927	\$1,103,840,484	\$1,183,047,631	\$13,477,799,517
Total Costs	\$643,630,009	\$754,364,771	\$898,678,974	\$860,630,814	\$840,589,416	\$907,705,685	\$888,498,456	\$913,416,016	\$981,749,798	\$1,004,751,767	\$1,081,391,288	\$1,139,797,613	\$1,186,827,904	\$1,180,878,436	\$1,262,036,810	\$14,544,947,757

C.5 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 2.0 Bcfd Capacity Expansion Scenario

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Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390
Source of Supply/ Transportation																
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Commodity Purchase Price (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.75	\$5.55	\$6.72	\$6.47	\$6.30	\$6.80	\$6.72	\$6.87	\$7.41	\$7.63	\$8.18	\$8.67	\$9.02	\$9.04	\$9.59	\$7.31
Great Lakes	\$4.75	\$5.53	\$6.69	\$6.45	\$6.29	\$6.79	\$6.73	\$6.88	\$7.41	\$7.64	\$8.18	\$8.68	\$9.03	\$9.05	\$9.59	\$7.31
Viking/ANR ML-7	\$4.75	\$5.53	\$6.69	\$6.45	\$6.29	\$6.79	\$6.73	\$6.88	\$7.41	\$7.64	\$8.18	\$8.68	\$9.03	\$9.05	\$9.59	\$7.31
Vector	\$4.69	\$5.49	\$6.62	\$6.37	\$6.20	\$6.69	\$6.61	\$6.76	\$7.29	\$7.50	\$8.05	\$8.53	\$8.88	\$8.88	\$9.44	\$7.20
Panhandle Field Zone	\$4.46	\$5.26	\$6.37	\$6.08	\$5.91	\$6.39	\$6.29	\$6.45	\$6.96	\$7.15	\$7.69	\$8.13	\$8.47	\$8.45	\$9.01	\$6.87
Trunkline/Panhandle	\$4.46	\$5.26	\$6.37	\$6.08	\$5.91	\$6.39	\$6.29	\$6.45	\$6.96	\$7.15	\$7.69	\$8.13	\$8.47	\$8.45	\$9.01	\$6.87
ANR Alliance	\$4.69	\$5.49	\$6.62	\$6.37	\$6.20	\$6.69	\$6.61	\$6.76	\$7.29	\$7.50	\$8.05	\$8.53	\$8.88	\$8.88	\$9.44	\$7.20
ANR SW	\$4.42	\$5.22	\$6.32	\$6.03	\$5.87	\$6.34	\$6.24	\$6.40	\$6.91	\$7.09	\$7.63	\$8.07	\$8.40	\$8.39	\$8.95	\$6.82
ANR SE	\$4.60	\$5.43	\$6.57	\$6.30	\$6.12	\$6.61	\$6.52	\$6.67	\$7.20	\$7.41	\$7.95	\$8.44	\$8.78	\$8.79	\$9.36	\$7.12
Nexus	\$4.24	\$5.11	\$6.14	\$5.77	\$5.52	\$5.98	\$5.85	\$5.87	\$6.11	\$6.23	\$6.68	\$7.30	\$7.50	\$7.77	\$8.31	\$6.29

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	123,855,468
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	165,835,662
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	285,384,375
Total Pipeline Capacity Cost	55,152,013	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	827,252,983
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	316,383	334,013	404,465	396,994	379,435	396,361	410,177	405,496	431,884	451,751	463,891	496,922	504,240	521,490	522,759	6,436,263
Viking/ANR ML-7	245,982	251,644	260,379	258,619	257,406	261,058	260,685	261,743	265,671	267,423	271,361	275,088	277,625	277,892	281,760	3,974,338
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	5,251,964	6,076,413	7,179,671	6,887,983	6,724,106	7,252,307	7,082,597	7,278,460	7,794,719	7,971,536	8,564,733	9,021,505	9,370,490	9,325,772	9,932,809	115,715,066
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	886,654	1,012,796	1,195,126	1,148,351	1,118,225	1,195,494	1,180,010	1,204,315	1,288,051	1,318,757	1,404,742	1,478,330	1,530,127	1,529,730	1,616,364	19,107,071
ANR SW	6,906,000	7,974,893	9,490,054	9,145,399	8,921,490	9,579,373	9,468,207	9,671,840	10,376,912	10,662,961	11,395,488	12,039,500	12,503,238	12,509,816	13,260,387	153,905,558
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	1,535,141	1,813,764	2,193,917	2,102,986	2,043,286	2,207,017	2,176,418	2,226,929	2,405,257	2,473,731	2,656,878	2,817,127	2,934,450	2,934,574	3,128,371	35,649,846
Total Pipeline Usage Costs	15,142,125	17,463,523	20,723,612	19,940,332	19,443,949	20,891,610	20,578,094	21,048,783	22,562,494	23,146,160	24,757,094	26,128,472	27,120,170	27,099,274	28,742,451	334,788,142
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,340,133	96,831,673	110,325,729	103,487,883	104,104,604	115,895,064	106,010,242	114,031,546	122,386,713	121,729,355	137,176,274	141,395,196	150,698,748	143,632,927	163,423,566	1,806,469,652
Great Lakes	30,736,235	32,931,256	42,440,468	41,536,968	39,304,733	41,642,499	43,567,060	42,955,206	46,508,157	49,247,442	50,887,774	55,362,168	56,366,338	58,761,210	58,807,252	691,054,764
Viking/ANR ML-7	35,201,515	40,862,909	49,598,221	47,838,154	46,625,361	50,277,205	49,903,625	50,962,066	54,890,211	56,642,506	60,580,046	64,307,434	66,844,208	67,111,123	70,979,302	812,623,885
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	72,307,898	86,166,295	104,178,505	98,887,134	96,136,597	104,692,489	101,644,601	105,008,557	113,466,439	115,939,315	125,727,404	132,714,859	138,388,128	137,297,553	147,517,342	1,680,073,116
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,734,021	96,460,584	117,009,482	112,341,221	109,046,360	117,834,954	116,386,145	118,974,726	128,350,560	132,243,773	141,834,216	150,595,676	156,472,827	156,807,479	166,246,617	1,903,338,641
ANR SW	159,834,870	188,862,816	228,329,922	218,047,736	212,067,338	229,104,380	225,510,786	231,242,057	249,758,920	256,321,264	275,756,261	291,581,706	303,668,095	302,993,466	323,429,736	3,696,509,353
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	116,041,857	139,988,104	168,055,781	157,967,514	151,183,943	163,624,193	160,186,145	160,665,785	167,249,626	170,471,933	182,934,139	199,787,259	205,494,174	212,674,060	227,649,513	2,583,974,026
Total Commodity Cost	572,196,529	682,103,636	819,938,107	780,106,611	758,468,936	823,070,783	803,208,604	823,839,943	882,610,626	902,595,589	974,896,115	1,035,744,296	1,077,932,516	1,079,277,818	1,158,053,326	13,174,043,436

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Total Gas Supply Portfolio Costs (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,340,133	96,831,673	110,325,729	103,487,883	104,104,604	115,895,064	106,010,242	114,031,546	122,386,713	121,729,355	137,176,274	141,395,196	150,698,748	143,632,927	163,423,566	1,806,469,652
Great Lakes	39,616,514	41,829,165	51,408,829	50,497,859	48,248,064	50,602,756	52,541,133	51,924,598	55,503,937	58,263,090	59,915,561	64,422,986	65,434,474	67,846,596	67,893,907	825,949,467
Viking/ANR ML-7	37,669,933	43,336,988	52,081,036	50,319,210	49,105,204	52,760,699	52,386,745	53,446,245	57,378,318	59,132,366	63,073,843	66,804,958	69,344,269	69,611,451	73,483,498	849,934,762
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	85,816,893	100,499,740	119,615,207	114,032,149	111,117,734	120,201,827	116,984,230	120,544,048	129,518,189	132,167,882	142,549,169	149,993,395	156,015,649	154,880,355	165,707,182	1,919,643,650
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	85,118,275	98,970,980	119,702,208	114,987,172	111,662,186	120,528,048	119,063,755	121,676,640	131,136,211	135,060,131	144,736,558	153,571,605	159,500,553	159,834,808	169,360,581	1,944,909,712
ANR SW	177,796,581	207,893,419	248,875,686	238,248,845	232,044,538	249,739,463	246,034,704	251,969,609	271,191,543	278,039,936	298,207,460	314,676,916	327,227,044	326,558,993	347,745,834	4,016,250,572
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	136,602,623	160,827,493	189,275,323	179,096,124	172,252,854	184,856,835	181,388,188	181,918,339	188,680,509	191,971,289	204,616,643	221,630,010	227,454,249	234,634,260	249,803,508	2,905,008,247
Total Gas Supply Portfolio Cost	642,490,667	754,717,228	895,811,788	855,197,012	833,062,955	899,112,462	878,936,768	900,038,795	960,323,190	980,891,819	1,054,803,278	1,117,022,837	1,160,202,756	1,161,527,160	1,241,945,847	14,336,084,561
Delivered Gas Price (\$/Dth)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.75	\$5.55	\$6.72	\$6.47	\$6.30	\$6.79	\$6.72	\$6.87	\$7.41	\$7.63	\$8.18	\$8.67	\$9.02	\$9.03	\$9.60	\$7.31
Great Lakes	\$6.87	\$7.66	\$8.83	\$8.59	\$8.43	\$8.93	\$8.87	\$9.02	\$9.55	\$9.78	\$10.33	\$10.83	\$11.18	\$11.20	\$11.75	\$9.46
Viking/ANR ML-7	\$5.08	\$5.86	\$7.03	\$6.78	\$6.63	\$7.13	\$7.06	\$7.22	\$7.74	\$7.97	\$8.52	\$9.01	\$9.36	\$9.38	\$9.93	\$7.65
Vector	\$4.61	\$5.30	\$6.44	\$6.18	\$5.97	\$6.45	\$6.38	\$6.50	\$7.01	\$7.22	\$7.72	\$8.21	\$8.50	\$8.54	\$8.99	\$6.94
Panhandle Field Zone	\$5.60	\$6.45	\$7.62	\$7.32	\$7.15	\$7.65	\$7.55	\$7.71	\$8.26	\$8.46	\$9.03	\$9.50	\$9.86	\$9.85	\$10.44	\$8.16
Trunkline/Panhandle																
ANR Alliance	\$4.83	\$5.63	\$6.78	\$6.52	\$6.35	\$6.84	\$6.76	\$6.91	\$7.45	\$7.66	\$8.21	\$8.70	\$9.05	\$9.05	\$9.62	\$7.36
ANR SW	\$4.92	\$5.75	\$6.89	\$6.59	\$6.42	\$6.91	\$6.81	\$6.97	\$7.50	\$7.69	\$8.25	\$8.71	\$9.06	\$9.04	\$9.62	\$7.41
ANR SE																
Nexus	\$4.99	\$5.87	\$6.91	\$6.54	\$6.29	\$6.75	\$6.63	\$6.65	\$6.89	\$7.01	\$7.47	\$8.10	\$8.31	\$8.57	\$9.13	\$7.07
Average Delivered Gas Price	\$5.06	\$5.90	\$7.03	\$6.73	\$6.54	\$7.03	\$6.93	\$7.06	\$7.53	\$7.72	\$8.26	\$8.76	\$9.09	\$9.14	\$9.71	\$7.50
Total Cost By Category (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$55,152,013	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$827,252,983
Pipeline Fuel and Usage Costs	\$15,142,125	\$17,463,523	\$20,723,612	\$19,940,332	\$19,443,949	\$20,891,610	\$20,578,094	\$21,048,783	\$22,562,494	\$23,146,160	\$24,757,094	\$26,128,472	\$27,120,170	\$27,099,274	\$28,742,451	\$334,788,142
Commodity Purchase Costs	\$572,196,529	\$682,103,636	\$819,938,107	\$780,106,611	\$758,468,936	\$823,070,783	\$803,208,604	\$823,839,943	\$882,610,626	\$902,595,589	\$974,896,115	\$1,035,744,296	\$1,077,932,516	\$1,079,277,818	\$1,158,053,326	\$13,174,043,436
Total Costs	\$642,490,667	\$754,717,228	\$895,811,788	\$855,197,012	\$833,062,955	\$899,112,462	\$878,936,768	\$900,038,795	\$960,323,190	\$980,891,819	\$1,054,803,278	\$1,117,022,837	\$1,160,202,756	\$1,161,527,160	\$1,241,945,847	\$14,336,084,561

C.6 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 3.25 Bcfd Capacity Expansion Scenario

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Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390
Source of Supply/ Transportation																
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.77	\$5.55	\$6.74	\$6.51	\$6.31	\$6.85	\$6.72	\$6.93	\$7.43	\$7.53	\$8.12	\$8.56	\$8.92	\$9.03	\$9.56	\$7.30
Great Lakes	\$4.76	\$5.52	\$6.71	\$6.48	\$6.30	\$6.84	\$6.72	\$6.92	\$7.42	\$7.53	\$8.12	\$8.56	\$8.91	\$9.03	\$9.55	\$7.29
Viking/ANR ML-7	\$4.76	\$5.52	\$6.71	\$6.48	\$6.30	\$6.84	\$6.72	\$6.92	\$7.42	\$7.53	\$8.12	\$8.56	\$8.91	\$9.03	\$9.55	\$7.29
Vector	\$4.70	\$5.47	\$6.62	\$6.37	\$6.18	\$6.71	\$6.57	\$6.78	\$7.27	\$7.36	\$7.96	\$8.38	\$8.74	\$8.84	\$9.36	\$7.15
Panhandle Field Zone	\$4.45	\$5.22	\$6.34	\$6.07	\$5.87	\$6.39	\$6.24	\$6.45	\$6.93	\$7.00	\$7.58	\$7.98	\$8.32	\$8.40	\$8.91	\$6.81
Trunkline/Panhandle	\$4.45	\$5.22	\$6.34	\$6.07	\$5.87	\$6.39	\$6.24	\$6.45	\$6.93	\$7.00	\$7.58	\$7.98	\$8.32	\$8.40	\$8.91	\$6.81
ANR Alliance	\$4.70	\$5.47	\$6.62	\$6.37	\$6.18	\$6.71	\$6.57	\$6.78	\$7.27	\$7.36	\$7.96	\$8.38	\$8.74	\$8.84	\$9.36	\$7.15
ANR SW	\$4.42	\$5.19	\$6.29	\$6.02	\$5.83	\$6.34	\$6.19	\$6.40	\$6.87	\$6.94	\$7.53	\$7.91	\$8.25	\$8.33	\$8.85	\$6.76
ANR SE	\$4.59	\$5.39	\$6.53	\$6.27	\$6.06	\$6.59	\$6.43	\$6.64	\$7.13	\$7.21	\$7.80	\$8.23	\$8.59	\$8.70	\$9.22	\$7.03
Nexus	\$4.25	\$5.09	\$6.15	\$5.83	\$5.60	\$6.13	\$6.00	\$6.16	\$6.52	\$6.51	\$7.09	\$7.50	\$7.83	\$7.98	\$8.53	\$6.48

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	58,787,100
Panhandle Field Zone	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	168,893,820
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	174,211,200
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	654,096,810
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	316,239	335,612	403,772	400,506	379,130	398,918	412,415	403,294	437,353	446,744	459,899	496,232	498,085	522,581	523,310	6,434,087
Viking/ANR ML-7	246,057	251,622	260,466	258,864	257,434	261,382	260,611	262,039	265,793	266,600	270,882	274,256	276,766	277,778	281,476	3,972,027
Vector	1,175,568	1,376,324	1,666,603	1,598,894	1,555,994	1,697,836	1,639,322	1,717,264	1,826,397	1,843,269	2,002,616	2,108,577	2,202,382	2,215,995	2,360,163	26,987,205
Panhandle Field Zone	8,888,580	10,160,583	12,032,474	11,631,011	11,317,147	12,185,716	11,949,703	12,297,398	13,093,046	13,244,046	14,222,482	14,917,983	15,500,500	15,672,871	16,530,307	193,643,848
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	885,464	1,007,342	1,190,069	1,146,244	1,111,695	1,195,537	1,170,752	1,205,300	1,282,071	1,292,989	1,385,926	1,453,096	1,505,064	1,520,409	1,599,859	18,951,818
ANR SW	7,265,512	8,356,853	9,962,882	9,618,438	9,349,152	10,094,358	9,891,866	10,190,178	10,872,821	11,002,375	11,841,844	12,438,565	12,938,347	13,086,236	13,821,892	160,731,319
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	18,777,419	21,488,336	25,516,266	24,653,955	23,970,553	25,833,746	25,324,670	26,075,474	27,777,481	28,096,023	30,183,649	31,688,710	32,921,144	33,295,869	35,117,007	410,720,304
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	76,176,500	96,142,634	111,178,018	103,380,374	104,831,893	116,567,042	104,608,148	117,495,438	120,468,713	119,657,505	135,985,659	137,354,454	149,191,309	142,836,702	161,409,641	1,797,284,030
Great Lakes	30,600,352	33,110,020	42,322,053	41,979,520	39,208,758	41,909,661	43,796,599	42,569,404	47,184,061	48,515,600	50,253,556	55,211,517	55,460,315	58,807,293	58,867,812	689,796,519
Viking/ANR ML-7	35,275,691	40,840,816	49,685,217	48,082,621	46,653,370	50,601,068	49,830,011	51,258,493	55,012,378	55,819,570	60,100,851	63,475,421	65,985,231	66,996,882	70,695,251	810,312,872
Vector	67,466,964	79,389,827	95,985,238	91,707,096	89,020,916	97,285,904	93,541,117	98,126,480	104,426,467	105,276,358	114,723,479	120,790,511	126,365,332	127,035,881	135,512,251	1,546,653,819
Panhandle Field Zone	121,829,772	143,075,367	173,451,108	166,040,544	160,756,698	174,946,214	170,660,409	176,672,875	189,590,136	191,504,803	207,655,457	218,307,870	227,715,100	229,811,147	244,084,657	2,796,102,156
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,835,287	96,227,005	116,877,079	112,526,215	108,750,776	118,163,211	115,652,800	119,331,498	128,003,328	129,601,675	139,952,448	147,969,471	153,896,659	156,085,737	164,852,193	1,890,725,381
ANR SW	167,684,395	197,052,780	238,785,401	228,446,548	221,247,448	240,798,391	234,782,254	243,203,903	260,892,917	263,473,606	285,808,186	300,346,888	313,362,414	316,119,185	335,925,234	3,847,929,550
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	581,868,960	685,838,448	828,284,115	792,162,919	770,469,859	840,271,491	812,871,337	848,658,091	905,577,998	913,849,116	994,479,636	1,043,456,131	1,091,976,360	1,097,692,826	1,171,347,039	13,378,804,327

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Total Gas Supply Portfolio Costs																
(\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	76,176,500	96,142,634	111,178,018	103,380,374	104,831,893	116,567,042	104,608,148	117,495,438	120,468,713	119,657,505	135,985,659	137,354,454	149,191,309	142,836,702	161,409,641	1,797,284,030
Great Lakes	39,480,487	42,009,527	51,289,721	50,943,921	48,151,784	50,872,474	52,772,909	51,536,594	56,185,310	57,526,239	59,277,351	64,271,645	64,522,296	67,893,770	67,955,018	824,689,047
Viking/ANR ML-7	37,744,183	43,314,874	52,168,119	50,563,921	49,133,241	53,084,886	52,313,058	53,742,969	57,500,607	58,308,606	62,594,169	65,972,113	68,484,434	69,497,096	73,199,163	847,621,438
Vector	72,561,672	84,685,290	101,570,981	97,225,129	94,496,050	102,902,880	99,099,579	103,762,884	110,172,004	111,038,768	120,645,236	126,818,228	132,486,853	133,171,015	141,791,555	1,632,428,124
Panhandle Field Zone	141,977,940	164,495,538	196,743,171	188,931,143	183,333,433	198,391,518	193,869,700	200,229,861	213,942,769	216,008,437	233,137,526	244,485,442	254,475,188	256,743,605	271,874,552	3,158,639,825
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	85,218,352	98,731,947	119,564,748	115,170,059	111,360,071	120,856,347	118,321,152	122,034,398	130,782,999	132,392,263	142,835,974	150,920,167	156,899,324	159,103,747	167,949,651	1,932,141,198
ANR SW	186,563,986	217,023,713	260,362,363	249,679,066	242,210,679	262,506,830	256,288,200	265,008,162	283,379,818	286,090,061	309,264,111	324,399,533	337,914,841	340,819,501	361,361,206	4,182,872,069
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	644,252,834	750,933,239	897,406,836	860,423,328	838,046,866	909,711,691	881,802,461	918,340,019	976,961,933	985,551,592	1,068,269,740	1,118,751,295	1,168,503,958	1,174,595,150	1,169,914,629	14,443,621,440
Delivered Gas Price (\$/Dth)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.77	\$5.55	\$6.74	\$6.51	\$6.31	\$6.85	\$6.72	\$6.93	\$7.43	\$7.53	\$8.12	\$8.56	\$8.92	\$9.03	\$9.56	\$7.30
Great Lakes	\$6.88	\$7.65	\$8.84	\$8.62	\$8.43	\$8.98	\$8.85	\$9.06	\$9.56	\$9.67	\$10.26	\$10.71	\$11.06	\$11.18	\$11.71	\$9.43
Viking/ANR ML-7	\$5.09	\$5.86	\$7.04	\$6.82	\$6.63	\$7.17	\$7.05	\$7.26	\$7.76	\$7.86	\$8.45	\$8.90	\$9.25	\$9.37	\$9.89	\$7.63
Vector	\$5.03	\$5.77	\$7.01	\$6.76	\$6.50	\$7.05	\$6.91	\$7.11	\$7.62	\$7.71	\$8.29	\$8.81	\$9.11	\$9.27	\$9.73	\$7.51
Panhandle Field Zone	\$5.19	\$6.01	\$7.19	\$6.90	\$6.69	\$7.25	\$7.08	\$7.31	\$7.82	\$7.89	\$8.51	\$8.93	\$9.29	\$9.38	\$9.93	\$7.69
Trunkline/Panhandle																
ANR Alliance	\$4.84	\$5.62	\$6.77	\$6.53	\$6.33	\$6.87	\$6.72	\$6.93	\$7.43	\$7.52	\$8.12	\$8.55	\$8.91	\$9.02	\$9.54	\$7.31
ANR SW	\$4.92	\$5.71	\$6.86	\$6.58	\$6.38	\$6.91	\$6.75	\$6.98	\$7.47	\$7.54	\$8.15	\$8.55	\$8.90	\$8.98	\$9.52	\$7.35
ANR SE																
Nexus																
Average Delivered Gas Price	\$5.08	\$5.87	\$7.04	\$6.78	\$6.58	\$7.12	\$6.97	\$7.19	\$7.69	\$7.77	\$8.38	\$8.80	\$9.16	\$9.26	\$9.79	\$7.56
Total Cost By Category (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$654,096,810
Pipeline Fuel and Usage Costs	\$18,777,419	\$21,488,336	\$25,516,266	\$24,653,955	\$23,970,553	\$25,833,746	\$25,324,670	\$26,075,474	\$27,777,481	\$28,096,023	\$30,183,649	\$31,688,710	\$32,921,144	\$33,295,869	\$35,117,007	\$410,720,304
Commodity Purchase Costs	\$581,868,960	\$685,838,448	\$828,284,115	\$792,162,919	\$770,469,859	\$840,271,491	\$812,871,337	\$848,658,091	\$905,577,998	\$913,849,116	\$994,479,636	\$1,043,456,131	\$1,091,976,360	\$1,097,692,826	\$1,171,347,039	\$13,378,804,327
Total Costs	\$644,252,834	\$750,933,239	\$897,406,836	\$860,423,328	\$838,046,866	\$909,711,691	\$881,802,461	\$918,340,019	\$976,961,933	\$985,551,592	\$1,068,269,740	\$1,118,751,295	\$1,168,503,958	\$1,174,595,150	\$1,250,070,500	\$14,443,621,440

C.7 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 3.25 Bcfd Capacity Expansion Scenario

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Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390

Source of Supply/ Transportation Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Commodity Purchase Price (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.77	\$5.55	\$6.74	\$6.51	\$6.31	\$6.85	\$6.72	\$6.93	\$7.43	\$7.53	\$8.12	\$8.56	\$8.92	\$9.03	\$9.56	\$7.30
Great Lakes	\$4.76	\$5.52	\$6.71	\$6.48	\$6.30	\$6.84	\$6.72	\$6.92	\$7.42	\$7.53	\$8.12	\$8.56	\$8.91	\$9.03	\$9.55	\$7.29
Viking/ANR ML-7	\$4.76	\$5.52	\$6.71	\$6.48	\$6.30	\$6.84	\$6.72	\$6.92	\$7.42	\$7.53	\$8.12	\$8.56	\$8.91	\$9.03	\$9.55	\$7.29
Vector	\$4.70	\$5.47	\$6.62	\$6.37	\$6.18	\$6.71	\$6.57	\$6.78	\$7.27	\$7.36	\$7.96	\$8.38	\$8.74	\$8.84	\$9.36	\$7.15
Panhandle Field Zone	\$4.45	\$5.22	\$6.34	\$6.07	\$5.87	\$6.39	\$6.24	\$6.45	\$6.93	\$7.00	\$7.58	\$7.98	\$8.32	\$8.40	\$8.91	\$6.81
Trunkline/Panhandle	\$4.45	\$5.22	\$6.34	\$6.07	\$5.87	\$6.39	\$6.24	\$6.45	\$6.93	\$7.00	\$7.58	\$7.98	\$8.32	\$8.40	\$8.91	\$6.81
ANR Alliance	\$4.70	\$5.47	\$6.62	\$6.37	\$6.18	\$6.71	\$6.57	\$6.78	\$7.27	\$7.36	\$7.96	\$8.38	\$8.74	\$8.84	\$9.36	\$7.15
ANR SW	\$4.42	\$5.19	\$6.29	\$6.02	\$5.83	\$6.34	\$6.19	\$6.40	\$6.87	\$6.94	\$7.53	\$7.91	\$8.25	\$8.33	\$8.85	\$6.76
ANR SE	\$4.59	\$5.39	\$6.53	\$6.27	\$6.06	\$6.59	\$6.43	\$6.64	\$7.13	\$7.21	\$7.80	\$8.23	\$8.59	\$8.70	\$9.22	\$7.03
Nexus	\$4.25	\$5.09	\$6.15	\$5.83	\$5.60	\$6.13	\$6.00	\$6.16	\$6.52	\$6.51	\$7.09	\$7.50	\$7.83	\$7.98	\$8.53	\$6.48

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	123,855,468
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	165,835,662
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	285,384,375
Total Pipeline Capacity Cost	55,152,013	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	827,252,983
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	316,239	335,612	403,772	400,506	379,130	398,918	412,415	403,294	437,353	446,744	459,899	496,232	498,085	522,581	523,310	6,434,087
Viking/ANR ML-7	246,057	251,622	260,466	258,864	257,434	261,382	260,611	262,039	265,793	266,600	270,882	274,256	276,766	277,778	281,476	3,972,027
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	5,259,421	6,057,208	7,174,407	6,891,809	6,710,252	7,262,402	7,022,730	7,320,114	7,749,897	7,810,787	8,440,954	8,850,129	9,222,338	9,273,928	9,837,977	114,884,354
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	885,464	1,007,342	1,190,069	1,146,244	1,111,695	1,195,537	1,170,752	1,205,300	1,282,071	1,292,989	1,385,926	1,453,096	1,505,064	1,520,409	1,599,859	18,951,818
ANR SW	6,916,208	7,955,082	9,483,897	9,156,013	8,899,673	9,609,052	9,416,296	9,700,266	10,350,089	10,473,414	11,272,525	11,840,557	12,316,311	12,457,090	13,157,378	153,003,851
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	1,531,939	1,800,741	2,182,123	2,093,616	2,025,545	2,200,753	2,148,245	2,218,335	2,380,319	2,406,856	2,606,809	2,749,918	2,868,968	2,905,924	3,081,863	35,201,955
Total Pipeline Usage Costs	15,155,328	17,407,606	20,694,733	19,947,051	19,383,729	20,928,045	20,431,049	21,109,348	22,465,523	22,697,390	24,436,995	25,664,188	26,687,532	26,957,710	28,481,863	332,448,091
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	76,176,500	96,142,634	111,178,018	103,380,374	104,831,893	116,567,042	104,608,148	117,495,438	120,468,713	119,657,505	135,985,659	137,354,454	149,191,309	142,836,702	161,409,641	1,797,284,030
Great Lakes	30,600,352	33,110,020	42,322,053	41,979,520	39,208,758	41,909,661	43,796,599	42,569,404	47,184,061	48,515,600	50,253,556	55,211,517	55,460,315	58,807,293	58,867,812	689,796,519
Viking/ANR ML-7	35,275,691	40,840,816	49,685,217	48,082,621	46,653,370	50,601,068	49,830,011	51,258,493	55,012,378	55,819,570	60,100,851	63,475,421	65,985,231	66,996,882	70,695,251	810,312,872
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	72,245,778	85,552,975	103,746,163	98,628,038	95,593,680	104,662,361	100,497,273	105,600,049	112,550,517	113,219,178	123,626,232	129,846,730	135,873,120	136,243,395	145,632,084	1,663,517,573
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,835,287	96,227,005	116,877,079	112,526,215	108,750,776	118,163,211	115,652,800	119,331,498	128,003,328	129,601,675	139,952,448	147,969,471	153,896,659	156,085,737	164,852,193	1,890,725,381
ANR SW	159,622,645	187,579,088	227,305,334	217,463,541	210,610,551	229,221,546	223,494,646	231,511,408	248,349,988	250,806,606	272,067,408	285,907,134	298,296,913	300,921,147	319,774,982	3,662,932,937
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	116,331,975	139,524,376	168,218,289	159,434,364	153,404,757	167,875,697	164,103,410	168,619,056	178,497,136	178,236,980	194,093,107	205,255,637	214,531,763	218,383,148	233,676,639	2,660,186,334
Total Commodity Cost	573,088,228	678,976,914	819,332,154	781,494,673	759,053,785	829,000,585	801,982,887	836,385,346	890,066,119	895,857,112	976,079,261	1,025,020,363	1,073,235,312	1,080,274,304	1,154,908,602	13,174,755,646

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(\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	76,176,500	96,142,634	111,178,018	103,380,374	104,831,893	116,567,042	104,608,148	117,495,438	120,468,713	119,657,505	135,985,659	137,354,454	149,191,309	142,836,702	161,409,641	1,797,284,030
Great Lakes	39,480,487	42,009,527	51,289,721	50,943,921	48,151,784	50,872,474	52,772,909	51,536,594	56,185,310	57,526,239	59,277,351	64,271,645	64,522,296	67,893,770	67,955,018	824,689,047
Viking/ANR ML-7	37,744,183	43,314,874	52,168,119	50,563,921	49,133,241	53,084,886	52,313,058	53,742,969	57,500,607	58,308,606	62,594,169	65,972,113	68,484,434	69,497,096	73,199,163	847,621,438
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	85,762,230	99,867,214	119,177,601	113,776,878	110,560,962	120,181,794	115,777,034	121,177,195	128,557,444	129,286,996	140,324,217	146,953,891	153,352,490	153,774,355	163,727,093	1,902,257,395
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	85,218,352	98,731,947	119,564,748	115,170,059	111,360,071	120,856,347	118,321,152	122,034,398	130,782,999	132,392,263	142,835,974	150,920,167	156,899,324	159,103,747	167,949,651	1,932,141,198
ANR SW	177,594,564	206,589,881	247,844,942	237,675,265	230,565,935	249,886,309	243,966,652	252,267,385	269,755,788	272,335,731	294,395,644	308,803,401	321,668,935	324,433,948	343,988,071	3,981,772,450
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	136,889,540	160,350,742	189,426,036	180,553,604	174,455,927	189,102,075	185,277,280	189,863,016	199,903,080	199,669,461	215,725,540	227,031,180	236,426,357	240,314,696	255,784,127	2,980,772,664
Total Gas Supply Portfolio Cost	643,395,569	751,534,590	895,176,956	856,591,793	833,587,584	905,078,699	877,564,005	912,644,764	967,681,711	973,704,571	1,055,666,325	1,105,834,621	1,155,072,914	1,162,382,083	1,238,540,534	14,334,456,720
Delivered Gas Price (\$/Dth)																
MichCon Citygate	\$4.77	\$5.55	\$6.74	\$6.50	\$6.31	\$6.85	\$6.72	\$6.93	\$7.43	\$7.53	\$8.12	\$8.56	\$8.92	\$9.03	\$9.56	\$7.30
Great Lakes	\$6.88	\$7.66	\$8.85	\$8.62	\$8.44	\$8.98	\$8.85	\$9.07	\$9.57	\$9.67	\$10.27	\$10.71	\$11.07	\$11.19	\$11.71	\$9.43
Viking/ANR ML-7	\$5.09	\$5.86	\$7.04	\$6.82	\$6.63	\$7.17	\$7.05	\$7.26	\$7.76	\$7.86	\$8.45	\$8.89	\$9.25	\$9.36	\$9.89	\$7.63
Vector	\$4.61	\$5.29	\$6.43	\$6.20	\$5.96	\$6.46	\$6.34	\$6.52	\$6.99	\$7.07	\$7.60	\$8.07	\$8.35	\$8.50	\$8.92	\$6.89
Panhandle Field Zone	\$5.59	\$6.42	\$7.59	\$7.31	\$7.10	\$7.65	\$7.49	\$7.72	\$8.22	\$8.30	\$8.92	\$9.34	\$9.70	\$9.79	\$10.34	\$8.10
Trunkline/Panhandle																
ANR Alliance	\$4.83	\$5.62	\$6.77	\$6.52	\$6.33	\$6.87	\$6.72	\$6.93	\$7.42	\$7.52	\$8.12	\$8.55	\$8.91	\$9.01	\$9.54	\$7.31
ANR SW	\$4.91	\$5.72	\$6.86	\$6.58	\$6.38	\$6.92	\$6.75	\$6.98	\$7.47	\$7.54	\$8.15	\$8.55	\$8.90	\$8.98	\$9.52	\$7.35
ANR SE																
Nexus	\$5.00	\$5.86	\$6.92	\$6.60	\$6.37	\$6.91	\$6.77	\$6.94	\$7.30	\$7.29	\$7.88	\$8.29	\$8.64	\$8.78	\$9.34	\$7.26
Average Delivered Gas Price	\$5.07	\$5.88	\$7.02	\$6.74	\$6.54	\$7.08	\$6.93	\$7.14	\$7.61	\$7.67	\$8.28	\$8.69	\$9.05	\$9.15	\$9.70	\$7.50
Total Cost By Category (\$)																
Pipeline Capacity Costs	\$55,152,013	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$827,252,983
Pipeline Fuel and Usage Costs	\$15,155,328	\$17,407,606	\$20,694,733	\$19,947,051	\$19,383,729	\$20,928,045	\$20,431,049	\$21,109,348	\$22,465,523	\$22,697,390	\$24,436,995	\$25,664,188	\$26,687,532	\$26,957,710	\$28,481,863	\$332,448,091
Commodity Purchase Costs	\$573,088,228	\$678,976,914	\$819,332,154	\$781,494,673	\$759,053,785	\$829,000,585	\$801,982,887	\$836,385,346	\$890,066,119	\$895,857,112	\$976,079,261	\$1,025,020,363	\$1,073,235,312	\$1,080,274,304	\$1,154,908,602	\$13,174,755,646
Total Costs	\$643,395,569	\$751,534,590	\$895,176,956	\$856,591,793	\$833,587,584	\$905,078,699	\$877,564,005	\$912,644,764	\$967,681,711	\$973,704,571	\$1,055,666,325	\$1,105,834,621	\$1,155,072,914	\$1,162,382,083	\$1,238,540,534	\$14,334,456,720

C.8 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – 4.75 Bcfd Capacity Expansion Scenario

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
Page 1 of 4																
Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390

Source of Supply/ Transportation Utilization (Dth/Day)																
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552	39,552
Panhandle Field Zone	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
Page 2 of 4																
Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.73	\$5.51	\$6.68	\$6.44	\$6.21	\$6.71	\$6.62	\$6.73	\$7.27	\$7.43	\$7.89	\$8.33	\$8.77	\$8.83	\$9.39	\$7.17
Great Lakes	\$4.73	\$5.49	\$6.65	\$6.43	\$6.22	\$6.72	\$6.64	\$6.75	\$7.29	\$7.46	\$7.92	\$8.35	\$8.79	\$8.85	\$9.40	\$7.18
Viking/ANR ML-7	\$4.73	\$5.49	\$6.65	\$6.43	\$6.22	\$6.72	\$6.64	\$6.75	\$7.29	\$7.46	\$7.92	\$8.35	\$8.79	\$8.85	\$9.40	\$7.18
Vector	\$4.67	\$5.45	\$6.59	\$6.35	\$6.12	\$6.62	\$6.51	\$6.62	\$7.16	\$7.31	\$7.77	\$8.20	\$8.63	\$8.68	\$9.24	\$7.06
Panhandle Field Zone	\$4.45	\$5.23	\$6.34	\$6.08	\$5.85	\$6.34	\$6.23	\$6.35	\$6.87	\$7.01	\$7.45	\$7.86	\$8.28	\$8.30	\$8.84	\$6.76
Trunkline/Panhandle	\$4.45	\$5.23	\$6.34	\$6.08	\$5.85	\$6.34	\$6.23	\$6.35	\$6.87	\$7.01	\$7.45	\$7.86	\$8.28	\$8.30	\$8.84	\$6.76
ANR Alliance	\$4.67	\$5.45	\$6.59	\$6.35	\$6.12	\$6.62	\$6.51	\$6.62	\$7.16	\$7.31	\$7.77	\$8.20	\$8.63	\$8.68	\$9.24	\$7.06
ANR SW	\$4.42	\$5.19	\$6.29	\$6.03	\$5.81	\$6.29	\$6.18	\$6.30	\$6.82	\$6.95	\$7.40	\$7.80	\$8.21	\$8.23	\$8.77	\$6.71
ANR SE	\$4.59	\$5.40	\$6.54	\$6.28	\$6.04	\$6.54	\$6.43	\$6.54	\$7.08	\$7.22	\$7.68	\$8.11	\$8.55	\$8.60	\$9.16	\$6.98
Nexus	\$4.28	\$5.13	\$6.20	\$5.90	\$5.68	\$6.19	\$6.11	\$6.20	\$6.67	\$6.76	\$7.20	\$7.60	\$8.02	\$8.08	\$8.66	\$6.58

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
Page 3 of 4																
Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	3,919,140	58,787,100
Panhandle Field Zone	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	11,259,588	168,893,820
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	11,614,080	174,211,200
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	43,606,454	654,096,810
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	314,727	333,148	401,379	396,320	373,949	393,110	404,872	397,377	424,790	441,308	453,628	480,004	494,066	512,611	515,382	6,336,671
Viking/ANR ML-7	245,831	251,372	260,070	258,448	256,816	260,526	259,999	260,808	264,765	266,109	269,441	272,677	275,903	276,430	280,337	3,959,532
Vector	1,166,838	1,368,229	1,653,288	1,588,281	1,535,015	1,668,379	1,621,792	1,673,083	1,801,356	1,828,775	1,956,082	2,060,969	2,170,502	2,173,790	2,320,642	26,587,022
Panhandle Field Zone	8,846,299	10,123,085	11,977,155	11,585,105	11,214,601	12,028,333	11,854,207	12,044,846	12,918,325	13,163,651	13,916,154	14,616,720	15,334,759	15,409,343	16,324,558	191,357,140
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	885,713	1,007,672	1,189,788	1,147,844	1,108,673	1,187,540	1,168,952	1,189,124	1,273,585	1,294,810	1,366,646	1,433,414	1,498,893	1,504,292	1,587,552	18,844,498
ANR SW	7,229,235	8,324,680	9,915,419	9,579,052	9,261,170	9,959,329	9,809,933	9,973,496	10,722,916	10,933,398	11,579,024	12,180,089	12,796,146	12,860,137	13,645,364	158,769,389
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	18,688,642	21,408,185	25,397,099	24,555,051	23,750,224	25,497,217	25,119,756	25,538,735	27,405,737	27,928,051	29,540,975	31,043,873	32,570,270	32,736,602	34,673,835	405,854,252
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,182,490	95,747,230	109,958,513	103,085,544	103,230,960	113,987,163	104,044,229	112,481,541	120,471,733	118,229,915	130,604,180	135,720,192	145,521,809	139,773,904	158,422,591	1,766,461,993
Great Lakes	30,520,837	32,831,152	42,043,430	41,447,036	38,610,979	41,253,044	42,919,747	41,918,838	45,612,310	47,946,873	49,590,152	53,151,161	55,065,376	57,578,467	57,871,901	678,361,303
Viking/ANR ML-7	35,050,163	40,590,578	49,289,116	47,666,889	46,034,832	49,745,448	49,218,299	50,027,282	53,984,284	55,327,994	58,659,997	61,895,751	65,122,216	65,649,373	69,555,833	797,818,054
Vector	67,057,282	79,085,792	95,488,564	91,474,705	88,092,506	95,851,821	92,867,136	95,716,779	103,349,734	104,635,427	112,138,233	118,313,416	124,734,335	124,806,324	133,566,945	1,527,178,999
Panhandle Field Zone	121,880,567	143,151,493	173,401,612	166,308,062	160,309,586	173,608,758	170,437,784	173,867,764	188,182,229	191,842,269	204,075,715	215,133,691	226,619,762	227,057,177	242,100,378	2,777,976,847
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,377,299	95,808,698	116,286,980	112,045,469	107,607,342	116,457,034	114,582,990	116,647,945	126,106,418	128,723,972	136,845,232	144,595,683	152,131,263	153,260,503	162,573,013	1,866,049,839
ANR SW	167,752,775	197,160,114	238,713,126	228,819,849	220,631,762	238,952,860	234,484,421	239,308,193	258,980,091	263,945,491	280,845,069	296,002,855	311,833,155	312,338,269	333,194,917	3,822,962,946
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	579,821,413	684,375,057	825,181,342	790,847,555	764,517,967	829,856,127	808,554,605	829,968,343	896,686,798	910,651,940	972,758,576	1,024,812,748	1,081,027,915	1,080,464,017	1,157,285,577	13,236,809,980

Michigan Public Service Commission																
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Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
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Total Gas Supply Portfolio Costs																
(\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,182,490	95,747,230	109,958,513	103,085,544	103,230,960	113,987,163	104,044,229	112,481,541	120,471,733	118,229,915	130,604,180	135,720,192	145,521,809	139,773,904	158,422,591	1,766,461,993
Great Lakes	39,399,460	41,728,196	51,008,705	50,407,253	47,548,824	50,210,049	51,888,515	50,880,112	54,600,995	56,952,077	58,607,676	62,195,061	64,123,339	66,654,974	66,951,179	813,156,414
Viking/ANR ML-7	37,518,430	43,064,385	51,771,622	50,147,773	48,514,084	52,228,410	51,700,734	52,510,526	56,471,485	57,816,539	61,151,874	64,390,863	67,620,555	68,148,239	72,058,605	835,114,126
Vector	72,143,259	84,373,161	101,060,993	96,982,127	93,546,661	101,439,340	98,408,068	101,309,003	109,070,229	110,383,343	118,013,455	124,293,525	130,823,977	130,899,254	139,806,727	1,612,553,121
Panhandle Field Zone	141,986,454	164,534,165	196,638,355	189,152,756	182,783,776	196,896,679	193,551,579	197,172,198	212,360,142	216,265,507	229,251,457	241,009,998	253,214,109	253,726,108	269,684,524	3,138,227,807
Trunkline/Panhandle	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	3,547,250	53,208,750
ANR Alliance	84,760,612	98,313,970	118,974,367	114,690,913	110,213,615	119,142,174	117,249,543	119,334,669	128,877,603	131,516,382	139,709,478	147,526,697	155,127,756	156,262,394	165,658,165	1,907,358,337
ANR SW	186,596,091	217,098,874	260,242,625	250,012,981	241,507,012	260,526,268	255,908,434	260,895,769	281,317,086	286,492,969	304,038,173	319,797,024	336,243,381	336,812,486	358,454,361	4,155,943,535
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	642,116,510	749,389,696	894,184,895	859,009,060	831,874,645	898,959,798	877,280,815	899,113,532	967,698,988	982,186,445	1,045,906,005	1,099,463,075	1,157,204,639	1,156,807,073	1,152,619,820	14,296,761,042
Delivered Gas Price (\$/Dth)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.73	\$5.51	\$6.68	\$6.44	\$6.21	\$6.71	\$6.62	\$6.73	\$7.27	\$7.43	\$7.89	\$8.33	\$8.77	\$8.83	\$9.39	\$7.17
Great Lakes	\$6.85	\$7.61	\$8.79	\$8.56	\$8.35	\$8.86	\$8.77	\$8.89	\$9.43	\$9.60	\$10.06	\$10.50	\$10.94	\$11.00	\$11.55	\$9.32
Viking/ANR ML-7	\$5.06	\$5.82	\$6.99	\$6.76	\$6.55	\$7.06	\$6.97	\$7.09	\$7.62	\$7.80	\$8.26	\$8.69	\$9.13	\$9.19	\$9.73	\$7.52
Vector	\$5.01	\$5.74	\$6.98	\$6.73	\$6.43	\$6.95	\$6.85	\$6.96	\$7.51	\$7.66	\$8.13	\$8.60	\$9.01	\$9.11	\$9.59	\$7.42
Panhandle Field Zone	\$5.19	\$6.01	\$7.19	\$6.91	\$6.67	\$7.19	\$7.07	\$7.20	\$7.76	\$7.90	\$8.37	\$8.81	\$9.25	\$9.27	\$9.85	\$7.64
Trunkline/Panhandle																
ANR Alliance	\$4.81	\$5.59	\$6.74	\$6.50	\$6.27	\$6.77	\$6.66	\$6.78	\$7.32	\$7.47	\$7.93	\$8.37	\$8.81	\$8.85	\$9.41	\$7.22
ANR SW	\$4.92	\$5.72	\$6.86	\$6.59	\$6.36	\$6.86	\$6.74	\$6.87	\$7.41	\$7.55	\$8.01	\$8.43	\$8.86	\$8.87	\$9.44	\$7.30
ANR SE																
Nexus																
Average Delivered Gas Price	\$5.06	\$5.86	\$7.02	\$6.76	\$6.53	\$7.04	\$6.93	\$7.05	\$7.60	\$7.74	\$8.21	\$8.64	\$9.08	\$9.12	\$9.68	\$7.49
Total Cost By Category (\$)																
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$43,606,454	\$654,096,810
Pipeline Fuel and Usage Costs	\$18,688,642	\$21,408,185	\$25,397,099	\$24,555,051	\$23,750,224	\$25,497,217	\$25,119,756	\$25,538,735	\$27,405,737	\$27,928,051	\$29,540,975	\$31,043,873	\$32,570,270	\$32,736,602	\$34,673,835	\$405,854,252
Commodity Purchase Costs	\$579,821,413	\$684,375,057	\$825,181,342	\$790,847,555	\$764,517,967	\$829,856,127	\$808,554,605	\$829,968,343	\$896,686,798	\$910,651,940	\$972,758,576	\$1,024,812,748	\$1,081,027,915	\$1,080,464,017	\$1,157,285,577	\$13,236,809,980
Total Costs	\$642,116,510	\$749,389,696	\$894,184,895	\$859,009,060	\$831,874,645	\$898,959,798	\$877,280,815	\$899,113,532	\$967,698,988	\$982,186,445	\$1,045,906,005	\$1,099,463,075	\$1,157,204,639	\$1,156,807,073	\$1,235,565,866	\$14,296,761,042

C.9 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – 4.75 Bcfd Capacity Expansion Scenario

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs With NEXUS Capacity																
November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
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Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167	14,167
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Average Pipeline Capacity	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390	365,390
Source of Supply/ Transportation																
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605	44,605
Great Lakes	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145	17,145
Viking/ANR ML-7	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296	20,296
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552	44,552
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335	48,335
ANR SW	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Total Utilization	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934	348,934

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs With NEXUS Capacity																
November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028	\$0.028
Vector	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001	\$0.001
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016	\$0.016
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Great Lakes	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Viking/ANR ML-7	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Vector	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Panhandle Field Zone	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
ANR SW	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Commodity Purchase Price (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$4.73	\$5.51	\$6.68	\$6.44	\$6.21	\$6.71	\$6.62	\$6.73	\$7.27	\$7.43	\$7.89	\$8.33	\$8.77	\$8.83	\$9.39	\$7.17
Great Lakes	\$4.73	\$5.49	\$6.65	\$6.43	\$6.22	\$6.72	\$6.64	\$6.75	\$7.29	\$7.46	\$7.92	\$8.35	\$8.79	\$8.85	\$9.40	\$7.18
Viking/ANR ML-7	\$4.73	\$5.49	\$6.65	\$6.43	\$6.22	\$6.72	\$6.64	\$6.75	\$7.29	\$7.46	\$7.92	\$8.35	\$8.79	\$8.85	\$9.40	\$7.18
Vector	\$4.67	\$5.45	\$6.59	\$6.35	\$6.12	\$6.62	\$6.51	\$6.62	\$7.16	\$7.31	\$7.77	\$8.20	\$8.63	\$8.68	\$9.24	\$7.06
Panhandle Field Zone	\$4.45	\$5.23	\$6.34	\$6.08	\$5.85	\$6.34	\$6.23	\$6.35	\$6.87	\$7.01	\$7.45	\$7.86	\$8.28	\$8.30	\$8.84	\$6.76
Trunkline/Panhandle	\$4.45	\$5.23	\$6.34	\$6.08	\$5.85	\$6.34	\$6.23	\$6.35	\$6.87	\$7.01	\$7.45	\$7.86	\$8.28	\$8.30	\$8.84	\$6.76
ANR Alliance	\$4.67	\$5.45	\$6.59	\$6.35	\$6.12	\$6.62	\$6.51	\$6.62	\$7.16	\$7.31	\$7.77	\$8.20	\$8.63	\$8.68	\$9.24	\$7.06
ANR SW	\$4.42	\$5.19	\$6.29	\$6.03	\$5.81	\$6.29	\$6.18	\$6.30	\$6.82	\$6.95	\$7.40	\$7.80	\$8.21	\$8.23	\$8.77	\$6.71
ANR SE	\$4.59	\$5.40	\$6.54	\$6.28	\$6.04	\$6.54	\$6.43	\$6.54	\$7.08	\$7.22	\$7.68	\$8.11	\$8.55	\$8.60	\$9.16	\$6.98
Nexus	\$4.28	\$5.13	\$6.20	\$5.90	\$5.68	\$6.19	\$6.11	\$6.20	\$6.67	\$6.76	\$7.20	\$7.60	\$8.02	\$8.08	\$8.66	\$6.58

Michigan Public Service Commission																
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Projected Transportation Utilization, Reservation Costs, and Usage Costs With NEXUS Capacity																
November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	8,563,896	128,458,440
Viking/ANR ML-7	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	2,222,436	33,336,540
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	8,257,031	123,855,468
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	1,497,600	22,464,000
ANR SW	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	11,055,711	165,835,662
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	285,384,375
Total Pipeline Capacity Cost	55,152,013	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	55,150,069	827,252,983
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	314,727	333,148	401,379	396,320	373,949	393,110	404,872	397,377	424,790	441,308	453,628	480,004	494,066	512,611	515,382	6,336,671
Viking/ANR ML-7	245,831	251,372	260,070	258,448	256,816	260,526	259,999	260,808	264,765	266,109	269,441	272,677	275,903	276,430	280,337	3,959,532
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	5,232,103	6,036,527	7,141,018	6,874,852	6,647,896	7,166,152	6,976,060	7,159,177	7,673,860	7,767,100	8,265,934	8,681,915	9,113,755	9,123,032	9,707,931	113,567,312
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	885,713	1,007,672	1,189,788	1,147,844	1,108,673	1,187,540	1,168,952	1,189,124	1,273,585	1,294,810	1,366,646	1,433,414	1,498,893	1,504,292	1,587,552	18,844,498
ANR SW	6,881,676	7,924,455	9,438,716	9,118,521	8,815,922	9,480,515	9,338,302	9,494,001	10,207,391	10,407,754	11,022,340	11,594,508	12,180,947	12,241,861	12,989,337	151,136,245
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	1,533,690	1,803,155	2,182,798	2,098,226	2,019,795	2,185,298	2,146,155	2,185,666	2,363,825	2,412,022	2,566,392	2,707,687	2,855,211	2,871,121	3,061,701	34,992,743
Total Pipeline Usage Costs	15,093,739	17,356,329	20,613,768	19,894,211	19,223,051	20,673,141	20,294,340	20,686,154	22,208,216	22,589,103	23,944,381	25,170,205	26,418,776	26,529,347	28,142,241	328,837,001
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,182,490	95,747,230	109,958,513	103,085,544	103,230,960	113,987,163	104,044,229	112,481,541	120,471,733	118,229,915	130,604,180	135,720,192	145,521,809	139,773,904	158,422,591	1,766,461,993
Great Lakes	30,520,837	32,831,152	42,043,430	41,447,036	38,610,979	41,253,044	42,919,747	41,918,838	45,612,310	47,946,873	49,590,152	53,151,161	55,065,376	57,578,467	57,871,901	678,361,303
Viking/ANR ML-7	35,050,163	40,590,578	49,289,116	47,666,889	46,034,832	49,745,448	49,218,299	50,027,282	53,984,284	55,327,994	58,659,997	61,895,751	65,122,216	65,649,373	69,555,833	797,818,054
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	72,200,613	85,577,063	103,650,987	98,884,697	95,232,704	103,742,365	100,433,712	103,641,222	112,085,444	113,393,572	121,524,016	128,074,056	134,980,920	134,599,958	144,234,848	1,652,256,174
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	82,377,299	95,808,698	116,286,980	112,045,469	107,607,342	116,457,034	114,582,990	116,647,945	126,106,418	128,723,972	136,845,232	144,595,683	152,131,263	153,260,503	162,573,013	1,866,049,839
ANR SW	159,687,738	187,681,262	227,236,534	217,818,895	210,024,466	227,464,741	223,211,131	227,802,991	246,529,125	251,255,804	267,342,902	281,771,948	296,841,176	297,322,006	317,175,930	3,639,166,650
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	117,285,006	140,513,529	169,542,397	161,591,673	155,516,149	169,606,412	167,308,947	169,866,233	182,636,550	185,086,006	197,024,525	208,031,943	219,618,878	221,104,275	237,142,634	2,701,875,160
Total Commodity Cost	572,304,146	678,749,513	818,007,956	782,540,204	756,257,431	822,256,206	801,719,055	822,386,052	887,425,863	899,964,135	961,591,003	1,013,240,734	1,069,281,637	1,069,288,486	1,146,976,750	13,101,989,173

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November 2017 - October 2032																
4.75 Bcfd NEXUS + Rover Capacity Expansion Scenario																
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Total Gas Supply Portfolio Costs																
(\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	75,182,490	95,747,230	109,958,513	103,085,544	103,230,960	113,987,163	104,044,229	112,481,541	120,471,733	118,229,915	130,604,180	135,720,192	145,521,809	139,773,904	158,422,591	1,766,461,993
Great Lakes	39,399,460	41,728,196	51,008,705	50,407,253	47,548,824	50,210,049	51,888,515	50,880,112	54,600,995	56,952,077	58,607,676	62,195,061	64,123,339	66,654,974	66,951,179	813,156,414
Viking/ANR ML-7	37,518,430	43,064,385	51,771,622	50,147,773	48,514,084	52,228,410	51,700,734	52,510,526	56,471,485	57,816,539	61,151,874	64,390,863	67,620,555	68,148,239	72,058,605	835,114,126
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	85,689,747	99,870,621	119,049,035	114,016,580	110,137,631	119,165,548	115,666,802	119,057,430	128,016,335	129,417,702	138,046,981	145,013,002	152,351,706	151,980,021	162,199,811	1,889,678,954
Trunkline/Panhandle	3,547,250	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	3,545,306	53,181,538
ANR Alliance	84,760,612	98,313,970	118,974,367	114,690,913	110,213,615	119,142,174	117,249,543	119,334,669	128,877,603	131,516,382	139,709,478	147,526,697	155,127,756	156,262,394	165,658,165	1,907,358,337
ANR SW	177,625,125	206,661,428	247,730,961	237,993,126	229,896,098	248,000,967	243,605,144	248,352,703	267,792,226	272,719,269	289,420,953	304,422,167	320,077,833	320,619,578	341,220,978	3,956,138,557
ANR SE	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	982,464	14,736,960
Nexus	137,844,321	161,342,310	190,750,820	182,715,524	176,561,569	190,817,335	188,480,728	191,077,524	204,026,000	206,523,654	218,616,543	229,765,256	241,499,714	243,001,021	259,229,961	3,022,252,278
Total Gas Supply Portfolio Cost	642,549,898	751,255,911	893,771,793	857,584,484	830,630,551	898,079,417	877,163,464	898,222,276	964,784,148	977,703,307	1,040,685,454	1,093,561,008	1,150,850,482	1,150,967,902	1,230,269,060	14,258,079,157
Delivered Gas Price (\$/Dth)																
MichCon Citygate	\$4.73	\$5.51	\$6.68	\$6.44	\$6.21	\$6.71	\$6.61	\$6.73	\$7.27	\$7.42	\$7.89	\$8.33	\$8.77	\$8.83	\$9.39	\$7.17
Great Lakes	\$6.85	\$7.62	\$8.79	\$8.56	\$8.35	\$8.86	\$8.77	\$8.90	\$9.43	\$9.61	\$10.07	\$10.50	\$10.95	\$11.00	\$11.56	\$9.32
Viking/ANR ML-7	\$5.06	\$5.82	\$6.99	\$6.76	\$6.55	\$7.06	\$6.97	\$7.09	\$7.62	\$7.80	\$8.25	\$8.69	\$9.13	\$9.18	\$9.73	\$7.51
Vector	\$4.59	\$5.27	\$6.40	\$6.17	\$5.89	\$6.37	\$6.28	\$6.38	\$6.89	\$7.02	\$7.45	\$7.88	\$8.26	\$8.35	\$8.79	\$6.80
Panhandle Field Zone	\$5.59	\$6.42	\$7.59	\$7.32	\$7.08	\$7.60	\$7.48	\$7.61	\$8.16	\$8.31	\$8.78	\$9.21	\$9.66	\$9.68	\$10.26	\$8.05
Trunkline/Panhandle																
ANR Alliance	\$4.81	\$5.60	\$6.74	\$6.50	\$6.27	\$6.77	\$6.66	\$6.78	\$7.32	\$7.47	\$7.93	\$8.36	\$8.81	\$8.85	\$9.42	\$7.22
ANR SW	\$4.92	\$5.72	\$6.86	\$6.59	\$6.36	\$6.86	\$6.74	\$6.87	\$7.41	\$7.55	\$8.01	\$8.42	\$8.86	\$8.87	\$9.44	\$7.30
ANR SE																
Nexus	\$5.04	\$5.89	\$6.97	\$6.67	\$6.45	\$6.97	\$6.89	\$6.98	\$7.45	\$7.54	\$7.99	\$8.39	\$8.82	\$8.88	\$9.47	\$7.36
Average Delivered Gas Price	\$5.07	\$5.88	\$7.01	\$6.75	\$6.52	\$7.03	\$6.93	\$7.04	\$7.57	\$7.71	\$8.17	\$8.59	\$9.03	\$9.07	\$9.64	\$7.47
Total Cost By Category (\$)																
Pipeline Capacity Costs	\$55,152,013	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$55,150,069	\$827,252,983
Pipeline Fuel and Usage Costs	\$15,093,739	\$17,356,329	\$20,613,768	\$19,894,211	\$19,223,051	\$20,673,141	\$20,294,340	\$20,686,154	\$22,208,216	\$22,589,103	\$23,944,381	\$25,170,205	\$26,418,776	\$26,529,347	\$28,142,241	\$328,837,001
Commodity Purchase Costs	\$572,304,146	\$678,749,513	\$818,007,956	\$782,540,204	\$756,257,431	\$822,256,206	\$801,719,055	\$822,386,052	\$887,425,863	\$899,964,135	\$961,591,003	\$1,013,240,734	\$1,069,281,637	\$1,069,288,486	\$1,146,976,750	\$13,101,989,173
Total Costs	\$642,549,898	\$751,255,911	\$893,771,793	\$857,584,484	\$830,630,551	\$898,079,417	\$877,163,464	\$898,222,276	\$964,784,148	\$977,703,307	\$1,040,685,454	\$1,093,561,008	\$1,150,850,482	\$1,150,967,902	\$1,230,269,060	\$14,258,079,157



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The Value of Nexus Pipeline Capacity to DTE Gas Customers: December 2015 Update

December 2015

**Submitted to:
Mr. Robert Lawshe
DTE Gas**

**Submitted by:
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1 Introduction

1.1 Purpose

ICF was engaged by DTE Gas Distribution (DTE Gas) to assess the value to DTE Gas customers of holding capacity on the proposed NEXUS Gas Transmission Project (NEXUS) from the Marcellus/Utica gas producing basins in eastern Ohio/Western Pennsylvania to the DTE Gas citygate in Michigan. ICF submitted a report to DTE Gas in December 2014 that covered these issues. That report was an independent evaluation of the value to DTE Gas customers of holding capacity on the NEXUS pipeline across a range of potential market conditions, as well as a comparison of the NEXUS pipeline to other competing pipeline proposals from the Marcellus/Utica region west to the Michigan and nearby markets. This report updates the previous report with new data and market forecasts reflecting developments in the market since the initial 2014 report was prepared.

NEXUS is a proposed pipeline that would connect the Marcellus and Utica plays in the Appalachian producing basin with upper Midwest and Canadian markets. The pipeline would consist of about 250 miles of large diameter pipe, capable of transporting up to 1.5 billion cubic feet per day (Bcfd) of gas. The pipeline would begin in eastern Ohio and extend northwesterly to interconnect with the DTE Gas Transmission System and the Vector pipeline. The pipeline will deliver natural gas produced in the Marcellus and Utica plays of the Appalachian Basin directly to gas markets in Ohio, Michigan and Ontario.

1.2 Rationale for the NEXUS Project

Fundamental changes in North American natural gas markets continue to drive DTE Gas' decision to contract for NEXUS capacity.

The shale gas revolution has greatly increased the availability of low cost natural gas supply. While there are economic shale gas plays in a variety of regions (including Western Canada, the Gulf Coast and the Mid-Continent), the majority of the production growth in North America is expected to occur in the Marcellus and Utica shale plays in the Northeastern U.S. At the same time, many conventional natural gas producing regions are in decline. The growth in shale production has offset the decline in conventional production, providing additional supply to the market and leading to lower natural gas prices than were experienced in the early 2000s.

The widespread availability of this low cost natural gas is driving rapid growth in demand, primarily for power generation in the Mid-Atlantic and South Atlantic regions, industrial demand in the Gulf Coast, LNG exports, and exports to Mexico — primarily from the Gulf Coast. Natural gas demand in western Canada for oil sands production and LNG exports is also expected to increase.

The shifts in the location of production and demand— as well as the rapid growth in production and demand— are leading to a fundamental restructuring of the natural gas transportation and distribution system in North America. The shale gas revolution is leading to widespread changes in natural gas production and transportation patterns that in turn are changing the economics of purchasing natural gas for gas distribution companies.

For utilities like DTE Gas that purchase natural gas from a variety of different sources, the changes in the market are driving significant rebalancing of natural gas supply portfolios.

This is done both to reduce the risk associated with supply sources that may be in decline and to adapt to the changes in supply basin costs resulting from the changes in the market. The significance of the NEXUS pipeline in this context is the access it provides to the growing Utica and Marcellus shale gas production in the Appalachian Basin.

1.3 Overview of Approach

ICF's assessment of the value of the NEXUS pipeline to DTE Gas customers is based on our views of developments in North American natural gas markets. Our principal analysis tool is the ICF Gas Market Model (GMM®). The GMM®, an internationally recognized model of the North American gas market, includes projections for natural gas demand by sector, conventional and unconventional natural gas resources, production costs, and other major gas market developments, such as potential LNG exports. ICF prepares four GMM® Base Cases annually that guide our analysis of the markets. Each Base Case uses the latest information on gas production costs, consumer demand by sector and region, and pipeline system (including storage) infrastructure, to develop forecasts of future supply by region and type of supply, demand by sector and region, pipeline flows across North America, and prices at over 120 market locations in North America (Canada and the United States). Of special importance are the basis spreads between market locations (i.e., the price differences between two points on the system) that yield information about markets and pipeline infrastructure congestion. These forecasts are generated on a monthly basis through 2035. The GMM® results are provided to subscription clients and are used in as a foundation for special studies for clients, including in regulatory proceedings. For special studies such as this report for DTE Gas, ICF runs the model with different sets of assumptions to evaluate the implications of different policies or proposed activities.

For this update of the 2014 report, the modeling assumptions are drawn from ICF's August 2015 natural gas market analyses. ICF compared four cases developed using the GMM® to determine the impact of the NEXUS Pipeline under two different market scenarios, with and without the development of the Rover Pipeline. The four cases were developed with the following assumptions for the Rover and NEXUS expansions:¹

- 1) A "No Pipeline Added" case where both Rover and NEXUS were excluded from forecast pipeline expansions.
- 2) A "Nexus Only" case that includes 1.5 Bcfd of incremental pipeline capacity from the Appalachian Basin into Michigan.
- 3) A "Rover Only" case that includes 3.25 Bcfd of incremental pipeline capacity from the Appalachian Basin into Michigan.
- 4) A "NEXUS and Rover" case that included 4.75 Bcfd of incremental pipeline capacity from the Appalachian Basin into Michigan.

The NEXUS Only" case was compared to the "No Pipeline Added" case to evaluate the impact of building NEXUS in the absence of Rover. The "Nexus and Rover" case was

¹ The four cases were based on the ICF August 2015 CPP Case, including the impact of the Federal Clean Power Plan, and are consistent with the scenarios used by ICF to develop the report "Impact of the NEXUS Pipeline on Michigan Energy Markets," submitted to the Michigan Public Utilities Commission in November 2015 by DTE Electric.

compared to the “Rover Only” case to evaluate the impact of NEXUS if the Rover Pipeline is also developed. Other than including or excluding the NEXUS and ROVER expansions, all other assumptions were held constant across the scenarios.

The scenarios were used to evaluate the benefits of the NEXUS Pipeline from two different perspectives:

- 1) Does construction of the NEXUS Pipeline provide benefits to DTE Gas ratepayers and to Michigan natural gas consumers, independent of the DTE Gas agreement to hold capacity on the NEXUS Pipeline?
- 2) Does the DTE Gas agreement to hold capacity on the NEXUS Pipeline provide benefits to DTE Gas ratepayers?

ICF evaluated the impact on Michigan natural gas prices resulting from the construction of the NEXUS Pipeline both with and without the Rover Pipeline in order to quantify the benefits of constructing the NEXUS pipeline to DTE Gas ratepayers and to Michigan consumers.

ICF also analyzed the impact on the DTE Gas supply portfolio of holding capacity on the NEXUS Pipeline to determine the change in gas supply costs. The total cost savings were calculated for DTE Gas’ supply portfolio, given DTE Gas’ projection of gas purchases by market area with and without the NEXUS Pipeline contract. The analysis considered the net cost impacts of holding NEXUS pipeline capacity, including changes in pipeline capacity costs, commodity purchase costs, pipeline fuel costs, and pipeline commodity costs.

The total benefits of the NEXUS Pipeline represent the sum of both of these perspectives. A more complete description of the analysis is included in Section 5 of this report.

1.4 Changes from the December 2014 Report

This report represents an update to the report “The Value of Nexus Pipeline Capacity to DTE Gas Customers” prepared by ICF for DTE Gas in December 2014. During the past year, several significant changes in natural gas markets and in the gas market outlook represented in ICF’s Base Case gas market forecast have occurred that impact the value of the Nexus Pipeline to Michigan natural gas consumers and to DTE Gas customers. The major changes include:

- The outlook for oil prices has declined substantially. The decline in oil prices has a number of impacts on natural gas markets, including:
 - Decreased demand for LNG exports.
 - Reduced exploration and development activity for both oil and natural gas, which reduces costs for remaining development.
- Development of the Marcellus and Utica shales has continued to exceed expectations, leading to an increase in ICF’s projected natural gas production potential in the Northeastern U.S., relative to last year’s forecast.
- Both the Rover Pipeline and the NEXUS Pipeline have filed for certificates of public convenience and necessity from FERC allowing NEXUS to construct, own and operate

the pipeline. The Rover Pipeline has been incorporated in the ICF Base Case. Given the current filing status of the Rover Pipeline at FERC and the announced level of contracted capacity on Rover, we believe the project is highly likely to proceed. The NEXUS filing increases the likelihood that the NEXUS project will go forward, however ICF has not yet included the pipeline project in the ICF Base Case.

- The likelihood for several pipeline projects providing take-away capacity from the Marcellus and Utica has declined, increasing the value of pipeline take-away capacity that is successfully completed.

The net result of these changes has been to increase the value of the NEXUS pipeline both to Michigan consumers and to DTE Gas consumers.

1.5 Structure of Report

Section 2 of this report provides a broad overview of ICF's long term natural gas market outlook, focusing on the changes in the North American natural gas markets likely to impact gas supplies in Michigan. In section 3, we look at the changes in gas supply and pipeline infrastructure in the Appalachian Basin, focusing on the areas that NEXUS would tap into. Section 4 provides an overview of the NEXUS Pipeline, including a review of natural gas supply around the pipeline receipt point at Kensington. Section 5 provides an assessment of the impact of the incremental pipeline capacity to Michigan and DTE Gas consumers, and the value of contracting for Nexus pipeline capacity to DTE Gas customers. Section 5 also documents the model outcomes of the various cases. Section 6 summarizes our conclusions.

2 North American Natural Gas Market Outlook

This section of the report discusses projected natural gas market conditions and impacts of the proposed NEXUS Pipeline on Michigan's gas market. First, we present an overview of ICF's outlook for the North American natural gas market. The North American market has changed dramatically over the past ten years, primarily driven by the growth of new shale gas supplies in the U.S. As these new supplies continue to grow, the market will continue to evolve in response. Second, we focus on the Michigan gas market and the impacts of NEXUS Pipeline, examining the potential shifts in inter-regional pipeline flows and natural gas prices in the context of the constantly evolving North American market.

2.1 North American Natural Gas Supply

With the advent of new shale gas supplies, the North American natural gas market has changed dramatically in the past ten years. Prior to the rise of shale gas, U.S. consumption was increasing more quickly than production, and as a result gas prices were relatively high and volatile. As gas prices increased, investments were made to develop new supplies, such as in coal-bed methane, in building liquefied natural gas (LNG) import terminals, and – most importantly – in new technologies to tap the vast natural gas reserves found in shale formations.

While it had been long known that there were large deposits of gas and oil in shale formations, it was not until the early 2000s that techniques were developed to tap these reserves economically. The new combination of directional drilling and hydraulic fracturing techniques were first applied in the Barnett Shale in north Texas, but quickly spread to other regions. The first successful shale well in the Marcellus Shale (which stretches from West Virginia through Northeastern Pennsylvania) was drilled in 2004, but Marcellus production did not reach significant levels until 2010. Shale gas development has also spread to the Utica Shale, an overlapping play that extends into eastern Ohio. Since 2004, nearly 13,000 wells have been drilled in the Marcellus and Utica shale. In its December 2015 Drilling Productivity Report, EIA estimates that combined production from these two plays reached 19 billion cubic feet per day (Bcfd) by mid-2015.²

Total U.S. and Canadian gas production is currently about 92 Bcfd, meaning that Marcellus/Utica now accounts for about 20% of total North American production (Exhibit 2-1).

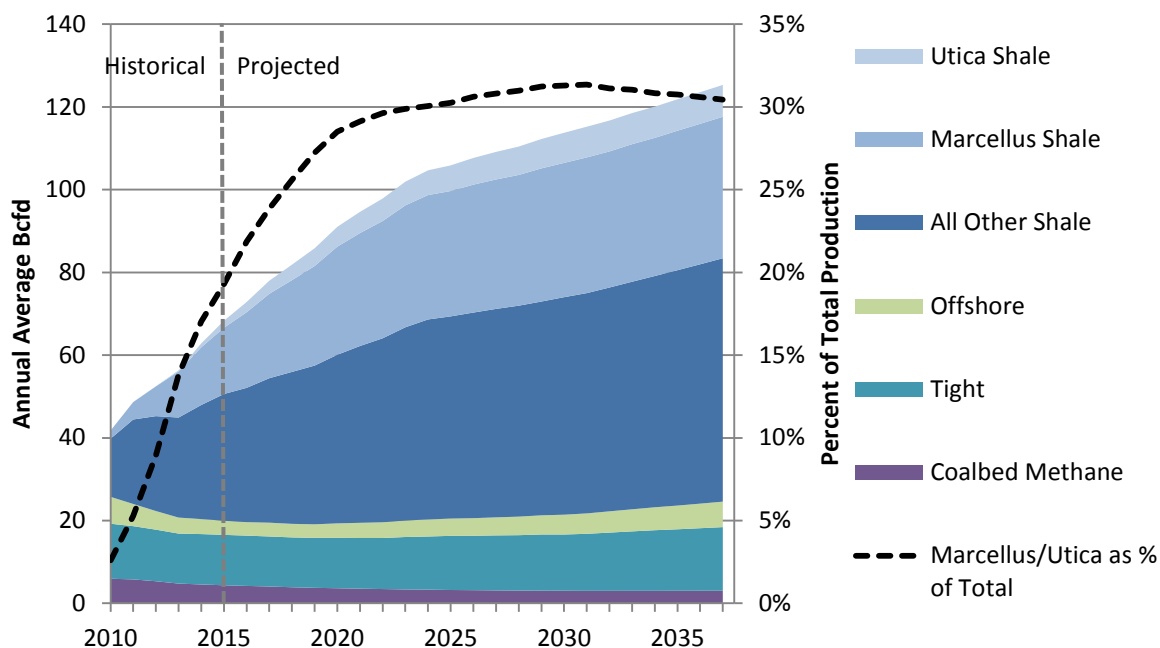
2.2 North American Natural Gas Demand

The rapid growth of Marcellus/Utica production encourages continued growth in gas consumption and exports from North America. Through 2020, growth in North America demand is primarily export-driven (Exhibit 2-2), and the majority of the expected exports are via LNG terminals (Exhibit 2-3). Since 2012, the U.S. DOE has approved applications for LNG exports from nine U.S. LNG terminals; the majority of these facilities are planned for the Gulf Coast, and one terminal (Cheniere's Sabine Pass) is expected to start exporting in early 2016. In Canada, the National Energy Board (NEB) has approved applications for 22

² Drilling Productivity Report, U.S. Energy Information Administration, December 2015.

proposals for export terminals located along the coast of British Columbia. ICF's August 2015 projection assumes total North American LNG exports reach 14.7 Bcfd by 2025, with the majority (11.6 Bcfd) coming from the U.S. Gulf Coast. In addition to LNG, pipeline exports to Mexico have also been increasing to meet growing power generation gas demand. By 2030, ICF projects that pipeline export to Mexico will reach 6.7 Bcfd, or roughly triple the 2014 export volumes.

Exhibit 2-1: U.S. and Canada Natural Gas Production



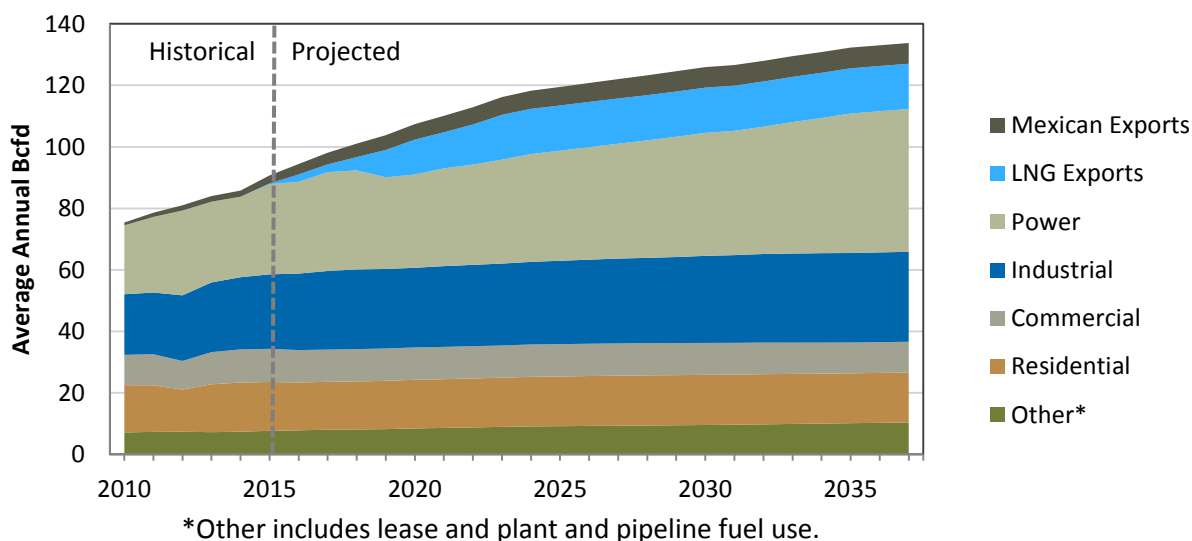
Source: ICF GMM® CPP Case, August 2015

The power generation sector has been, and will continue to be, the major driver of incremental gas consumption within North America. The growth in power sector gas consumption is driven by many factors, including the favorable economics of gas-fired generation, compliance with pre-existing environmental regulation (such as Mercury and Air Toxic Standards), and the regulations of the new Clean Power Plan (CPP), which encourage the retirement of coal plants. By 2037, power sector gas demand is projected to reach 46 Bcfd, or about 35% of total North American demand.

Gas demand is also expected to grow in other sectors, but at a more modest pace. Industrial demand is projected to increase by about 20% through 2037, primarily due to increases in petrochemicals industries which are concentrated on the U.S. Gulf Coast. Residential and commercial gas demands are expected to rise only slightly, as increased demand due to the addition of new gas customers is partially offset by reductions in per-customer consumption due to energy efficiency improvements.

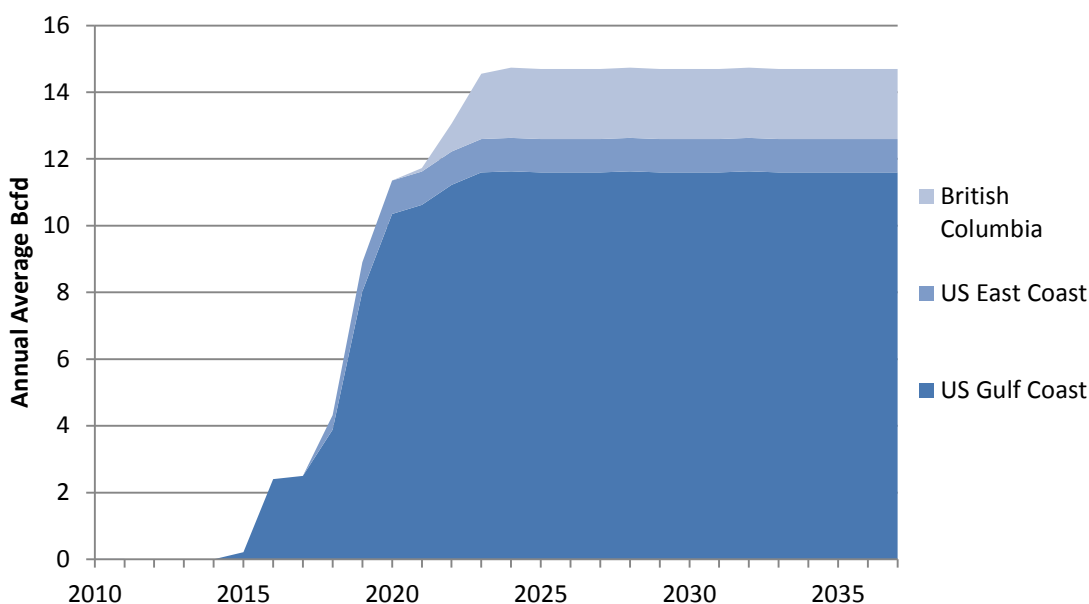
Exhibit 2-4 below shows the regional distribution of gas demand in the United States. The U.S. gas market is expected to grow across all regions, with the largest incremental demand growth in the southern and northeastern markets due to increased gas use in power generation and in the Gulf Coast states, growth in industrial feedstock uses of natural gas by the petrochemical industry. Western markets will see less expansion of gas consumption.

Exhibit 2-2: U.S. and Canada Natural Gas Demand by Sector



Source: ICF GMM® CPP Case, August 2015

Exhibit 2-3: U.S. and Canada LNG Exports



Source: ICF GMM® CPP Case, August 2015

Looking at the East North Central region (Michigan, Ohio, Indiana, Illinois and Wisconsin), our forecast is for gas demand to grow by almost 1.0 Tcf between 2015 and 2035. Current consumption in the region is about 11.3 Bcfd (4.1 Tcf), with ICF forecasting that by 2035 the consumption could reach 14.2 Bcfd (5.2 Tcf). Much of this growth would come from power generation as coal plants are retired and replaced with natural gas-fired generation.

Exhibit 2-4: Regional U.S. Gas Demand Outlook

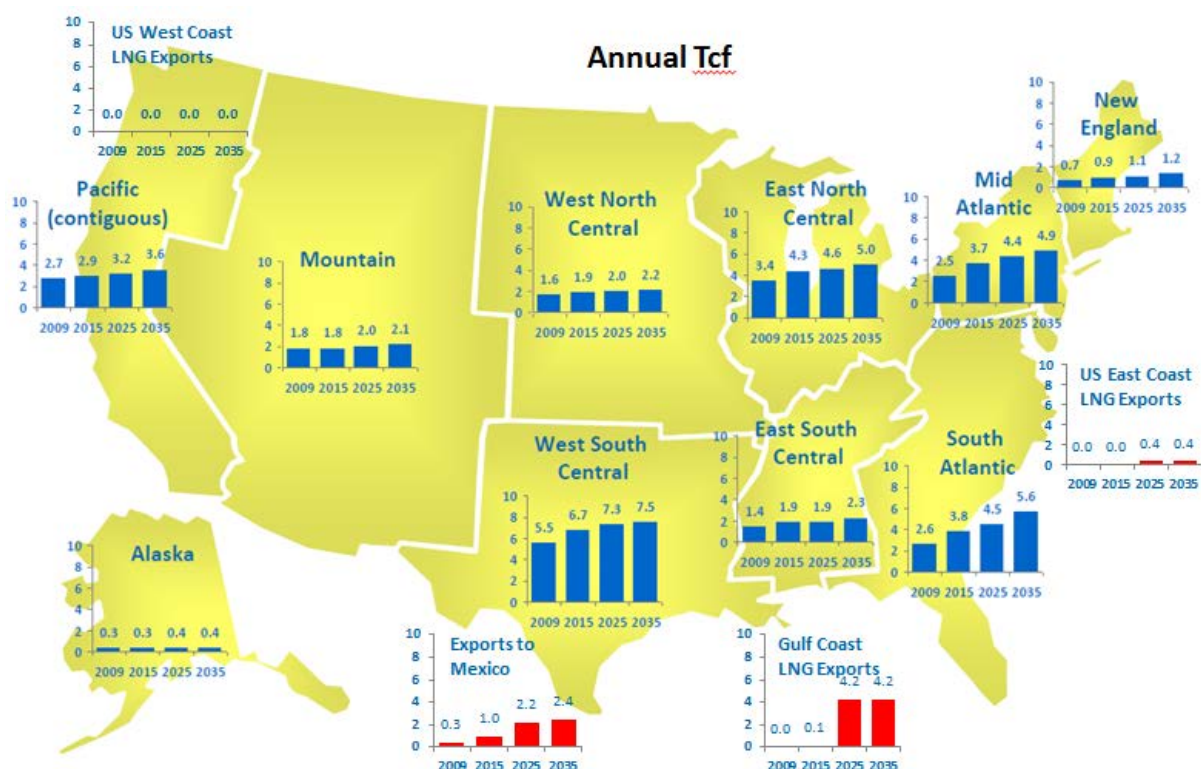
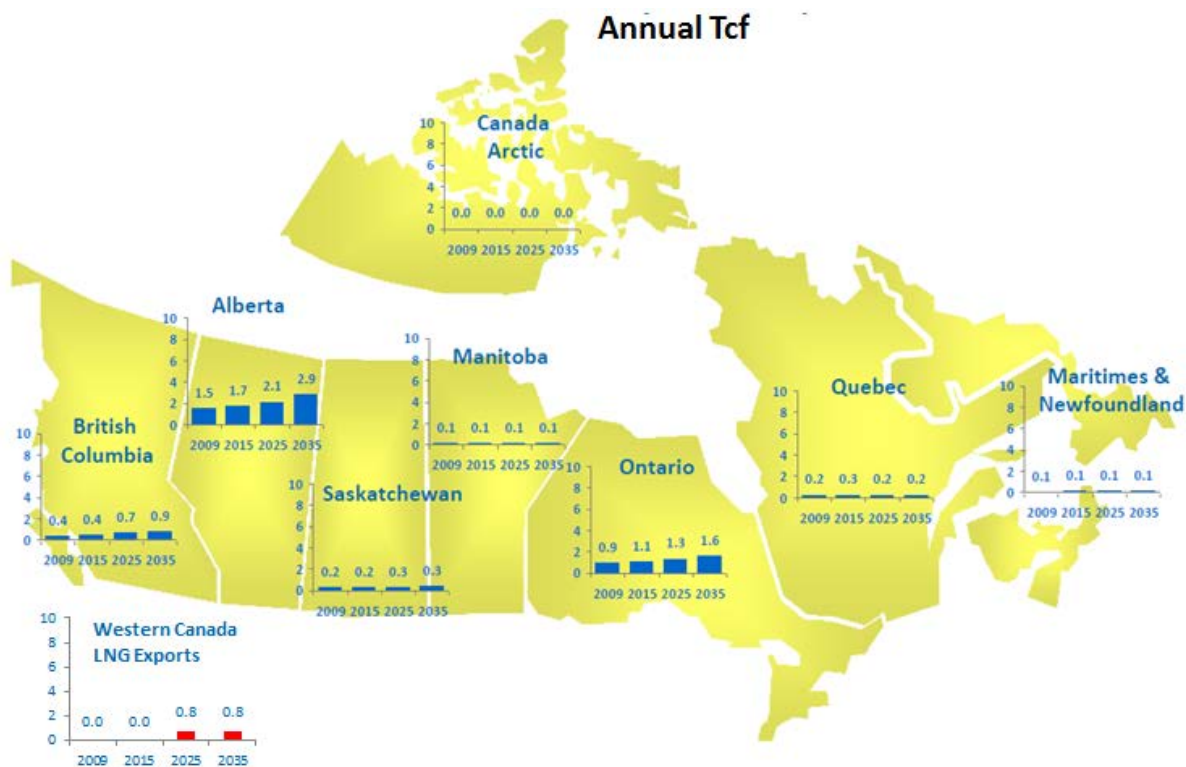


Exhibit 2-5: Regional Canadian Natural Gas Demand



Natural gas demand in western Canada affects Midwest markets due to its impact on natural gas supply available for export from the region. Western Canadian natural gas consumption³ (including LNG exports) is expected to grow from 2.1 Tcf in 2010 to nearly 3.9 Tcf by 2035, driven by growth in LNG exports from British Columbia and oil sands development. With this growth, gas prices in the WCSB are expected to increase, making it more expensive in the distant eastern markets relative to supplies from other regions (e.g., Marcellus).

Most of the projected demand growth in western Canada is in oil sands. While significant development uncertainties persist, ICF expects oil sands production in Alberta to exceed 1.5 billion annual barrels by 2025 and 2.1 billion annual barrels by 2035, which would require over 1.1 Tcf in gas consumption in 2025 (the equivalent of 86 percent of Ontario's annual gas consumption that year), and 1.2 Tcf in natural gas consumption in 2035. This represents an increase of nearly 0.7 Tcf, or 1.8 Bcfd, of natural gas demand between 2013 and 2035. The growth in natural gas demand for oil sands production will significantly reduce natural gas available for export from the WCSB to Ontario and other markets.

The uncertainty about oil sands production centers on oil prices. Low oil prices could reduce production and reduce gas demand. Moreover, oil sands development remains contentious and uncertain due to concerns about climate change impacts, as well as the social and environmental impacts of moving oil sands production to markets outside of Alberta. Lower than anticipated oil sands development and/or lower than anticipated LNG exports from British Columbia could free up natural gas for markets such as Ontario and long-haul shippers, meaning lower toll rates and higher TCPL Mainline gas supply into eastern markets.

2.3 North American Natural Gas Flow Patterns

The shifts in regional gas supply and demand have changed interregional pipeline flow patterns, and the changes are likely to continue in the future. Exhibit 2-6 shows the interregional pipeline flows in 2014, and Exhibit 2-7 shows the flows in 2037 in the ICF CPP Case. Both maps show the United States divided into regions and Canada as a single region. The arrows represent gas flows between the regions, and the table in the lower right shows changes in LNG imports and exports.

Exhibit 2-6 illustrates how Marcellus/Utica production growth has already changed pipeline flow patterns. Prior to the development of Marcellus and Utica, the Mid-Atlantic and Northeast U.S. relied on gas supplies from the Gulf Coast and Western Canada. As of 2014, the Northeast U.S. was a net exporter of gas, as shown by the flows west and south out of Pennsylvania. Exhibit 2-7 shows the continuation of this trend. As Marcellus/Utica production continues to grow, it becomes a major net exporter of gas, and flows along the traditional in-bound paths are increasingly reversed as gas flows out of the region to the South, to the Midwest, and to Eastern Canada.

³ Including gas consumption in British Columbia, Alberta, Saskatchewan, and Manitoba.

Exhibit 2-6: Interregional Pipeline Flows, 2014

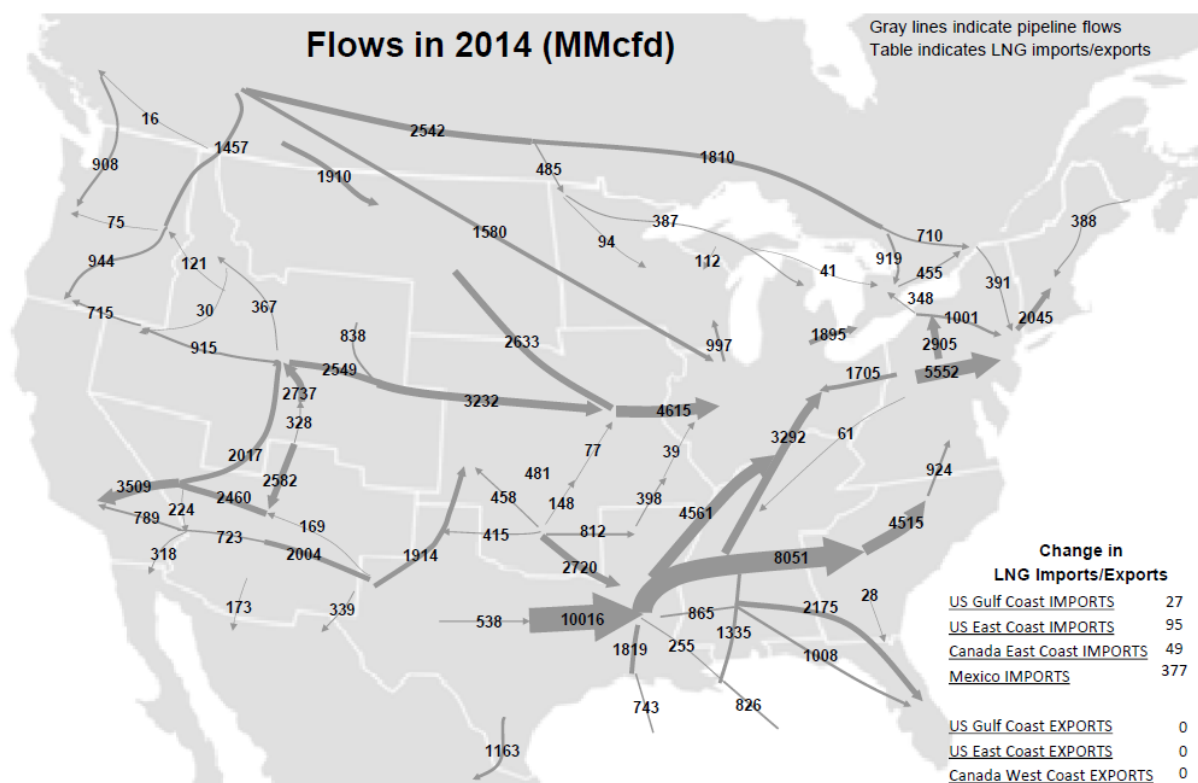
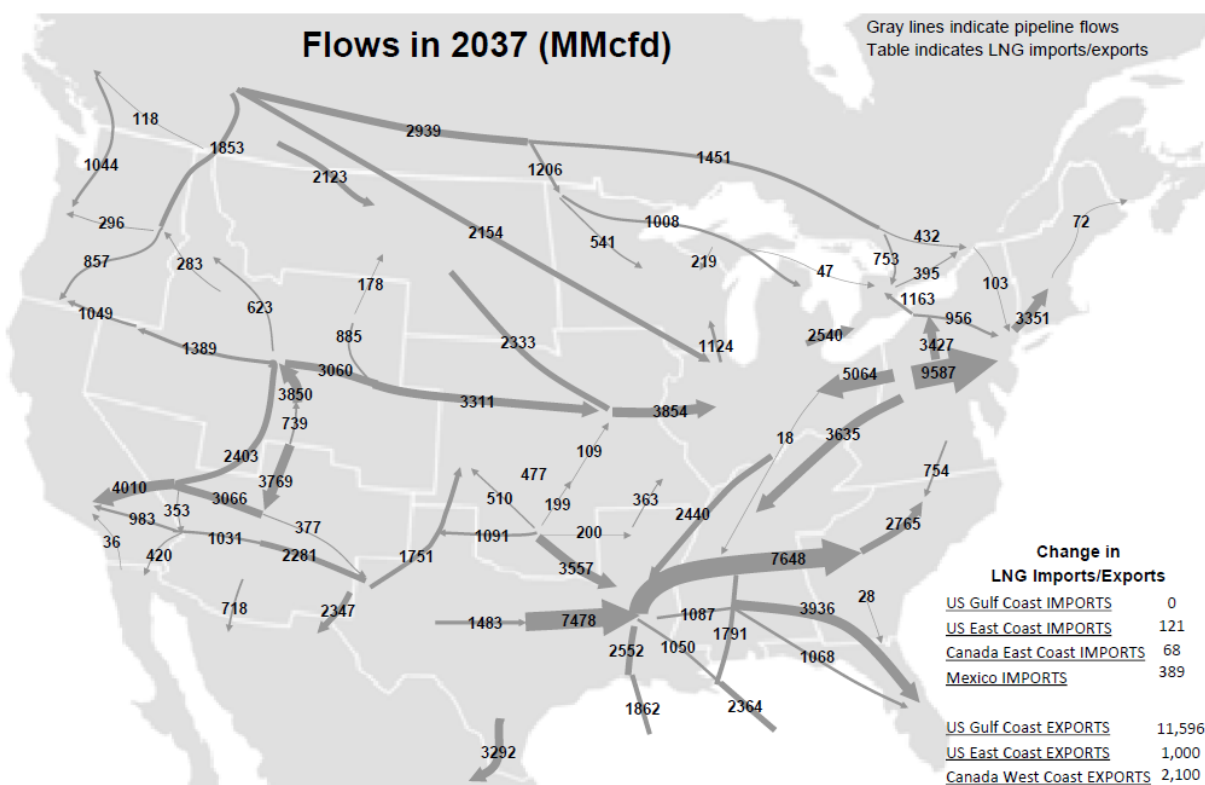


Exhibit 2-7: Projected Interregional Pipeline Flows, 2037



Source: ICF GMM® CPP Case, August 2015

Flows from Western Canada to the east remain low, as consumers in Eastern Canada increasingly rely on Marcellus/Utica supplies. Flows out of Western Canada are also limited by increased gas demand within the region to support LNG exports from British Columbia and oil sands development in Alberta.

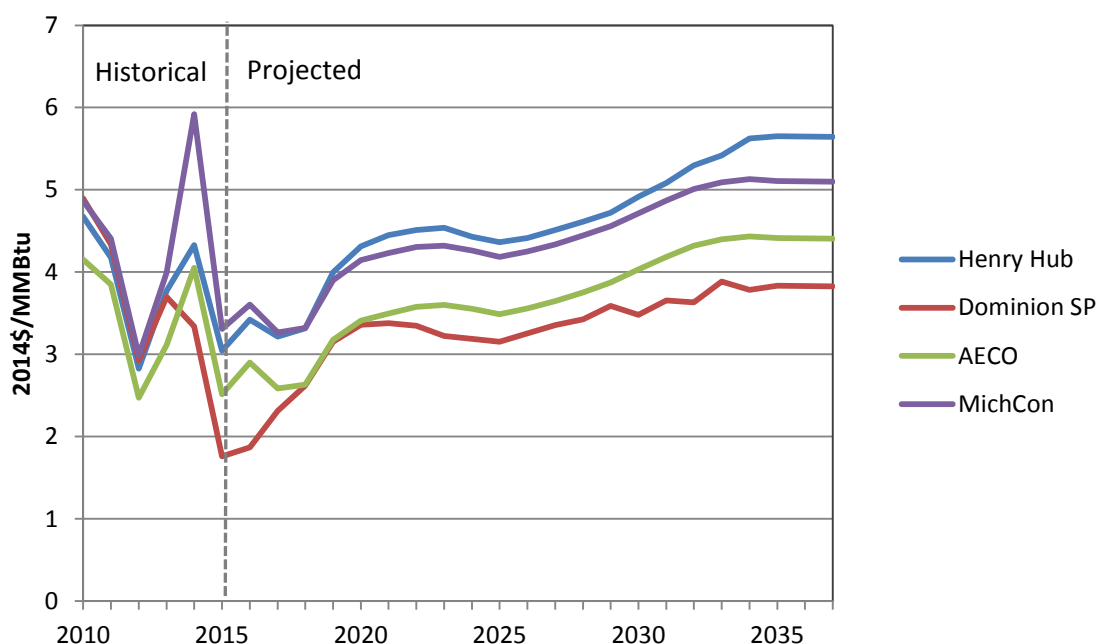
2.4 North American Natural Gas Prices

The changes taking place across North America in natural gas supply and demand will have a fundamental impact on the price relationships between the available sources of natural gas for DTE Gas. Exhibit 2-8 illustrates these impacts.

- The rapid growth in Marcellus/Utica supply is turning the Northeastern U.S. into a major supply center, pushing down prices at major Northeast hubs, including Dominion South Point. (Dominion South Point is the most liquid hub in the Marcellus/Utica area, and is used as a proxy for Marcellus/Utica prices.)
- The concentration of demand growth along the Gulf Coast (from LNG exports, Mexican exports, and industrial demand) is changing the Gulf Coast into a net demand region. Prices at Henry Hub are expected to increase relative to Dominion South Point, which attracts gas from Marcellus/Utica to flow southward.
- In Western Canada, the decline in conventional natural gas production, combined with growth in natural gas demand for oil sands production and LNG exports is expected to lead to higher prices at AECO relative to Marcellus/Utica.

These changes in price relationships increase the attractiveness of natural gas supply purchased from Marcellus/Utica for consumers throughout the Northeastern United States, the Midwest and Central Canada, relative to the supply basins that these regions have historically relied upon.

Exhibit 2-8: GMM Average Annual Prices for Selected Markets

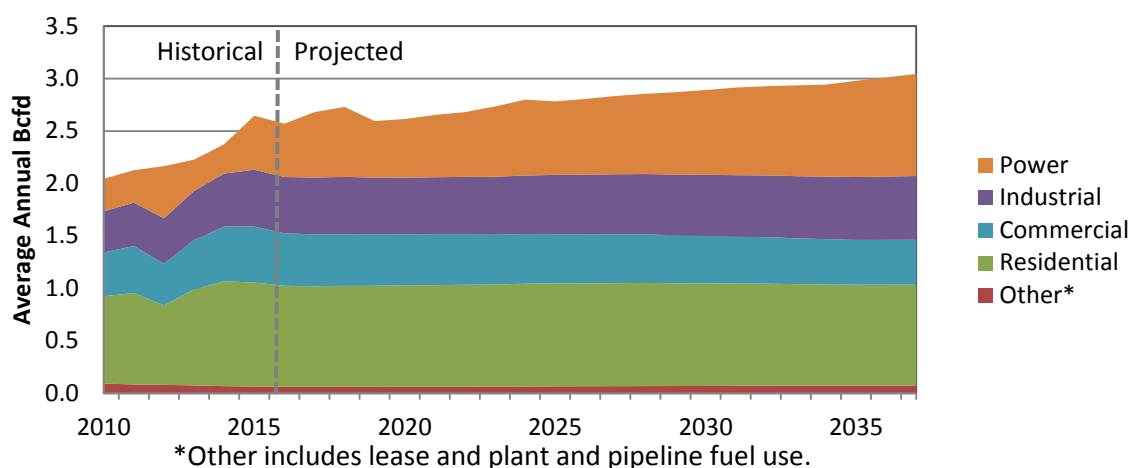


Sources: Platts Gas Daily (historical), ICF GMM® CPP Case, August 2015 (projected)

2.5 The Michigan Natural Gas Market

Prior to the 2008/09 recession, Michigan's total gas demand averaged about 900 Bcf per year, or 2.5 Bcfd. While demand declined in all sectors during the recession, the industrial sector was hardest hit, dropping by over 60% from pre-recession levels. Since the recession, gas demand has risen steadily, reaching 2.4 Bcfd in 2014 (Exhibit 2-9). Historically, the power sector has accounted for about 15% of Michigan's total gas demand, averaging about 0.4 Bcfd over the past 5 year.

Exhibit 2-9: Michigan Natural Gas Demand by Sector

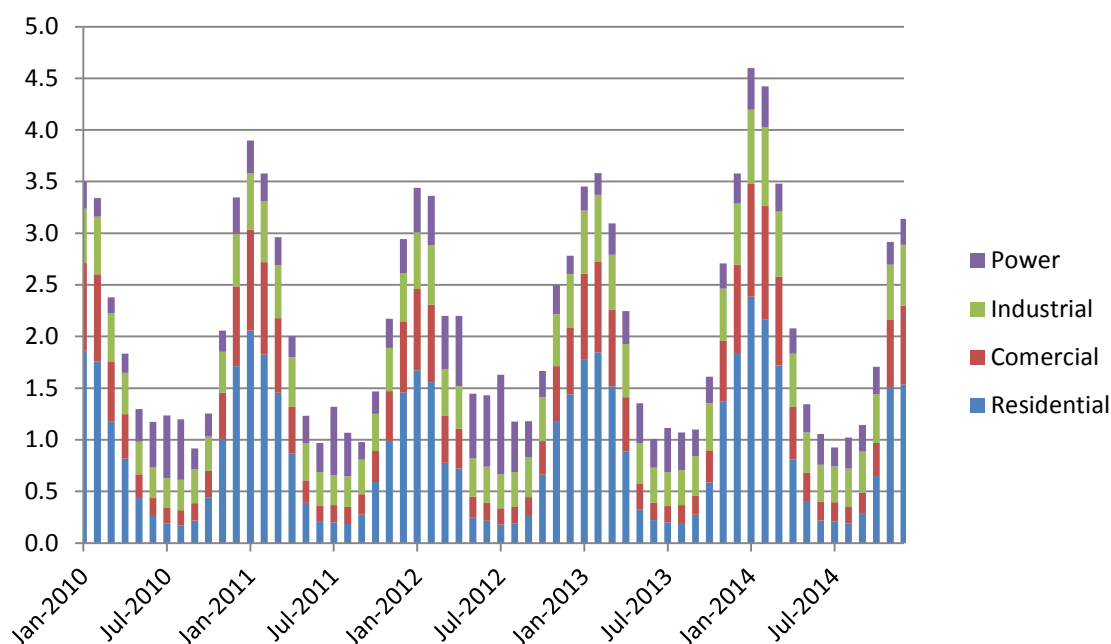


Source: ICF GMM® CPP Case, August 2015

The residential and commercial sectors together account for about 60% of Michigan's total gas consumption. The majority of residential and commercial gas use is for space heating, therefore Michigan gas demand is very seasonal. As shown in Exhibit 2-10, gas demand in the winter months is typically about 2 Bcfd higher than in shoulder and summer months.

During the winter of 2013/14, record cold temperatures resulted in a sharp increase in gas demand, with January 2014 averaging 4.6 Bcfd.

Exhibit 2-10: Michigan Historical Monthly Natural Gas Demand by Sector



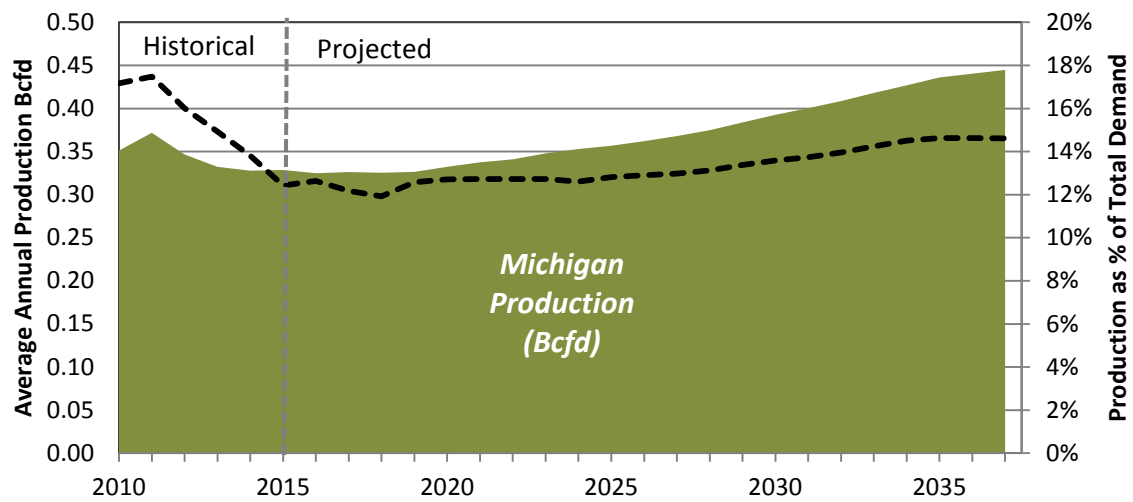
Source: EIA

ICF projects little change in Michigan's residential, commercial, and industrial sector gas demand over the next 20 years, with combined demand from sectors remaining at about 2 Bcfd. However, gas demand in the power sectors is expected to more than double, reaching 1 Bcfd by 2037. Growth in power sector gas demand is primarily driven by environmental policies (including the CPP), which accelerate the retirement of coal-fired generating capacity. (Factors driving gas demand in the power sector are discussed in greater detail in Section 3.3.2).

Gas production in Michigan currently accounts for only about 13% of total demand (Exhibit 2-11). ICF projects Michigan gas production will increase modestly through 2037, but since total gas demand is also increasing (Exhibit 2-9), the share of total demand met by in-state production continues to average about 13%. The remainder of the state's demand must be met by supplies from other regions delivered via interstate pipelines.

The changes in natural gas supply patterns are projected to lead to significant changes in the sources of the natural gas consumed in Michigan. Even without the NEXUS pipeline, Michigan's reliance on Gulf Coast supplies and Mid-Continent supplies is projected to decline substantially in the next five years, largely replaced by an increase in natural gas sourced from the Marcellus and Utica plays. The shift will be accelerated if the NEXUS Pipeline is developed.

Exhibit 2-11: Michigan Natural Gas Production and as a Percent of Demand



Sources: EIA (historical), ICF GMM® CPP Case, August 2015 (projected)

3 Detailed Marcellus and Utica Production and Pipeline Outlook

The proposals to develop new pipeline capacity such as NEXUS from the Marcellus and Utica plays in the Appalachian Basin into the U.S. Midwest markets are a relatively new development. Throughout the early 2000's, natural gas pipeline capacity was developed to transport natural gas from the Rocky Mountains, WCSB, and Mid-continent producing regions into Eastern and Midwestern markets. The Rockies Express Pipeline (REX) from the Rocky Mountains to eastern Ohio was completed in 2010. Expansion of the Vector Pipeline from Chicago into the Detroit and Ontario markets was considered as recently as 2013. Today, in contrast, the pipeline expansion projects under consideration generally flow in the opposite direction to these older projects. The turnabout has been caused by three major changes in North American natural gas markets discussed earlier.

- 1) Production from the Marcellus and Utica plays has increased much faster than anticipated, and today is expected to reach much higher levels than expected as recently as two years ago. The growth in production from these regions has a significant impact on our projections of natural gas flows throughout the Northeastern and Midwestern United States and Central Canada.
- 2) The many LNG import terminals constructed in the Gulf Coast in the early 2000s are being repurposed to export LNG. ICF is projecting significantly more LNG exports from the U.S. Gulf Coast, which impacts the price and availability of alternative sources of natural gas supply available to the U.S. Midwest.
- 3) Flows from western Canada into Ontario and U.S. Midwest markets have declined substantially due to expected growth in demand for WCSB gas to meet local demand and to provide supplies for LNG exports from British Columbia and the U.S. West Coast. ICF forecasts continue this trend.

Of these developments, the most important has been the acceleration of gas production in the Marcellus and Utica shale plays in the Appalachian Basin. Growth in production from these basins is largely responsible for the increase in the LNG export outlook and has displaced gas supplies from the WCSB in Ontario, Quebec, and U.S. Northeast markets.

This section of the report provides a detailed assessment of the supply of gas that would be available to shippers on NEXUS. Because the predominant factor driving market change in North American natural gas markets is the production in the Appalachian Basin, this report focuses first on the broader region, before focusing specifically on the region around the NEXUS receipt point.

3.1 Marcellus and Utica Production Outlook

Since 2007, the Marcellus and Utica in the Appalachian Basin have become the most dominant natural gas plays in North America. Gas production from the area has grown from very low levels in early 2007 to about 19 Bcfd by 2015, roughly 24 percent of the total gas production in the U.S. ICF projects growth in production from these plays to continue to grow at a rate of 2.1 Bcfd per year until 2025, equating to an annual growth rate of about 8.8%.

ICF used a geographic information systems (GIS) modeling approach to assess the resource potential of the Marcellus, Utica, and other gas and liquids plays⁴ in the U.S. Northeast. The ICF resource assessment is based upon geology and reservoir engineering principles. GIS map data layers include depth/structure, thickness, organic content, thermal maturity, and pressure gradient. Gas-in-place is a function of these factors, as well as of porosity and water saturation. Much of the data used for the plays of interest were derived as part of a nationwide shale gas assessment using actual industry map and survey data for parameters. In addition, ICF evaluated well level production data to estimate the volume of reserves related to each well. The trends in this information relate to resource development economics.

Shale plays such as the Marcellus often contain a range of hydrocarbon resources that include oil, wet gas and dry gas. This range is related to thermal maturity, which is mapped in GIS. The model assesses gas- and liquids-in-place for hundreds of six-by-six-square-mile grid cells. The model also uses input assumptions about well productivity and production profiles to estimate recoverable resources (recovery of gas- and oil-in-place). Recovery per well is crosschecked against actual historical horizontal well recovery to "ground-truth" the model.

3.1.1 Resource Estimate

Exhibit 3-1 summarizes the technically recoverable resource base for the plays in this region modeled by ICF. The basic unit on the table is the ICF "subplay," which represents a map division of the play that is deemed significant, or a region showing variability within the play. (Note: In Exhibit 3-1, the categories for Utica and Huron are sample areas of the play and are labeled as A, B, C, etc. These are not true subplays but show some of the variability within the plays.) The most important plays for current and future activity are the Marcellus and the Ohio Utica. A portion of the Utica in New York State has been modeled, but drilling has not been allowed to date. ICF has also modeled the Huron shale play, which is a shallower productivity Devonian shale play above the Marcellus that extends to the southwest of the Marcellus. These plays in total represent over 1,200 Tcf of shale gas recoverable resources, which is more than half of the ICF Lower-48 total. The Marcellus is dominant in the region, with about 700 Tcf of recoverable gas. The ICF subplay division for the Marcellus is shown in Exhibit 3-2. The Ohio Utica has 445 Tcf.

⁴ A play is a group of oil and gas fields or prospects in the same region that are controlled by the same set of geological circumstances. Robert Stoneley (1995). "North Sea petroleum plays". *Introduction to Petroleum Exploration for Non-geologists*. Oxford University Press. P. 106.

Exhibit 3-1: Technically Recoverable Resources by Play from ICF Model

Subplay	MMB Recoverable Crude	Bcf Recoverable Dry Gas	MMB Recoverable Natural Gas Liquids	NGL Ratio Bbls per MMcf
1. Marcellus PA NE Core - Very Dry	0	189,090	3,458	18
2. Marcellus NE PA - NY Other Dry	80	74,183	2,240	30
3. Marcellus PA NW Dry	354	56,968	3,843	67
4. Marcellus Fold Belt Very Dry	0	88,912	1,804	20
5. Marcellus SW Rich Wet	470	13,300	1,616	122
6. Marcellus SW Lean Wet (N)	236	21,881	2,050	94
7. Marcellus SW Lean Wet (S)	408	22,876	2,311	101
8. Marcellus PA SW Dry	0	61,223	1,327	22
9. Marcellus WV Dry	23	160,298	5,703	36
	1,571	688,730	24,351	35
1. OHPAWV Utica - dry gas	17	231,893	5,337	23
2. OHPAWV Utica - oil	6,074	18,465	2,425	131
3. OHPAWV Utica - wet gas	2,979	57,953	5,642	97
4. OHPAWV Utica - very dry gas	0	136,875	2,474	18
	9,070	445,186	15,878	36
1. NY Utica A	0	1,911	33	17
2. NY Utica B	0	6,204	108	17
3. NY Utica C	0	9,088	158	17
4. NY Utica Other	4	39,220	946	24
	4	56,423	1,244	22
Quebec Utica	0	8,996	27	3
Lower Huron - A	113	5,787	1,025	177
Lower Huron - B	47	11,614	1,221	105
Lower Huron - C	3	177	29	165
Lower Huron - Other	126	24,222	2,267	94
	289	41,799	4,541	109
Total of Above	10,934	1,241,135	46,042	37

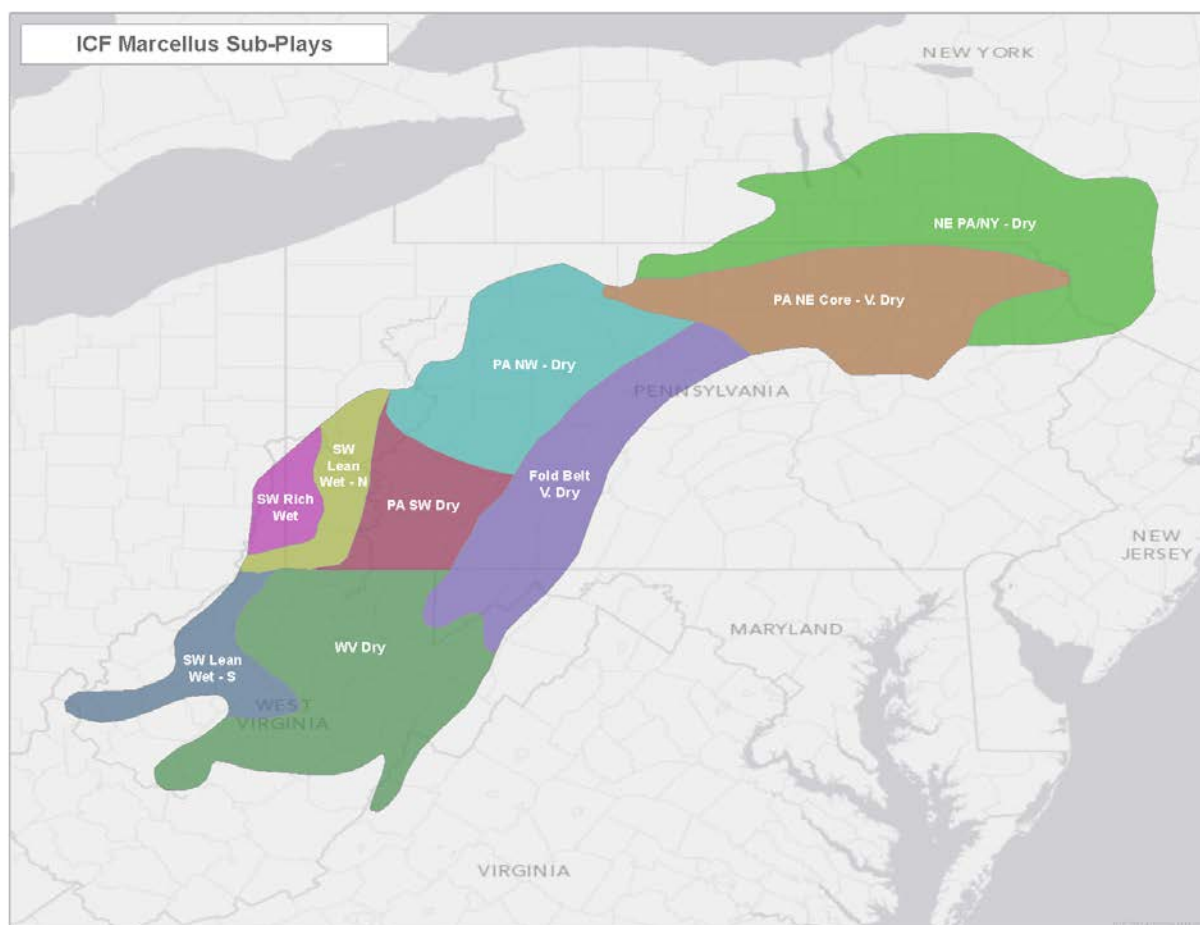
Source: ICF

Marcellus and Utica plays have substantial amounts of natural gas liquids (NGLs) as opposed to crude oil. NGLs total 35 billion barrels in the Marcellus and 36 billion barrels in the OHPAWV Utica. The last column in Exhibit 3-1 shows the ratio of total NGLs to dry gas in terms of barrels per million cubic feet, the "liquids ratio." Several of the subplays containing the greatest volume of gas have the lowest liquids ratios, meaning the gas is drier.

A high percentage of the OHPAWV Utica gas resource base is considered dry. 369 Tcf out of 445 Tcf of recovery is in the dry gas zone. The wet gas window, which is a relatively narrow NE-SW trending map area, includes 58 Tcf of recovery and 5.6 billion barrels of NGLs. As most of the wells to date have been drilled in the wet gas window, less is known about well productivity in the other windows. Thus, well productivity in the full extent of the

dry gas window is somewhat of an uncertainty factor for the Utica. However, very high rates of initial potential have been reported by Consol and others, indicating excellent potential.

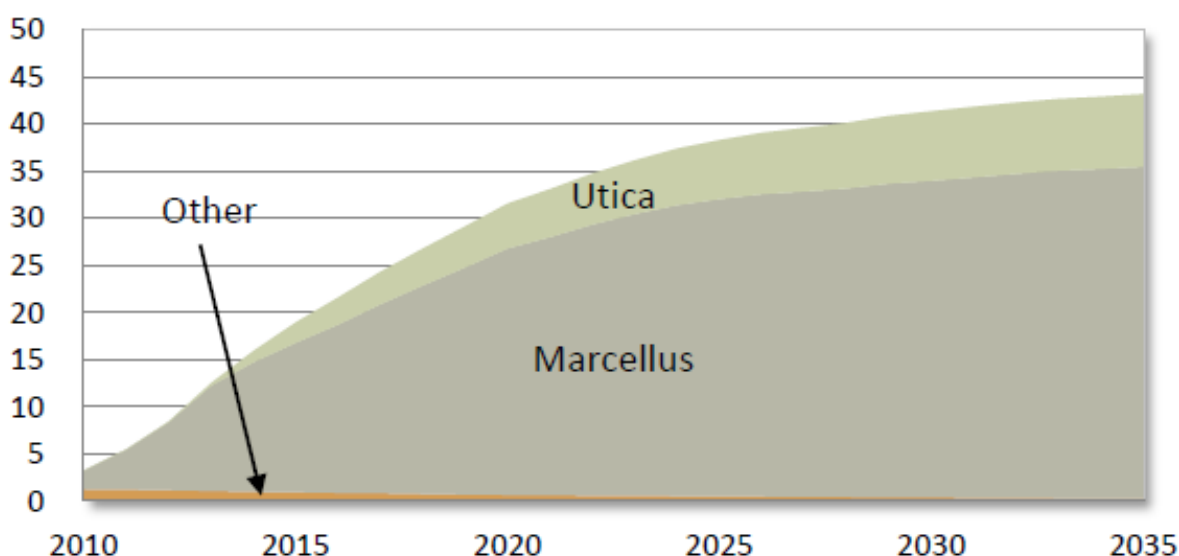
Exhibit 3-2: ICF Subregions in the Marcellus



3.1.2 Production Activity and Outlook for the Marcellus and Utica

As shown in Exhibit 3-3, the Marcellus play dominates our Appalachian Basin gas production forecast through 2035, with production growing from the current 4.9 Tcf (13.3 Bcfd) to 11.4 Tcf (31 Bcfd). Total cumulative Marcellus production during this period is over 200 Tcf, or about one-third of recoverable resources. Utica production in the forecast is expected to increase from about 0.3 Tcf (0.9 Bcfd) currently to 11.4 Tcf (4.9 Bcfd). ICF estimates that approximately 200 Tcf of gas in the Marcellus is producible at prices at and below \$5.00 per MMBtu, with another 20 Tcf producible from the Utica play at those prices.

Exhibit 3-3: Outlook for Natural Gas Production in the Appalachian Basin (Bcf/d)

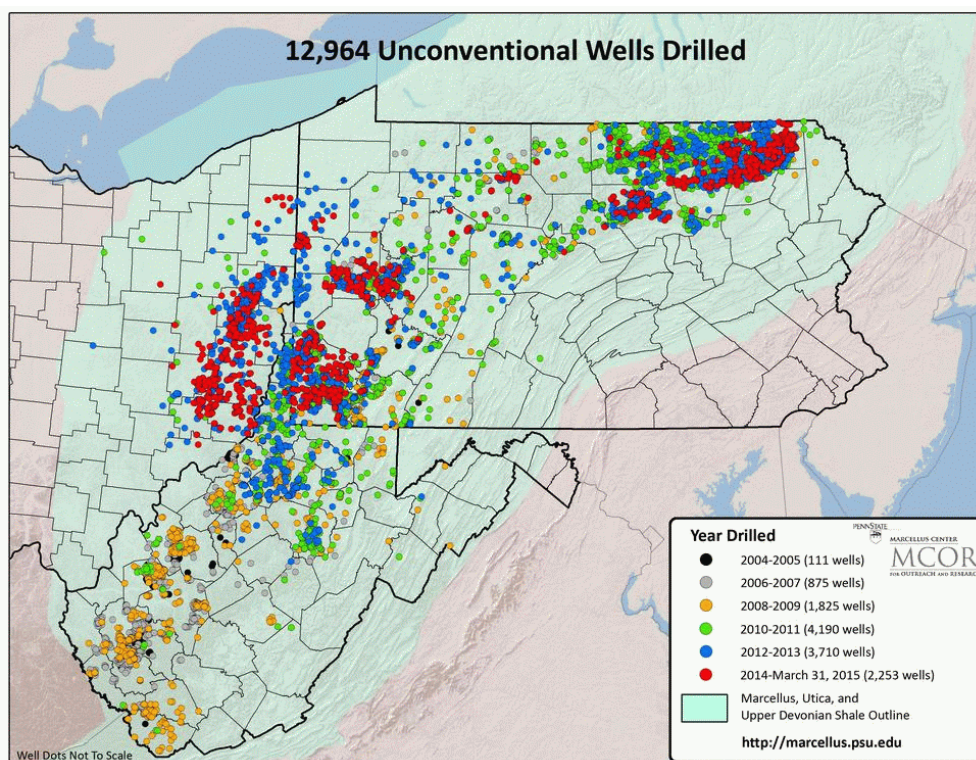


3.2 Marcellus and Utica Exploration and Production Activity

Production growth has been center in the Marcellus/Utica due to the size of the resource (estimated to be well over 1,000 trillion cubic feet) and low per-unit production costs. Exhibit 3-4 shows the areas of permitting and drilling activity in the Marcellus as of March 2015. Recent declines in oil and gas prices have resulted in a slow-down in drilling rig activity across North America, including in the Marcellus/Utica area. Between January and September of 2015, the number of active drilling rigs in the Marcellus and Utica plays declined by 45%.⁵ Despite the decline in rig activity, Marcellus/Utica production has continued to increase due to improvements in well productivity (i.e., more gas produced per well drilled). ICF projects Marcellus/Utica production will reach 42 Bcfd (about 31% of total North American production) by 2037. While other shale plays are also increasing, Marcellus/Utica accounts for over half (55%) of the projected production growth from 2015 through 2037.

⁵ "Gas rigs still at record low: Baker Hughes." Platts Gas Daily, September 8, 2015.

Exhibit 3-4: Marcellus and Utica Shale Drilling Activity, 2004 through March 2015



Source: Pennsylvania State University, Marcellus Center for Outreach and Research

3.3 Pipeline Infrastructure

A major determinant of the production outlook for the Marcellus and Utica is the availability of gas pipeline infrastructure to export gas out of the region. Some areas have been slow to develop because of the lack of transport capacity. In the last three years a large number of pipelines have been proposed to expand out of the Marcellus. A list of these proposals, including projects brought into service in 2015, projects currently under construction, and proposed projects is presented in Exhibit 3-5.

These projects can be divided into four broad categories:

- Local projects (that is, within Marcellus/Utica) to interconnect pipelines, processing plants, and gathering systems.
- Projects that expand existing pipelines or new pipelines to northeastern markets along from New Jersey to New York and New England. These projects will also tie into pipes interconnecting with Canadian pipes at Niagara, Waddington, and other eastern receipt points.
- Projects that will support reversing the traditional long-haul pipeline flows or adding new pipelines to serve southeastern and Gulf Coast markets.
- Projects that will expand pipeline infrastructure towards Chicago and the Midwest, including reaching Dawn in Canada. The NEXUS Pipeline falls within this group.

Exhibit 3-6 summarizes the volumes aimed at the different markets through these pipeline expansions.

Exhibit 3-5: Proposed Pipeline Expansion Projects in the Marcellus/Utica Basin

Natural Gas Pipeline Projects	Company	Origin	Destination	Capacity (MMcfd)	In-Service Date	Status
Northeast Connector Expansion	Williams Transco	York, PA	Queens, NY	100	May-15	In-Service
Rockaway Lateral	Williams Transco	Lower New York Bay, NY	Brooklyn NY	647	May-15	In-Service
Zone-3 East to West Project	Rockies Express Pipeline	Monroe, OH	Moultrie, IL	1,800	Sep-15	In-Service
Virginia Southside Expansion	Williams Transco	Pittsylvania, VA	Brunswick, VA	270	Sep-15	In-Service
Uniontown to CityGas	Texas Eastern Transmission	Greene, PA	Grant, IN	425	Sep-15	In-Service
West Side Expansion	National Fuel	Washington, PA	Beaver, PA	175	Oct-15	In-Service
East Side Expansion	Columbia Gas Transmission	Harford, MD	Orange, NY	312	Oct-15	In-Service
Ohio Pipeline Energy Network (OPEN)	Texas Eastern Transmission	Columbiana, OH	Monroe, OH	550	Nov-15	In-Service
Northern Access 2015	National Fuel	Cattaraugus, NY	Cattaraugus, NY	140	Nov-15	In-Service
Broad Run Flexibility Project	Tennessee Gas Pipeline	Broad Run Lateral, WV	Broad Run Lateral, WV	590	Nov-15	In-Service
Leidy Southeast	Williams Transco	Leidy, PA	Choctaw, AL	525	Dec-15	Partial In-Service
Ohio-Louisiana Access Project	Texas Eastern Transmission	Lebanon, OH	Louisiana	760	Jun-16	FERC Approved
Wright Interconnect Expansion	Iroquois Gas Transmission	Scholarie, NY	Scholarie, NY	650	Nov-16	Under Construction
Constitution	Williams/Cabot/Piedmont	Susquehanna, PA	Scholaries, NY	650	Nov-16	Under Construction
Central Tioga Country	Empire Pipeline	Tioga, PA	Tioga, PA	250	Nov-16	Announced
Clarrington Project	Dominion Transmission	Marshall, WV	Monroe, OH	250	Nov-16	FERC Approved
AIM Project	Algonquin Gas Transmission	Rockland, NY	Norfolk, MA	342	Nov-16	Under Construction
Continent to Coast Expansion Project (C2C)	Portland Natural Gas Transmission	Coos, NH	Cumberland, ME	350	Nov-16	Announced
Gulf Markets Expansion Ph. 1	Texas Eastern Transmission	Clarrington, OH	Louisiana	350	Nov-16	FERC Application
Southeast Mainline Reversal Ph. 2	ANR Pipeline	Shelbyville, IN	Eunice, LA	750	Dec-16	Under Construction
South to North (SoNo)	Iroquois Gas Transmission	Brookfield, CT	Waddington, NY	650	Dec-16	Announced
Rover Pipeline Ph. 1	Energy Transfer	PA, WV, OH	Defiance, OH	2,200	Dec-16	FERC Application
Northern Supply Access	Texas Eastern Transmission	Lebanon, OH	Texas (multiple delivery points)	384	Apr-17	FERC Approved
Rover Pipeline Ph. 2	Energy Transfer	Defiance, OH	Sarnia, ON	1,050	Jun-17	FERC Application
Atlantic Sunrise	Williams Transco	PA	AL	1,700	Jul-17	FERC Application
Gulf Markets Expansion Ph. 2	Texas Eastern Transmission	Clarrington, OH	Louisiana	300	Aug-17	FERC Application
NEXUS Gas Transmission	Spectra Energy	Stark, OH	IN, MI, Ontario	1,500	Nov-17	FERC Pre-Filing
Leach Xpress	Columbia Gas Transmission	Marshall, WV	Leach, KY	1,500	Nov-17	FERC Application
Rayne Xpress	Columbia Gas Transmission	Leach, KY	Rayne, LA	621	Nov-17	FERC Application
TGP 200 Line Looping	Tennessee Gas Pipeline	Wright, NY	Mendon, MA	1,000	Nov-17	FERC Pre-Filing
Broad Run Expansion Project	Tennessee Gas Pipeline	Broad Run Lateral, WV	Broad Run Lateral, WV	200	Nov-17	FERC Application
Atlantic Bridge	Algonquin Gas Transmission	Bergen, NJ	Maritimes, CAN	150	Nov-17	Announced
Northeast Energy Direct (NED)	Tennessee Gas Pipeline	Wright, NY	Dracut, MA	2,500	Nov-18	FERC Application

Source: ICF International, compiled from various public announcements.

Exhibit 3-6: Summary of Proposed Pipeline Expansion Projects from Marcellus/Utica Basin

Destination Market	Proposed Capacity (Bcfd)
Gulf Coast	5.4
Midwest / Ontario	7.0
Northeast	5.4
Mid & South Atlantic	7.4
Western NY / Ontario	2.1

Source: ICF International, compiled from various public announcements.

As these facilities are constructed and Marcellus and Utica production gains better access to the broader gas market, gas prices in the Marcellus/Utica area are expected to increase, relative to Henry Hub. Basis spreads between Marcellus/Utica and other markets will better reflect the cost of pipeline transportation than the effects of constraints in takeaway capacity as is now the case. The driving feature behind the NEXUS Pipeline, as well as other pipelines being proposed from this region, is the superabundance of supply seeking markets.

4 NEXUS Pipeline

The proposed NEXUS Gas Transmission (NEXUS) project is designed to transport 1.5 Dth/d of natural gas from the Appalachian basin, including shale gas from the Marcellus and Utica from Eastern Ohio to markets in Northern Ohio, Michigan, , and Ontario. The project will consist of a newly-constructed Greenfield Pipeline that will extend approximately 250 miles from receipt points in eastern Ohio to interconnect with the existing pipeline grid in southeastern Michigan. As proposed, the path will utilize both existing and expansion capacity on the DTE Gas transportation system and the Vector Pipeline (Vector) System to access Chicago and the Dawn Hub.

The project is being developed by NEXUS Gas Transmission, LLC (NEXUS), which is jointly owned by affiliates of Spectra Energy Partners and DTE Energy Company.

NEXUS Gas Transmission applied to FERC for leave to construct the pipeline on November 20, 2015. According to the application:

“NEXUS has entered into definitive agreements with seven shippers, which together combine for a commitment of firm capacity of 835,000 Dth/d. The target in-service date on the Project facilities is November 1, 2017.”⁶

The route for the Nexus pipeline is shown in Exhibit 4-1.

Exhibit 4-1: Nexus Gas Transmission System



Source: NEXUS Gas Transmission

⁶ NEXUS Gas Transmission, “NEXUS Gas Transmission Project: FERC Section 7(c) Application Volume 1”, November 2015, Page 2.

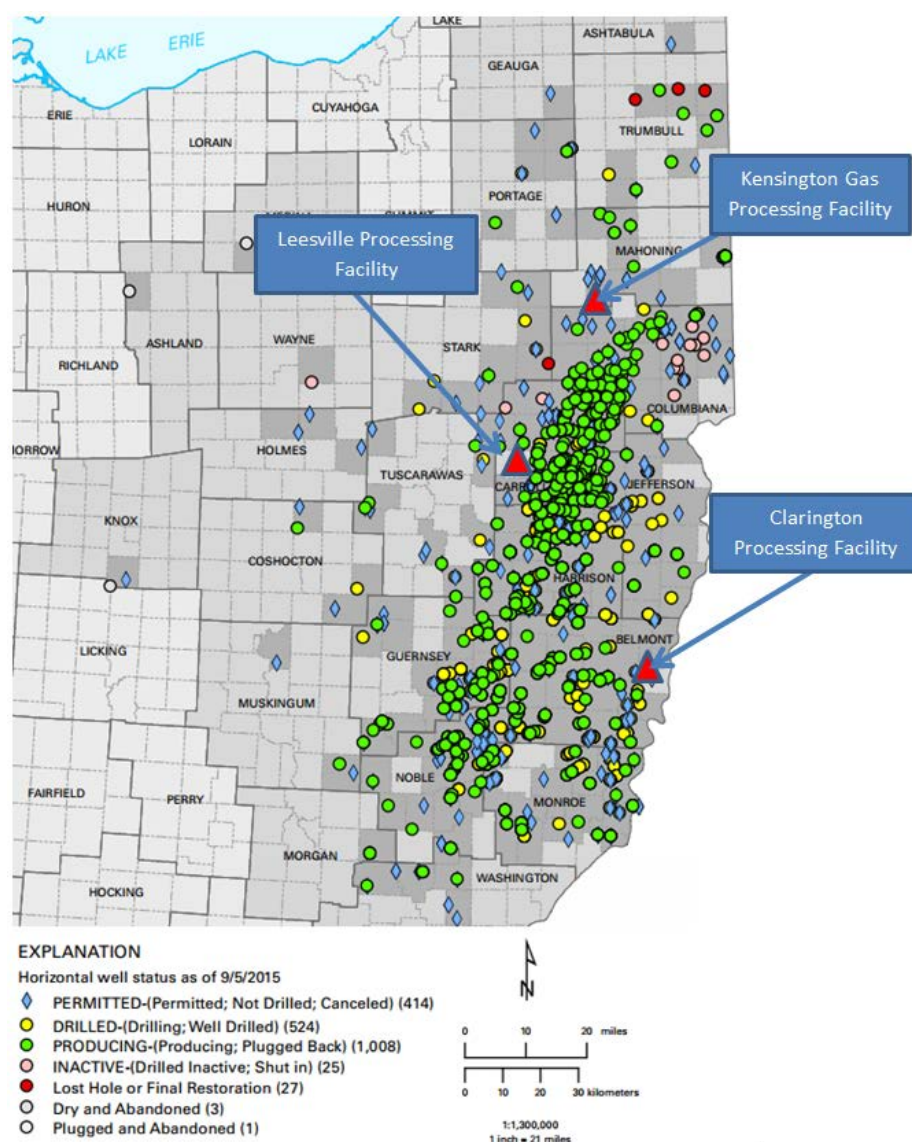
4.1 Availability of Natural Gas Supply at the NEXUS Receipt Point

The NEXUS Pipeline receipt point at Kensington is located in a prolific producing region in the Utica shale play. Exhibit 4-2 shows the rig activity for the Ohio Utica, in the area proximate to the NEXUS pipeline as of September 2015. Producing Utica wells are shown in green, while permits are shown in blue. Drilled but not yet producing wells are shown in yellow. As of September 2015, there were 1,141 producing Ohio Utica wells with an average third quarter overall play production rate of 2,672 MMcfd and 62,060 b/d. The average rate per well during the quarter was 2.3 MMcfd and 54 bbls of condensate. A small number of more recently completed wells averaged over 15 MMcfd per well during the quarter.

When Utica production began to expand rapidly in 2012, the lack of sufficient processing and pipeline capacity in the region initially constrained growth. New pipelines and processing capacity have aided production growth, and additional planned gas infrastructure will help continue this trend. Data published by the Ohio Department of Natural Resources show that over the past year, natural gas production increased from 976 MMcfd (Q2 2014) to 2,438 MMcfd (Q2 2015) and 2,672 MMcfd (Q3 2015).⁷

⁷ Ohio Department of Natural Resources. <http://oilandgas.ohiodnr.gov/production> accessed September 10, 2015.

Exhibit 4-2: Ohio Drilling Activity as of September 2015



Source: Ohio Department of Natural Resources

The Kensington gas plant is part of the Utica East Ohio Midstream Buckeye (Buckeye) project. The Buckeye project (owned by Access Midstream, M3 Midstream and EV Energy Partners), includes a major gas gathering system ranging from the Kensington facility in the Northeast down to the Harrison Hub in Harrison County, Ohio and the Leesville Plant in Carroll County, Ohio.

There are currently a number of announced projects in the region to increase gathering and processing capacity, and to interconnect the existing pipelines in the region. The Spectra Ohio Pipeline Energy Network (OPEN) project will add 550,000 Dth per day of pipeline capacity along a 75 mile corridor through the Utica production region from the Tennessee Gas Pipeline near the Kensington plant to the Texas Eastern system in Western Pennsylvania as soon as September 2015.⁸ Blue Racer, which is a partnership between Dominion and Caiman Energy, is also building out an extensive gathering and processing

⁸ "OPEN project eyes mid-September startup." Platts Gas Daily, September 10, 2015.

facility in the region. Additional gathering, processing and pipeline interconnect projects are expected to be announced as production and demand increase.

This region is also well connected with the Marcellus producing regions in Southwest Pennsylvania and Eastern Ohio. NEXUS will include receipt point interconnects with several major interstate pipelines traversing the region, including the Texas Eastern and Tennessee Gas Pipelines. The capacity of the Texas Eastern system in this area is about 2,875 MMcf/d, while the capacity of the Tennessee Gas Pipeline in this area is about 1,025 MMcf/d⁹. Interconnects with Texas Eastern and Tennessee Gas Pipelines increase market liquidity and provide additional security of supply for NEXUS receipts.

The ultimate amount of natural gas produced and processed in this area of the Utica will depend on the amount of pipeline take-away capacity from the region. That is to say, the gas reserves in the region are abundant but underdeveloped. As additional pipeline capacity is constructed to provide access to markets, production from the region will continue to increase. The natural gas gathering and processing facilities needed to fill the pipeline capacity will be developed in conjunction with the pipeline take-away capacity.

4.2 Processing and Pipeline Capacity near the Nexus Receipt Point

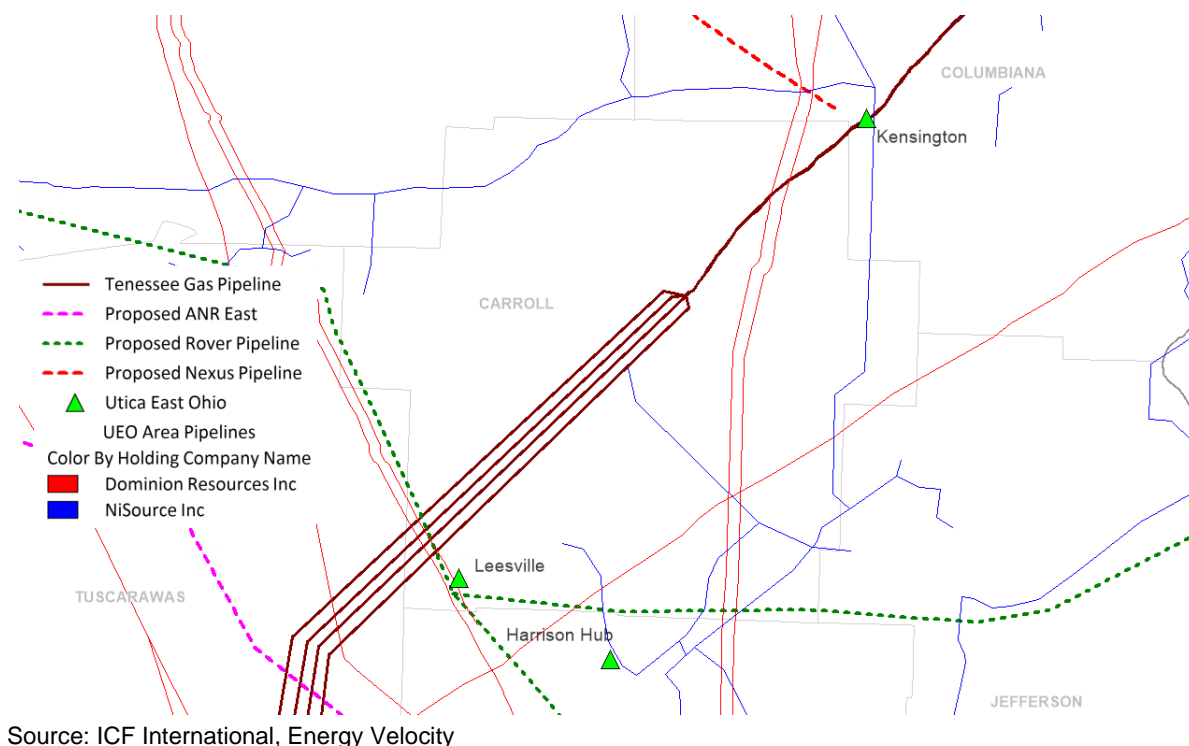
The receipt point for the NEXUS Pipeline will be at Kensington Ohio. The Kensington, Ohio gas processing plant, located in Columbiana County, was constructed to process the liquids-rich natural gas originating in the Southwest Marcellus and Utica shales. It was constructed, and is currently operated, by M3 Midstream LLC. In addition, Access Midstream (a Williams' subsidiary) and EV Energy provided financing and associated facilities as joint owners of the processing plant.

The Kensington processing facility is part of the larger Utica East Ohio (UEO) project (see Exhibit 4-3). The Utica East Ohio project consists of major gas processing facilities at the Kensington plant and at Leesville, as well as 135,000 barrels per day (bpd) in fractionation capacity at Harrison Hub.¹⁰

⁹ Source: PointLogic Pipeline Database.

¹⁰ Williams Press Release; "Williams Partners Completes Acquisition of Additional Interest in Utica East Ohio Midstream Partnership"; June 10, 2015. <http://investor.williams.com/press-release/williams/williams-partners-completes-acquisition-additional-interest-utica-east-ohio-m>

Exhibit 4-3: Utica East Ohio System Overview with Area Pipelines



The Kensington processing facility has a current nameplate capacity of 600 MMcfd¹¹ via three processing trains, with expansion capabilities that could bring the total nameplate capacity to 800 MMcfd. Effective processing capacity is expected to be at least 10 percent higher than nameplate capacity, leading to a current effective processing capacity of more than 660 MMcfd, with the capability of expanding to more than 880 MMcfd. Kensington currently has the ability to deliver gas into two major interstate gas pipelines, the Tennessee Gas Pipeline and Texas Eastern Transmission, via the recently completed Ohio Pipeline Energy Network (OPEN) system. In addition, Kensington has the ability to deliver into the Ohio intrastate pipeline system, the Dominion East Ohio system, and eventually the NEXUS pipeline. When looking at recent monthly average deliveries into the Tennessee Gas Pipeline from Kensington, volumes exceed 660 MMcfd starting in March 2015, which suggests that existing processing capacity may exceed even the 660 MMcfd estimated effective capacity.

Located at the north end of the UEO system, the Kensington facility is connected with the Harrison Hub Fractionation plant and the Leesville processing plant by UEO gathering lines. The Leesville plant has a current nameplate processing capacity of 200 MMcfd, with an effective processing capacity of more than 220 MMcfd. Announced expansion projects are expected to increase the nameplate production capacity to 400 MMcfd, with an effective processing capacity of more than 440 MMcfd.

There are additional interconnects at the Leesville processing plant with Dominion Transmission and with the Tennessee Gas Pipeline, which has a takeaway capacity of 408

¹¹ Published reports on current total gas processing capacity at Kensington range from 600 MMcfd (Oil and Gas Journal June 1, 2015) to 800 MMcfd (multiple press reports). Williams investor briefings place the nameplate capacity at 600 MMcfd.

MMcfd. Dedicated liquids lines run from Kensington to Harrison Hub, where they interconnect with the Enterprise TE Products line. Additional gathering lines in the UEO area are operated by BlueRacer Midstream and Cardinal Gas Services, an affiliate of UEO's parent company Access Midstream.

Overall, the Utica East Ohio System currently has a total nameplate gas processing capacity of 800 MMcfd, with an effective gas processing capacity of more than 880 MMcfd. After current expansion projects are completed, the nameplate capacity of the Utica East Ohio system will reach 1,000 MMcfd, with an effective capacity of more than 1,100 MMcfd. The system has been designed to add at least one additional processing train at Kensington, which will increase nameplate capacity to 1,200 MMcfd, with an effective processing capacity of more than 1,320 MMcfd. Additional processing trains may be added in the future.

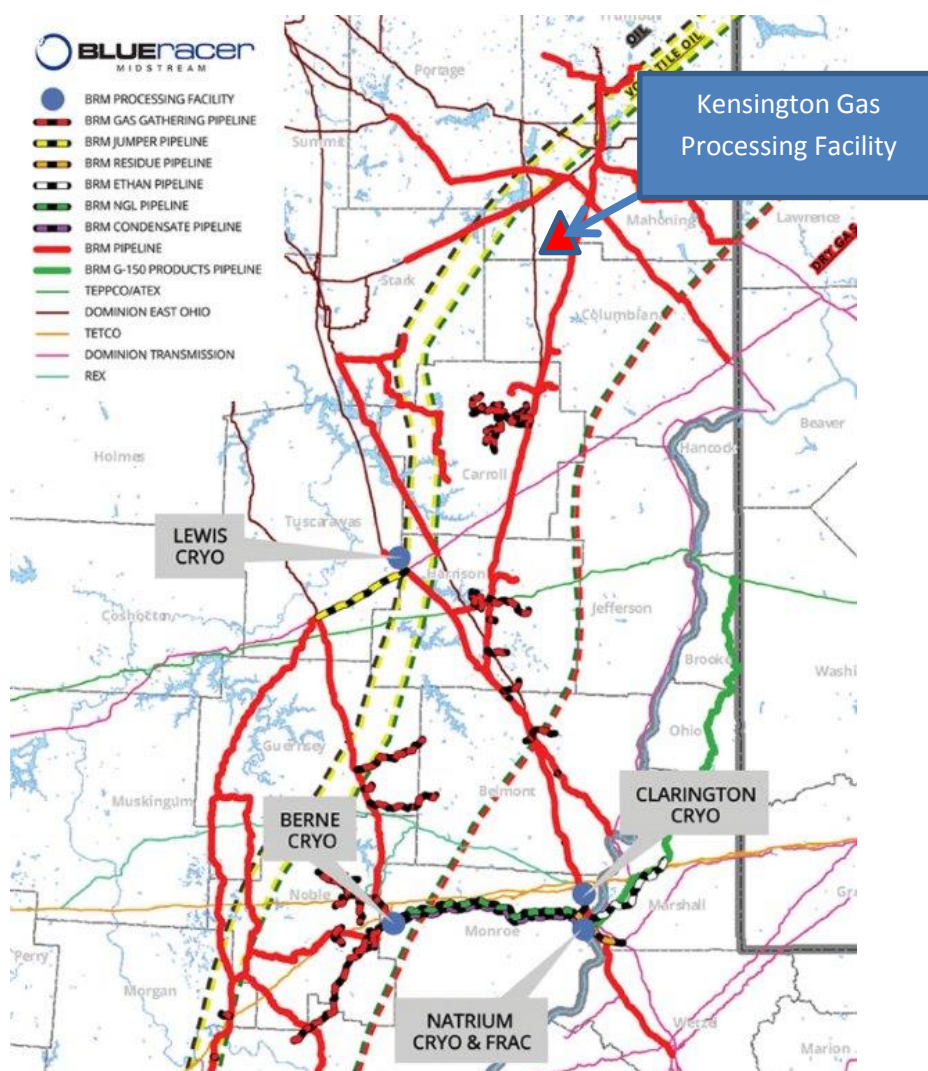
There are currently a number of announced projects in the region to increase gathering and processing capacity, and to interconnect the existing pipelines in the region. The Spectra Ohio Pipeline Energy Network (OPEN) project will add 550,000 Dth per day of pipeline capacity along a 75 mile corridor through the Utica production region from the Tennessee Gas Pipeline near the Kensington plant to the Texas Eastern system in Western Pennsylvania by the end of 2015. Blue Racer, which is a partnership between Dominion and Caiman Energy is also building out an extensive gathering and processing facility in the region (Exhibit 4-5). Additional gathering, processing and pipeline interconnect projects are expected to be announced as production and demand increase.

This region is also well connected with the Marcellus producing regions in Southwest Pennsylvania and Eastern Ohio. NEXUS will include receipt point interconnects with several major pipelines traversing the region, including the Texas Eastern and Tennessee Gas Pipelines. The capacity of the Texas Eastern system in this area is about 2,875 MMcf/d, while the capacity of the Tennessee Gas Pipeline in this area is about 1,025 MMcf/d¹². The interconnects with Texas Eastern and Tennessee Gas Pipelines increase market liquidity and provide additional security of supply for NEXUS receipts.

Based on existing capacity and proposed additions, ICF projects there will be sufficient physical gas availability at the Kensington facility and at the nearby Harrison Hub and Leesville facility to meet Nexus shippers' potential needs for gas supplies from the region. The ultimate amount of natural gas produced and processed in this area of the Utica will depend on the amount of pipeline take-away capacity from the region. That is to say, the gas reserves in the region are abundant but underdeveloped. Once sufficient pipeline capacity is constructed to provide access to markets, production from the region will increase. The natural gas gathering and processing facilities needed to fill the pipeline capacity will be developed in conjunction with the pipeline take-away capacity.

¹² Source: Lippman Consulting Services Pipeline Database.

Exhibit 4-4: Blue Racer Asset Map



Source: Blue Racer

4.3 Natural Gas Pricing at the NEXUS Receipt Point

The NEXUS pipeline will establish a new natural gas pricing dynamic around the pipeline receipt point(s) once the pipeline is in place. In addition, the pipeline will provide market access for a rapidly growing region of the Appalachian Basin, including significant production from the Utica shales. As a result, currently there is no direct market proxy for pricing NEXUS pipeline receipts, since Kensington is not a market hub. ICF has used the projected Dominion Southpoint price as the closest and most direct liquid market center to the NEXUS receipt point. Dominion Southpoint is the largest and most liquid market center in the region, and includes segments of the Dominion system in near proximity to the Kensington gas plant.

Platt's determines the Dominion South Point index price based on reported transactions within the region defined as:

“Deliveries into two Dominion Transmission main lines: One runs northeast from Warren County, Ohio, midway between Cincinnati and Dayton, and merges with the second line just northeast of Pittsburgh, PA. The second line runs from Buchanan County, VA., on the Virginia/West Virginia border north to the end of the zone at Valley Gate in Armstrong County, PA. Major stations in the South Point system include interconnections with ANR Pipeline (Lebanon station), Columbia Gas Transmission (Windbridge and Loudoun stations), Tennessee Gas Pipeline (Cornwell station), Transcontinental Gas Pipe Line (Nokesville station) and Texas Eastern Transmission (Lebanon, Oakford, Chambersburg, Perulack and Windridge stations). Storage pools in the South Point system include South Bend, Murrysville, Oakford, Gamble, Hayden, Webster, Colvin, North Summit, Bridgeport, Lost Creek, Kennedy, Fink and Rocket Newberne.”¹³

While natural gas production in the immediate region of the NEXUS receipt point is expected to continue to increase, we expect this region of Ohio and the Utica shales to maintain a price premium relative to Southwest Pennsylvania markets in and around Dominion Southpoint in the near term. The price premium is estimated to be about \$0.12 to \$0.14 per Dth, representing \$0.10 per Dth in transportation, plus 0.5% fuel and other variable costs associated with delivering gas into the NEXUS pipeline. Over time, the premium should fall as more gas is produced in the Utica and the Kensington receipt points see more deliveries and trading. Kensington could begin to trade at a discount to Dominion Southpoint with more local production and reflect prices that are tied more closely with Dawn and DTE Gas' service territory.

4.4 Role of the DTE Gas Commitment to Advancing NEXUS

In December, 2013, DTE Gas entered into a precedent agreement with NEXUS Partnership for 75,000 Dth/day of capacity on the NEXUS system for the fifteen year period from November 2017 through October 2032.

NEXUS Gas Transmission applied to FERC for leave to construct the pipeline on November 20, 2015. According to the application:

“NEXUS has entered into definitive agreements with seven shippers, which together combine for a commitment of firm capacity of 835,000 Dth/d. The target in-service date on the Project facilities is November 1, 2017.”¹⁴

NEXUS is currently active in marketing the remaining 665,000 Dth/d of available firm capacity. Today, NEXUS is anchored by roughly equal commitments from end users in Ohio, Michigan and Ontario and Marcellus/Utica producers. About half of the capacity has been anchored by the commitments from Eastern Canadian and Midwest LDCs, while the remaining half has been anchored by the Appalachian producers.¹⁵

¹³ Platt's "Methodology and Specifications Guide – North American Natural Gas", November 2014, page 10.

¹⁴ NEXUS Gas Transmission, "NEXUS Gas Transmission Project: FERC Section 7(c) Application Volume 1" (NEXUS Application), November 2015, Page 2.

¹⁵ NEXUS Application, page 6.

While it is often difficult to determine whether a specific commitment for pipeline capacity is necessary to ensure construction of the project, the DTE Gas commitment was important to the initial development of the project, and remains important in ensuring that the project is sufficiently contracted to support project development.

5 The Value of Nexus Capacity to DTE Gas' Distribution Customers

In this section, we present our analysis of the effect of NEXUS on gas prices and on DTE Gas' supply portfolio. This analysis has identified three benefits of NEXUS to DTE Gas and its customers:

- 1) Incremental pipeline capacity from the Appalachian Basin into the Midwest, Michigan, and Ontario will lower gas prices relative to what they would be without the additional pipeline capacity into the region. This will benefit all Michigan natural gas consumers, including DTE Gas customers.
- 2) DTE Gas' commitment for 75,000 Dth/day of capacity on NEXUS will allow DTE Gas to re-optimize its gas pipeline capacity and gas supply purchasing portfolios, and reduce delivered gas costs to DTE Gas customers. In purchasing gas over NEXUS, DTE Gas will be able to reduce the total commodity cost of natural gas for system supply. NEXUS provides access to low cost supplies in the Marcellus and Utica basins that would otherwise be unavailable.
- 3) Additional pipeline capacity into and through the DTE Gas service territory will also improve market liquidity and increase overall supply reliability.

These benefits are addressed in more detail below.

5.1 Analytical Approach

To analyze the impacts of the NEXUS Pipeline on natural gas markets, ICF compared four cases developed using the GMM[®] to determine the impact of the NEXUS Pipeline under two different market scenarios, with and without the development of the Rover Pipeline. The four cases were developed with the following assumptions for the Rover and NEXUS expansions:¹⁶

- 1) A "No Pipeline Added" case where both Rover and NEXUS were excluded from forecast pipeline expansions.
- 2) A "Nexus Only" case that includes 1.5 Bcfd of incremental pipeline capacity from the Appalachian Basin into Michigan.
- 3) A "Rover Only" case that includes 3.25 Bcfd of incremental pipeline capacity from the Appalachian Basin into Michigan.
- 4) A "NEXUS and Rover" case that included 4.75 Bcfd of incremental pipeline capacity from the Appalachian Basin into Michigan.

The NEXUS Only" case was compared to the "No Pipeline Added" case to evaluate the impact of NEXUS in the absence of Rover.

¹⁶ The four cases were based on the ICF August 2015 Base Case, including the impact of the Federal Clean Power Plan, and are the same scenarios used by ICF to develop the report "Impact of the NEXUS Pipeline on Michigan Energy Markets, submitted to the Michigan Public Utilities Commission in November 2015 by DTE Electric.

The “Nexus and Rover” case was compared to the “Rover Only” case to evaluate the impact of NEXUS if the Rover Pipeline is also developed.

Other than including or excluding the NEXUS and ROVER expansions, all other assumptions were held constant across the scenarios.

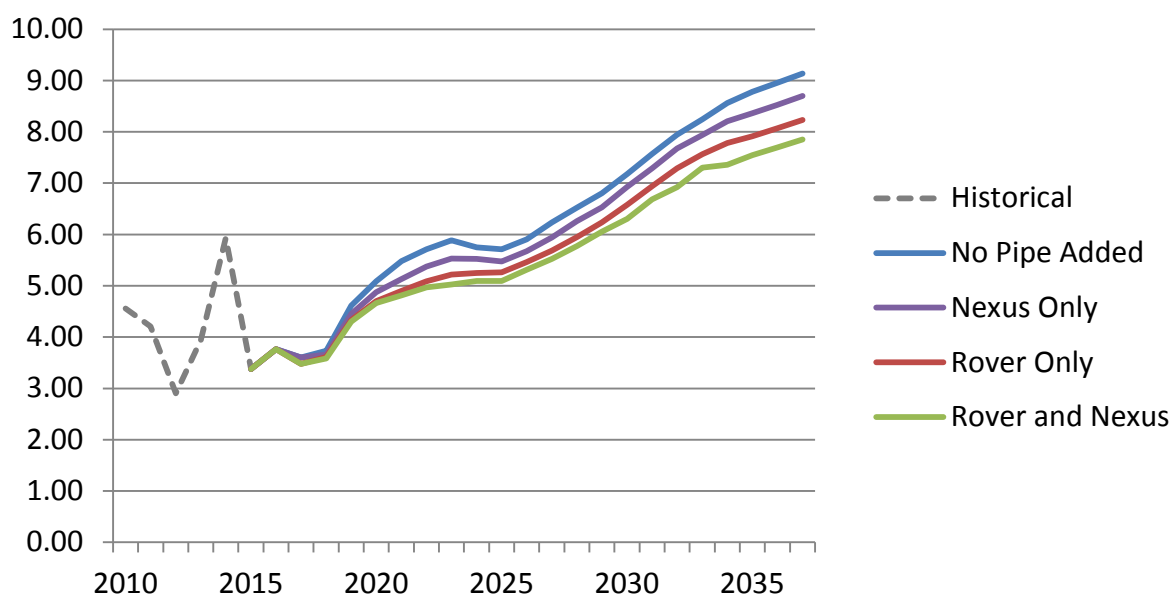
The total cost savings were calculated for the DTE Gas’ supply portfolio, given DTE Gas’ projection of gas purchases by market area with and without the NEXUS Pipeline contract. The total cost savings for all Michigan consumers were then estimated for each scenario based on the simplifying assumption that the gas supply portfolio for all Michigan gas consumers is similar to the DTE Gas’ supply portfolio.

5.2 Impact of Incremental Pipeline Capacity on Michigan Supply Portfolio Costs

5.2.1 Impact of Incremental Pipeline Capacity on Natural Gas Prices

The NEXUS Pipeline has a significant impact on natural gas prices in a range of different North American markets. The projected prices for MichCon with and without incremental pipeline capacity from the Marcellus and Utica supply regions are shown in Exhibit 5-1.

Exhibit 5-1: Impact of NEXUS Natural Gas Prices at MichCon (Average Annual Price in Nominal \$/MMBtu)



Sources: ICF GMM® CPP Cases, August 2015 (with and without Rover and NEXUS)

As shown in Exhibit 5-2, projected gas prices at MichCon average \$0.25/MMBtu lower with the addition of NEXUS capacity in the absence of Rover, and \$0.16/MMBtu lower if Rover is built. Development of the NEXUS Pipeline also results in lower natural gas prices in the supply regions that have traditionally supplied the Michigan gas market, including Alberta (AECO), Mid-continent, Chicago, and Lebanon. Gas prices are reduced in these markets due to the addition of incremental gas supplies from Marcellus/Utica, which created additional competition for supplies from these markets.

Exhibit 5-2: Impact of NEXUS on Regional Gas Prices (Average Nominal \$/MMBtu, Nov 2017-Oct 2032)

Market Locations	Nexus without Rover Scenario		Impact of NEXUS (without Rover)	Nexus with Rover Scenario		Impact of NEXUS (with Rover)
	No Pipe Added	NEXUS Only		Rover Only	Rover and NEXUS	
MichCon	5.96	5.70	(0.25)	5.47	5.32	(0.16)
Great Lakes	5.80	5.58	(0.22)	5.38	5.24	(0.14)
Viking/ANR ML-7	5.80	5.58	(0.22)	5.38	5.24	(0.14)
Vector/Chicago	5.85	5.63	(0.22)	5.41	5.28	(0.14)
Defiance	5.90	5.65	(0.25)	5.36	5.22	(0.14)
Lebanon	5.73	5.64	(0.10)	5.34	5.22	(0.11)
Panhandle Field Zone	5.56	5.38	(0.18)	5.20	5.09	(0.11)
ANR Alliance	5.85	5.63	(0.22)	5.41	5.28	(0.14)
ANR SW	5.52	5.34	(0.17)	5.16	5.05	(0.11)
(NEXUS Receipt Point)	3.78	4.01	0.23	4.32	4.49	0.17

Sources: ICF GMM® CPP Cases, August 2015 (with and without Rover and NEXUS)

In contrast, the availability of new pipeline capacity out of Marcellus/Utica reduces constraints on outbound capacity from this region; therefore, prices at both Dominion South Point and Kensington (the NEXUS receipt point) are higher with the NEXUS Pipeline. However, even though gas prices at Kensington increase with the addition of NEXUS capacity, it remains a low cost gas supply hub for Michigan natural gas consumers.

5.2.2 Impact of Change in Natural Gas Prices on Michigan Natural Gas Costs

The change in natural gas prices at the different market centers projected by ICF for the different level of pipeline capacity expansions between the Appalachian Basin and the Midwest through Michigan and into Ontario is projected to lead to a reduction in natural gas costs to Michigan consumers, regardless of whether or not DTE Gas contracts for capacity on the NEXUS Pipeline. Even without consideration of the benefits of holding NEXUS pipeline capacity, Michigan natural gas consumers are expected to save either \$1.6 billion if Rover is also developed, or \$2.5 billion if Rover is not developed, over the 15-year period from November 2017 through October 2032 due to the completion of the NEXUS Pipeline. For DTE Gas customers, the savings will be either \$251 million or \$386 million. The values for the specific pipeline capacity expansion scenarios are shown in Exhibit 5-3:

Exhibit 5-3: Impact of Building the NEXUS Pipeline on Natural Gas Supply Costs^{1/}

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Gas Customers (Million \$)	All Michigan Consumers (Million \$) ^{3/}
NEXUS Without Rover	-\$386	-\$2,455
NEXUS With Rover	-\$251	-\$1,595
^{1/} November 2017 through October 2032.		
^{2/} Based on gas price reduction, without holding NEXUS capacity in the DTE pipeline capacity portfolio.		
^{3/} DTE Gas supply portfolio represents on average 15.7 percent of total Michigan natural gas purchases between November 2017 and October 2032.		

The calculation of supply costs for each pipeline expansion scenario is included in Appendix C.

The assessment of the impact on DTE Gas' supply portfolio costs is based on the existing DTE Gas supply purchasing portfolio, calculated using the different natural gas prices for each different level of pipeline capacity. ICF did not have the data necessary to conduct a detailed assessment on the sources of natural gas supply for Michigan consumers outside of the DTE Gas service territory. Instead, we have estimated the total benefits to Michigan based on the simplifying assumption that other natural gas consumers in Michigan would have a supply purchase portfolio similar to the DTE Gas portfolio. ICF used 2014 Michigan consumption as reported by the Energy Information Administration (EIA) of 824 Bcf relative to DTE Gas' 2014 gas sales of 135 Bcf to estimate overall savings for Michigan.

5.3 Impact of NEXUS Capacity on DTE Gas Supply Portfolio

In order to evaluate the impact on the DTE Gas supply portfolio of the DTE Gas decision to contract for pipeline capacity on NEXUS, ICF estimated the costs of the DTE Gas supply portfolio with and without holding capacity on NEXUS.

5.3.1 Existing DTE Gas Transportation Contracts

DTE Gas currently holds interstate pipeline capacity on eight different pipeline corridors shown in Exhibit 5-4. The DTE Gas GCR supply plan also allows for purchases at the DTE Gas citygate. The capacity on the different pipeline corridors allows DTE Gas to purchase natural gas supply from a diverse set of supply basins and natural gas markets, and allows its customers to benefit from regional diversity of supply with increased supply reliability and mitigated price risk. Supply location diversity helps the DTE Gas mitigate adverse effects of major disruptions in the general industry supply chain. If supply becomes constrained in a particular supply basin, then a diverse supply portfolio helps in insulating DTE Gas and its customers from the risk of potential supply disruptions in that area.

Exhibit 5-4: DTE Gas Pipeline Transportation Capacity (Dth/Day)

Pipeline	Winter	Summer
Great Lakes	30,390	30,390
Viking/ANR ML-7	21,000	21,000
Vector	50,000	50,000
Panhandle Field Zone	95,000	75,000
Trunkline/Panhandle	50,000	-
ANR/Alliance	50,000	50,000
ANR SW	104,000	104,000
ANR SE	20,000	10,000
Total Contracted Pipeline Capacity	400,390	340,390

5.3.2 Impact NEXUS Capacity on DTE Gas Pipeline Capacity Portfolio

Currently, DTE Gas does not purchase any gas supply directly from the Appalachian Basin. DTE Gas has committed, subject to certain conditions, to a 15-year transportation contract with NEXUS Gas Transmission to transport up to 75 MDth/d of Utica and Marcellus shale production gas from the Appalachian Basin in Eastern Ohio to Michigan beginning in November 2017.

A primary benefit of DTE Gas holding firm capacity on NEXUS would be that it would allow DTE to reduce capacity on other pipelines, re-optimize its gas pipeline capacity portfolio, and purchase gas in ways to reduce overall supply costs. DTE Gas natural gas transportation capacity requirements are not projected to increase over the period of this analysis. Contracting for NEXUS capacity is expected to result in release of existing pipeline capacity of roughly the same maximum daily quantities (MDQ) as contracted for on NEXUS. The NEXUS capacity would replace up to 75,000 Dth/d of existing interstate pipeline capacity for a period of 15 years beginning in November 2017.

The analysis includes an assessment of future pipeline tolls on the pipeline capacity that DTE Gas will hold in its portfolio during the initial NEXUS contract period. The tolls for each of the pipeline supply options included in the DTE Gas portfolio are shown in Exhibit 5-5 below:

Exhibit 5-5: Pipeline Tolls Used in ICF Analysis

	100% Load Factor Capacity Cost (\$/Dth)	Commodity (\$/Dth)	Fuel (%)
MichCon Citygate	\$0.00	\$0.00	0.00%
Great Lakes	\$0.77	\$0.01	1.58%
Viking/ANR ML-7	\$0.32	\$0.02	1.13%
Vector	\$0.19	\$0.00	1.07%
Panhandle Field Zone	\$0.43	\$0.04	4.84%
Trunkline/Panhandle	\$0.46	\$0.03	3.94%
ANR Alliance	\$0.08	\$0.01	1.13%
ANR SW	\$0.31	\$0.02	4.13%
ANR SE	\$0.19	\$0.01	2.37%
Nexus	\$0.70	\$0.00	1.51%

Source: Calculated from DTE Gas Company 5-Year Natural Gas Supply Portfolio Forecast GCR Plan Case A16M22, December, 2015.

During the term of the existing contracts, we have assumed that tolls will remain at existing levels. Many of the DTE Gas pipeline contracts will expire prior to, or during the contract period on the NEXUS pipeline. It is uncertain whether DTE Gas will be able to renegotiate better rates on existing pipeline capacity or will be forced to return to the recourse rates for contracts that are currently below the recourse rate. Rather than project potential changes in pipeline rate discounting practices in the future to determine rates on the expiring contracts, we have assumed that the contracts will be rolled over at the existing rates paid by DTE Gas, including the negotiated tolls that in some cases are below the current FERC approved

recourse rates. These rates are held constant throughout the analysis (November 2017 through October 2032).

Certain elements of the MichCon pipeline capacity portfolio are required to meet the operational needs of the DTE Gas system, such as providing supply to parts of the system otherwise inaccessible, and could not be replaced by the NEXUS capacity. These contracts include those with Great Lakes, ANR Alliance, and Viking/ANR ML-7.

In addition, due to the structure and length of the existing pipeline contracts, it is likely that certain contracts cannot be released under contract terms. These include the long term contracts on Panhandle Eastern that do not expire until 2028 and 2029, and the contract on ANR from Alliance that does not expire until 2028.

ICF relied upon DTE Gas to identify the specific changes in pipeline contracts that would be made when NEXUS capacity is added to the pipeline portfolio. Based on their review of existing pipeline capacity contracts, DTE Gas would expect to allow the contracts shown in Exhibit 5-6 to expire, or be renewed at a lower level if they proceed with the NEXUS capacity. This set of potential contract revisions was based on knowledge available to DTE Gas at this time; the actual contract decisions will be delayed until necessary, based on the contract renewal provisions.

Exhibit 5-6: Changes in DTE Gas Pipeline Capacity Portfolio due to NEXUS

Pipeline/Contract #	Capacity (Dth/d)	Action
Panhandle Eastern #26812 (Field Zone)	10,000	Allow to expire
Panhandle Eastern #41525 (Field Zone)	20,000/10,000	Reduce to 10,000/0
Vector #FT1-MCG-026, 026a	50,000	Allow to expire
ANR #122247 (Willow Run)	15,000	Reduce to 10,000
Total Reductions	75,000	

In total, these changes would reduce annual pipeline capacity by 75,000 Dth per day, fully offsetting the increase in pipeline capacity under contract from the NEXUS contract. Exhibit 5-7 shows the DTE Gas pipeline capacity portfolio as of November 1, 2017 after the addition of the NEXUS capacity and the release of the contracts above.

Exhibit 5-7: DTE Gas Pipeline Capacity Portfolio with NEXUS

DTE Pipeline Capacity Portfolio As of 11/1/2017 After Addition of NEXUS								
DTE Contract#	Pipeline	Service	Receipt Point	Delivery Point	MDQ (Winter)	MDQ (Summer)	Start Date	Termination Date
109511	ANR Pipeline	FTS-1	SW Headstation	Sparta-Muskegon	50,000	50,000	2017/11/01	TBD
108268	ANR Pipeline	ETS	SW Headstation	Group 1	10,000	10,000	2017/11/01	TBD
108304	ANR Pipeline	ETS	SW Headstation	Group 2	15,000	15,000	2017/11/01	TBD
122247	ANR Pipeline	FTS-1	SW Headstation	Willow Run	10,000	10,000	2017/11/01	TBD
122067	ANR Pipeline	FTS-1	SW Headstation	Menominee/ Willow Run	14,000	14,000	2017/04/01	TBD
112065 *	ANR Pipeline	FTS-1	Alliance	Alpena	50,000	50,000	2001/01/14	2028/04/30
122248	ANR Pipeline	FTS-1	Marshfield	Menominee	21,000	21,000	2017/04/01	TBD
FT-A (AF0081)	Viking Gas Transmission	FT	Emerson	Marshfield	21,076	21,076	2017/04/01	TBD
FT17664	Great Lakes Gas Transmission	FT	Belle River	Various	50,000	50,000	2017/04/01	TBD
FT4634	Great Lakes Gas Transmission	FT	Emerson / Belle River	Various	10,130	10,130	2004/01/05	Evergreen
FT4635	Great Lakes Gas Transmission	FT	Emerson / Belle River	Various	20,260	20,260	2004/01/05	Evergreen
17908	Panhandle Eastern Pipe Line	EFT	Field Zone	MCON/Southern	25,000	25,000	2011/01/03	2028/10/31
18474	Panhandle Eastern Pipe Line	FT	Field Zone	MCON/Southern	40,000	40,000	2004/01/02	2029/03/31
40240	Panhandle Eastern Pipe Line	FT	Bourbon/Tuscola	MCON	50,000	-	2017/04/01	TBD
29464	Trunkline Gas Company	FT	E. LA	Bourbon/Tuscola	50,000	-	2017/04/01	TBD
41525	Panhandle Eastern Pipe Line	FT	Field Zone	MCON	10,000	-	2017/10/02	TBD
	Nexus		Ohio Producing/Ke Willow run		75,000	75,000	11/1/2017	2032/10/31

Blue values reflect changes to the pipeline portfolio required due to renewals of expiring contracts.

Red values reflect the changes in the remaining pipeline portfolio in response to the NEXUS contract.

The net effect of the conversion of these pipeline contracts to NEXUS contracts will increase the fixed costs of pipeline firm transportation. ICF estimates that the increase will be on the order of \$12.8 million per year as shown in Exhibit 5-8. The table shows reduced capacity costs for the pipelines where contracts will be allowed to expire or MDQs reduced (Vector, Panhandle, and ANR SW), and the addition of NEXUS costs. However, the additional cost of pipeline capacity will be more than made up in lower overall portfolio costs as described in the next subsections.

Exhibit 5-8: Annual Pipeline Reservation Costs with and without NEXUS

Pipeline	Without NEXUS	With NEXUS	Impact of NEXUS
Great Lakes	8,571,140	8,571,140	-
Viking/ANR ML-7	2,453,903	2,453,903	-
Vector	3,448,953	-	(3,448,953)
Panhandle Field Zone	13,103,728	10,876,094	(2,227,634)
Trunkline/Panhandle	3,503,058	3,503,058	-
ANR Alliance	1,490,411	1,490,411	-
ANR SW	11,633,118	11,073,834	(559,285)
ANR SE	-	-	-
NEXUS	-	19,025,625	19,025,625
Total Pipeline Reservation	44,204,311	56,994,065	12,789,753

5.4 Impact of NEXUS Capacity on DTE Gas Supply Portfolio

Having capacity on NEXUS will change the pattern of natural gas purchases by DTE Gas. The price of natural gas at the NEXUS receipt point is expected to provide the lowest cost opportunity to purchase natural gas supply for DTE Gas during almost all time periods. The difference will be substantial enough that even with the higher cost of NEXUS demand charges, the delivered cost of Marcellus/Utica gas over NEXUS will be the lowest or among the lowest cost sources of supply for DTE Gas, due to a combination of low-cost supply, no commodity charge, and a low fuel percentage (1.51%).

Exhibit 5-9 shows ICF's forecast of average delivered gas costs over the pipelines serving DTE Gas with and without NEXUS for three time periods corresponding to gas years for the 1.5 Bcfd NEXUS scenario. Exhibit 5-9 shows the same information for the NEXUS and Rover scenario.

It should be noted that with NEXUS, delivered costs of all of the pipelines are lower than without NEXUS. NEXUS supplies will be the lowest cost into the DTE Gas Citygate in both scenarios after the first five years.

ICF expects DTE Gas to maximize throughput over NEXUS at or close to 100% load factor. This will reduce the flows on other pipelines. Using a merit order of pipeline utilization that minimizes the average cost of gas at the Citygate, and accounting for some pipeline/supply paths that must be used despite their rank in the merit order, ICF has projected the change in average daily commodity purchases by month. The overall decline in flows of 75,000 Dth per day shown in Exhibit 5-11 correspond to the increase in purchased from the Appalachian Basin that will be delivered using the NEXUS pipeline capacity.

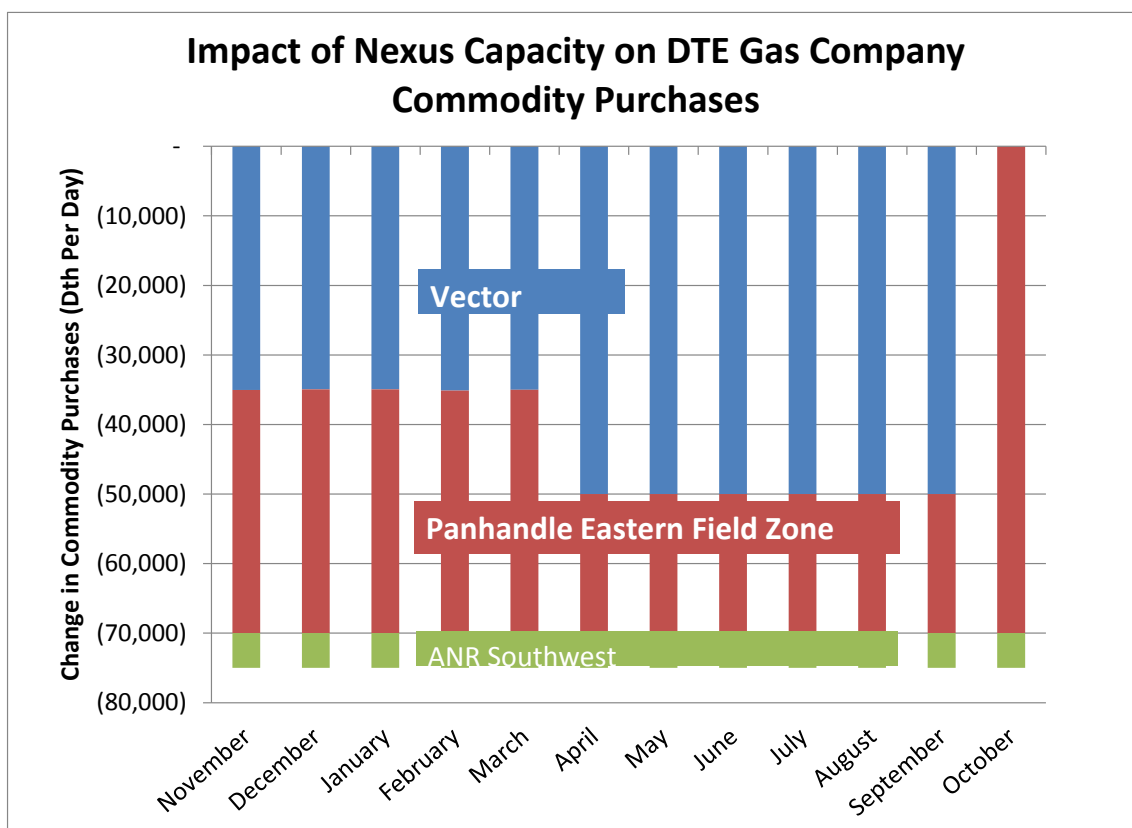
Exhibit 5-9: Citygate Delivered Gas Cost by Pipeline – NEXUS Only Scenario (\$/Dth)

Pipelines	Gas Years			
	2017/18 to 2021/22	2022/23 to 2026/27	2027/28 to 2031/32	2017/18 to 2031/32
DTE does not hold Nexus Capacity				
MichCon Citygate	4.63	5.61	6.88	5.70
Great Lakes	5.45	6.41	7.64	6.50
Viking/ANR ML-7	4.95	5.90	7.13	5.99
Vector	4.81	5.78	7.05	5.88
Panhandle Field Zone	5.27	6.28	7.53	6.36
Trunkline/Panhandle	-	-	-	-
ANR Alliance	4.79	5.74	7.03	5.89
ANR SW	4.85	5.81	7.04	5.90
Nexus	In this case, DTE Gas does not hold NEXUS capacity			
Average Delivered Gas Price	4.98	5.95	7.19	6.04
DTE Holds Nexus Capacity				
MichCon Citygate	4.63	5.61	6.88	5.70
Great Lakes	5.45	6.41	7.64	6.50
Viking/ANR ML-7	4.95	5.90	7.13	5.99
Vector	In this case, Vector capacity is allowed to expire			
Panhandle Field Zone	5.65	6.80	8.05	6.83
Trunkline/Panhandle	-	-	-	-
ANR Alliance	4.74	5.68	7.01	5.84
ANR SW	4.85	5.81	7.04	5.90
Nexus	4.18	4.60	5.59	4.79
Average Delivered Gas Price	4.83	5.66	6.85	5.78

Exhibit 5-10: Citygate Delivered Gas Cost by Pipeline – NEXUS and Rover Scenario (\$/Dth)

Pipelines	Gas Years			
	2017/18 to 2021/22	2022/23 to 2026/27	2027/28 to 2031/32	2017/18 to 2031/32
DTE does not hold Nexus Capacity				
MichCon Citygate	4.41	5.20	6.35	5.32
Great Lakes	5.25	6.03	7.16	6.15
Viking/ANR ML-7	4.75	5.53	6.66	5.65
Vector	4.61	5.40	6.55	5.52
Panhandle Field Zone	5.09	5.95	7.09	6.04
Trunkline/Panhandle	-	-	-	-
ANR Alliance	4.58	5.37	6.53	5.52
ANR SW	4.68	5.49	6.61	5.59
Nexus	In this case, DTE Gas does not hold NEXUS capacity			
Average Delivered Gas Price	4.79	5.59	6.73	5.70
DTE Holds Nexus Capacity				
MichCon Citygate	4.41	5.20	6.35	5.32
Great Lakes	5.25	6.03	7.16	6.15
Viking/ANR ML-7	4.75	5.53	6.66	5.65
Vector	In this case, Vector capacity is allowed to expire			
Panhandle Field Zone	5.47	6.47	7.61	6.52
Trunkline/Panhandle	-	-	-	-
ANR Alliance	4.55	5.33	6.51	5.49
ANR SW	4.68	5.49	6.61	5.59
Nexus	4.50	5.18	6.12	5.27
Average Delivered Gas Price	4.75	5.52	6.62	5.63

Exhibit 5-11: Impact of NEXUS Capacity on DTE Gas Commodity Purchases



The change in purchase patterns is reflected in a significant rebalancing of the DTE Gas supply portfolio, shown in Exhibit 5-12.

Exhibit 5-12: Impact of NEXUS on DTE Gas Supply Diversity

	Without Nexus	With Nexus
MichCon Citygate	16%	16%
Chicago/Midwest	22%	6%
Mid-Continent	48%	43%
Western Canadian Sedimentary Basin	14%	14%
Appalachian Basin	0%	21%
Total	100%	100%

5.5 Impact of NEXUS on DTE Gas Supply Portfolio Costs

In this section, we estimate the savings that would occur as a result of DTE Gas holding 75,000 Dth of capacity on NEXUS and purchasing gas in the Marcellus/Utica formations as part of a re-optimized supply portfolio. NEXUS would allow DTE Gas to reduce purchases from some sources in favor of the lower cost gas supplies expected to be available at the NEXUS receipt point.

The net cost savings to DTE Gas customers from holding NEXUS capacity are projected to range from \$461 million in the NEXUS Only pipeline scenario (where only 1.5 Bcf per day of capacity is built from the Appalachian Basin to the Midwest) to \$124 million if both NEXUS and Rover are developed, adding 4.75 Bcf per day of capacity within this corridor.

Based on the assessment of commodity prices in each of the four different pipeline expansion scenarios, the value of holding NEXUS pipeline capacity is highest in the scenarios where only NEXUS capacity is built from the Appalachian Basin. As additional capacity is built, the price of gas in the Appalachian Basin is expected to increase relative to other supply basins, reducing the potential value of holding NEXUS capacity. However, even in the most aggressive pipeline capacity scenario considered— where both NEXUS and Rover are built and total pipeline capacity expansions from the Appalachian Basin into the Midwest reach 4.75 Bcfd— holding NEXUS capacity continues to provide significant benefits to DTE Gas customers. ICF's estimates of the additional savings arising from a revised purchasing pattern for each of the four pipeline capacity scenarios including the NEXUS Pipeline expansion are shown in Exhibit 5-13.

The pattern of these portfolio savings is also of interest. Exhibit 5-14 provides a graphical representation of annual savings each year for the 1.5 Bcf/day capacity scenario. The savings start in the first year of the contract, and generally increase over time. The increase is a result of the Base Case forecast of expanding Marcellus/Utica production, leading to lower gas prices in the Appalachian basin relative to other sources of gas for DTE Gas.

Exhibit 5-13: Impact of Contracting for 75,000 Dth/Day of NEXUS Pipeline Capacity on DTE Gas Supply Portfolio Costs

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Gas Supply Portfolio Cost (Million \$)		Change in Supply Portfolio Cost Due to NEXUS (Million \$)	Annual Change in Supply Portfolio Cost Due to NEXUS (Million \$)
	Without The NEXUS Capacity Contract	With the NEXUS Capacity Contract		
NEXUS Without Rover	\$11,486	\$11,025	-\$461	-\$31
NEXUS With Rover	\$10,846	\$10,722	-\$124	-\$8
^{1/} November 2017 through October 2032.				
^{2/} Including gas purchase costs, pipeline capacity costs, pipeline commodity costs, and pipeline fuel costs.				

Exhibit 5-14: Impact of NEXUS on Annual DTE Gas Supply Portfolio Costs

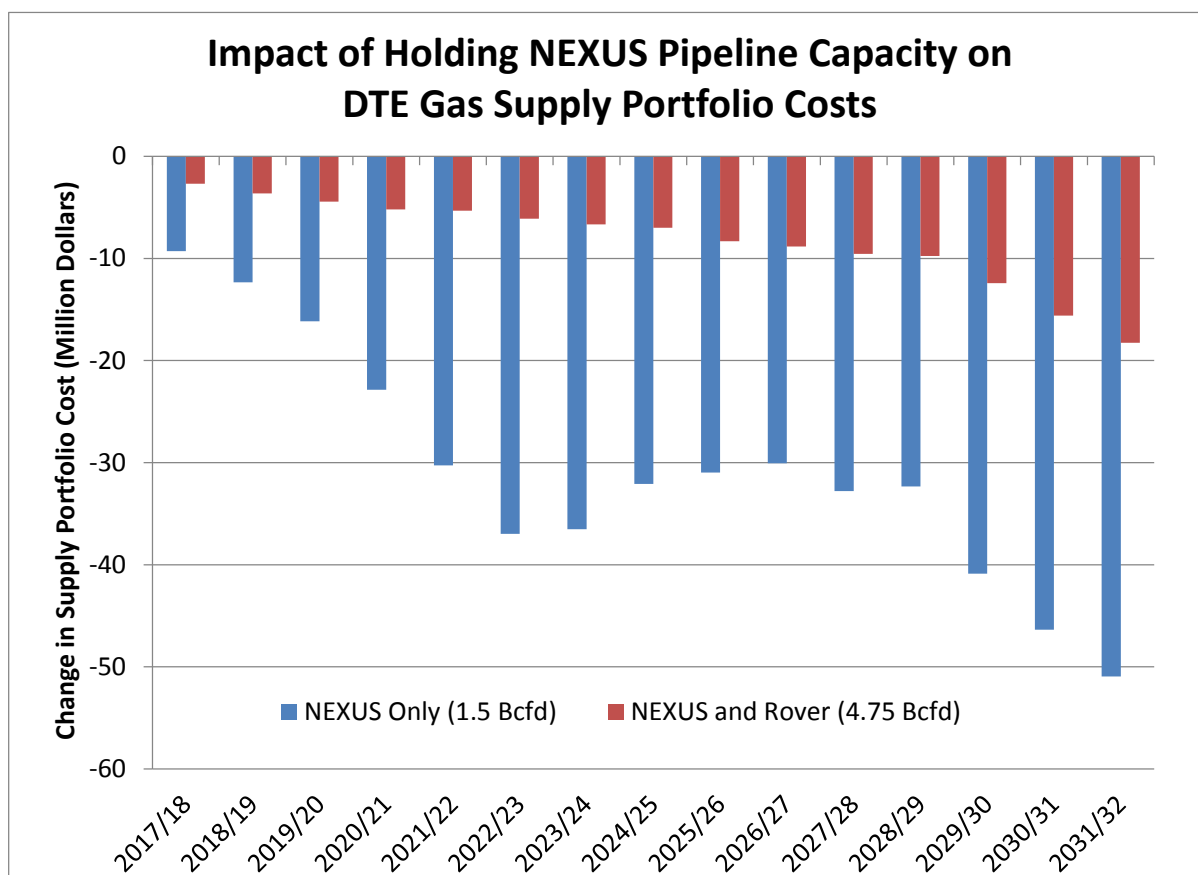


Exhibit 5-16 provides additional detail on the impact of holding NEXUS capacity on DTE Gas supply portfolio costs for each of the different pipeline expansion scenarios evaluated. This exhibit breaks out the costs with and without NEXUS capacity for pipeline capacity costs, pipeline fuel and usage costs, and commodity purchase costs.

Exhibit 5-15: Impact of Holding NEXUS Capacity on Supply Portfolio Costs (Million \$)

No New Pipeline Capacity Built from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact of NEXUS Contract
	With NEXUS Contract	Without NEXUS Contract	Impact of NEXUS Contract	
Pipeline Capacity Costs	N.A.	\$663	N.A.	N.A.
Pipeline Fuel and Usage Costs	N.A.	\$319	N.A.	N.A.
Commodity Purchase Costs	N.A.	\$10,890	N.A.	N.A.
Total Supply Portfolio Costs	N.A.	\$11,872	N.A.	N.A.
NEXUS (1.5 Bcfd of New Pipeline Capacity) Built from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact of NEXUS Contract
	With NEXUS Contract	Without NEXUS Contract	Impact of NEXUS Contract	
Pipeline Capacity Costs	\$855	\$663	\$192	\$12.79
Pipeline Fuel and Usage Costs	\$293	\$309	(\$16)	(\$1.04)
Commodity Purchase Costs	\$9,877	\$10,515	(\$637)	(\$42.47)
Total Supply Portfolio Costs	\$11,025	\$11,486	(\$461)	(\$30.72)
Rover (3.25 Bcfd of New Pipeline Capacity) Built from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact of NEXUS Contract
	With NEXUS Contract	Without NEXUS Contract	Impact of NEXUS Contract	
Pipeline Capacity Costs	N.A.	\$663	N.A.	N.A.
Pipeline Fuel and Usage Costs	N.A.	\$298	N.A.	N.A.
Commodity Purchase Costs	N.A.	\$10,135	N.A.	N.A.
Total Supply Portfolio Costs	N.A.	\$11,096	N.A.	N.A.
Rover and NEXUS (4.75 Bcfd of New Pipeline Capacity) Built from the Appalachian Basin to the Midwest				
Cost Elements	15 Years			Average Annual Impact of NEXUS Contract
	With NEXUS Contract	Without NEXUS Contract	Impact of NEXUS Contract	
Pipeline Capacity Costs	\$855	\$663	\$192	\$12.79
Pipeline Fuel and Usage Costs	\$277	\$291	(\$15)	(\$0.97)
Commodity Purchase Costs	\$9,590	\$9,891	(\$301)	(\$20.07)
Total Supply Portfolio Costs	\$10,722	\$10,846	(\$124)	(\$8.26)

5.6 Total Impact of NEXUS Capacity on DTE Gas Supply Portfolio

The benefits accruing to DTE Gas customers and to Michigan gas consumers due to the impact of the development of pipeline capacity from the Appalachian Basin into Michigan on natural gas prices, and the benefits to DTE Gas customers of holding capacity on the NEXUS pipeline are cumulative. When the benefits of holding 75,000 Dth of pipeline capacity on NEXUS are added to the gas cost savings associated with the increase in pipeline capacity from the Appalachian Basin to Michigan, the total reduction in gas supply portfolio costs for DTE Gas customers ranges from \$375 million to \$847 million, and the total cost savings to all Michigan gas consumers ranges from \$1.7 billion to \$2.9 billion, depending on whether or not Rover pipeline is included in the analysis. The total impact of new pipeline capacity is shown in Exhibit 5-16.¹⁷

¹⁷ The benefits to Michigan consumers do not include potential benefits from parties other than DTE Gas that might also hold capacity on NEXUS.

Exhibit 5-16: Total Impact of NEXUS Pipeline Capacity from Eastern Ohio into Michigan on Michigan Natural Gas Supply Costs^{1,2}

Incremental Amount of Pipeline Capacity Built from Eastern Ohio to Michigan	DTE Gas Customers (Million \$)	All Michigan Consumers (Million \$) ³
NEXUS Without Rover	-\$847	-\$2,916
NEXUS With Rover	-\$375	-\$1,719
^{1/} November 2017 through October 2032.		
^{2/} Includes the impact of 75,000 Dth of NEXUS Capacity in the DTE Gas supply portfolio as well as the impact of the NEXUS Pipeline.		
^{3/} DTE Gas supply portfolio represents 15.7 percent of total Michigan natural gas purchases.		

5.7 Benefit of Direct Access to Marcellus/Utica Production Area Prices

Holding NEXUS capacity provides the ability to purchase natural gas at prices in the Marcellus and Utica supply basins. While NEXUS provides a direct link from the Marcellus and Utica into Michigan, the majority of the value of holding NEXUS capacity is on the section of the pipeline from the Marcellus and Utica producing plays into Central and Western Ohio. ICF's projection of natural gas prices in the scenario that includes both Rover and NEXUS indicates that of the average price difference (also referred to as "basis spread") between the Appalachian Basin and the MichCon Citygate between November 2017 and October 2032, about 75 percent of the total difference occurs between the Appalachian Basin around Dominion Southpoint and the gas market centers in western Ohio (see Exhibit 5-2 above). Because lower gas prices are located closer to the source in Marcellus/Utica, holding capacity on a pipeline that reaches all the way back to supplies at Kensington provides greater benefit to DTE Gas than purchasing Marcellus/Utica production at locations outside of the production region.

5.8 Benefit of Supply Diversity Provided by Holding NEXUS Capacity

Holding Nexus capacity will allow DTE Gas to significantly diversify its existing natural gas supply portfolio. Currently, none of the gas in the DTE Gas portfolio is sourced directly from the Appalachian Basin. After the NEXUS contract is in place, DTE Gas would be able to purchase about 21% of its gas supply from this source. The Appalachian Basin is the fastest growing supply basin in North America, and natural gas prices there are projected to be lower than any other major supply basin in North America after 2020. As a result, holding NEXUS capacity will provide DTE Gas with direct access to a major new low-cost natural gas market.

The NEXUS contract also allows DTE Gas to reduce purchases from other supply basins, including the WCSB in Canada and the Midcontinent in the U.S. This increase of supply diversity should reduce price volatility and increase supply reliability. The volatility reduction arises from both the lower volatility of gas prices in the Marcellus and the larger overall pipeline capacity into the region that reduces system constraints.

The increasing importance of the Appalachian Basin increases the supply risk associated with the other supply basins relied upon by DTE Gas. Growth in Appalachian Basin production and the resulting decline in overall gas prices will continue to put pressure on these producing regions, reducing production, and increasing prices in these regions relative to prices in the Appalachian Basin.

6 Conclusions

The broad changes in natural gas markets that have occurred in the last five years and that are expected to continue to occur in the future are resulting in changes in the optimal supply portfolio for DTE Gas.

The most important change is the growth in natural gas production from the Marcellus and Utica plays in the Appalachian Basin. As the Appalachian Basin becomes more important, and as prices in the Appalachian Basin decline relative to other sources of supply available to DTE Gas, the economics of natural gas supply from the different available sources is changing. The Appalachian Basin is projected to become the lowest priced source of natural gas available to DTE Gas by 2021, while Mid-Continent, Canadian and Gulf Coast supplies are projected to become increasingly more expensive.

ICF has evaluated the impact of a range of different pipeline capacity options that might be developed to bring natural gas from the Appalachian Basin to the Midwest and the DTE Citygate. Under all of the scenarios evaluated, the incremental pipeline capacity provides substantial benefits to both DTE Gas customers and to Michigan natural gas consumers as a whole.

Exhibit 6-1: Total Impact of NEXUS Pipeline Capacity on Michigan Natural Gas Supply Costs^{1/}

	Nexus Only (No Rover)	Nexus and Rover
Impact of Building Nexus	-\$386	-\$251
Impact of Contracting on Nexus	-\$461	-\$124
Total Impact of NEXUS	-\$847	-\$375
^{1/} November 2017 through October 2032.		

As shown in Exhibit 6-1, ICF is projecting total savings to DTE Gas customers of \$251 million due to the construction of NEXUS if Rover is also built, and \$386 million if only NEXUS is built over the 15 year period from November 2017 to October 2032. These savings will accrue to DTE Gas customers, regardless of whether DTE Gas contracts for capacity on the new pipelines.

In addition, holding capacity on the NEXUS pipeline will enable DTE Gas to save an additional \$124 million in the scenario where Rover is also built, and \$461 million in the scenario where only NEXUS is built, over the 15 year contract period.

In total, ICF is projecting savings to DTE Gas customers (including the benefits due to the construction of the pipeline, and the benefits of holding capacity on the NEXUS Pipeline) of between \$375 and \$847 million over the 15 year period from November 2017 to October 2032, depending on whether or not Rover is built in addition to NEXUS.

Savings to Michigan natural gas consumers are projected to be larger, at between \$2.3 and \$2.8 billion due to the larger volumes that will benefit from lower natural gas prices.

Appendix A: ICF Natural Gas Supply Assessment Methodology

ICF's Natural Gas Supply Assessment Methodology (ISAM) covers the Continental United States, Alaska and Canada. The Continental United States is represented in 28 onshore regions (see Figure A-1) and 11 offshore regions.

Figure A-1: NPC Continental US Supply Regions



Alaska is divided into seven regions and Canada is divided into ten regions. All regions are further broken out into subregions or “intervals.” They represent some combination of drilling depths, water depth, or geographic areas.

Resources are divided into three general categories: new fields/new pools, field appreciation, and unconventional gas. The methodology for resource characterization and economic evaluation differs for each.

New Fields

New discoveries are characterized by size class. For the United States, the number of fields within a size class is broken down into oil fields, high permeability gas fields, and low permeability gas fields based on the expected occurrence of each type of field within the region and interval being modeled. The fields are characterized further as having a

hydrocarbon make-up containing a certain percent each of crude oil, dry natural gas, and natural gas liquids. In Canada, fields are oil, sweet nonassociated gas, or sour nonassociated gas.

The methodology uses a modified “Arps-Roberts” equation to estimate the rate at which new fields are discovered. The fundamental theory behind the find-rate methodology is that the probability of finding a field is proportional to the field's size as measured by its areal extent, which is highly correlated to the field's level of reserves. For this reason, larger fields tend to be found earlier in the discovery process than smaller fields. The new equation developed by ICF accurately tracks discovery rates for mid- to small-size fields. Since these are the only fields left to be discovered in many mature areas, the more accurate find-rate representation is an important component in analyzing the economics of exploration activity in these areas.

The find-rate equations are used in the model to predict the number of fields of a certain size that will be discovered after a given number of exploratory wells have been drilled. There are separate equations for each field-size class (e.g., size class 6 is between one and two million barrels of oil equivalent) within each depth interval, within each region. The Continental US portion of the model alone has over 3,000 separate find-rate equations. This is a very fine level of detail given that actual annual new field discoveries have been below 600 fields in recent years.

An economic evaluation is made in the model each year for potential new field exploration programs using a standard discounted after-tax discounted cash flow (DCF) analysis. This DCF analysis takes into account how many fields of each type are expected to be found and economics of developing each. There are about 7,000 prototype field development plans in the model for the Continental US that include all capital and operating costs and production timing specifications built up from historical data. The economic decision to develop a field is made using “sunk cost” economics where the discovery cost are ignored and only time-forward development costs and production revenues are considered. However, the model's decision to begin an exploration program includes all exploration and development costs.

The results for new field exploration are reported in standard output tables that show the marginal economics (internal rate of return and resource cost) of exploration in each region and interval throughout the forecast. There are also outputs in Excel and Access format showing the number of fields being found, recoverable hydrocarbons discovered and recoverable hydrocarbons developed.

Unconventional Gas

The ICF assessment method for shale gas is a “bottom-up” approach that first generates estimates of unrisks and risks gas-in-place (GIP) from maps of depth, thickness, organic content, and thermal maturity. Then, ICF uses a different model to estimate well recoveries and production profiles. Unrisks GIP is the amount of original gas-in-place determined to be present based upon geological factors— without risk reductions. “Risks GIP” includes a factor to reduce the total gas volume on the basis of proximity to existing production and geologic factors such as net thickness (e.g., remote areas, thinner areas, and areas of high thermal maturity have higher risk). ICF calibrates expected well recoveries with specific geological settings to actual well recoveries by using a rigorous method of analysis of historical well data. In late 2011, ICF undertook an extensive analysis of Marcellus well

recoveries and compared them with model results with good correlation. ICF confirmed that the model well recoveries are conservative. Additional analysis in 2012 also confirmed these results.

Major Unconventional Natural Gas Categories

Definition of Unconventional Gas: *Quantities of natural gas that occur in continuous, widespread accumulations in low quality reservoir rocks (including low permeability or tight gas, coalbed methane, and shale gas), that are produced through wellbores but require advanced technologies or procedures for economic production.*

Tight Gas is defined as natural gas from gas-bearing sandstones or carbonates with an *in situ* permeability (flow rate capability) to gas of less than 0.1 millidarcy. Many tight gas sands have *in situ* permeability as low as 0.001 millidarcy. Wells are typically vertical or directional and require artificial stimulation.

Coalbed Methane is defined as natural gas produced from coal seams. The coal acts as both the source and reservoir for the methane. Wells are typically vertical but can be horizontal. Some coals are wet and require water removal to produce the gas, while others are dry.

Shale Gas is defined as natural gas from shale formations. The shale acts as both the source and reservoir for the methane. Older shale gas wells were vertical while more recent wells are primarily horizontal with artificial stimulation. Only shale formations with certain characteristics will produce gas.

Shale Oil with Associated Gas is defined as associated gas from oil shale in horizontal drilling plays such as the Bakken in the Williston Basin. The gas is produced through boreholes along with the oil.

Upstream Cost and Technology Factors

In ICF's methodology, supply technology advancements effects are represented in three categories:

- Improved exploratory success rates
- Cost reductions of platform, drilling, and other components
- Improved recovery per well

These factors are included in the model by region and type of gas and represent several dozen actual model parameters. ICF's database contains base year cost for wells, platforms, operations and maintenance, and other relevant cost items.

Appendix B: ICF's Gas Market Model (GMM®)

ICF's Gas Market Model (GMM®) is an internationally recognized modeling and market analysis system for the North American gas market. The GMM was developed in the mid-1990s to provide forecasts of the U.S. and Canada natural gas market under different assumptions. In its infancy, the model was used to simulate changes in the gas market that occur when major new sources of gas supply are delivered into the marketplace. Subsequently, GMM has been used to complete strategic planning studies for many private sector companies. The different studies include:

- Analyses of different pipeline expansions
- Measuring the impact of gas-fired power generation growth
- Assessing the impact of low and high gas supply
- Assessing the impact of different regulatory environments

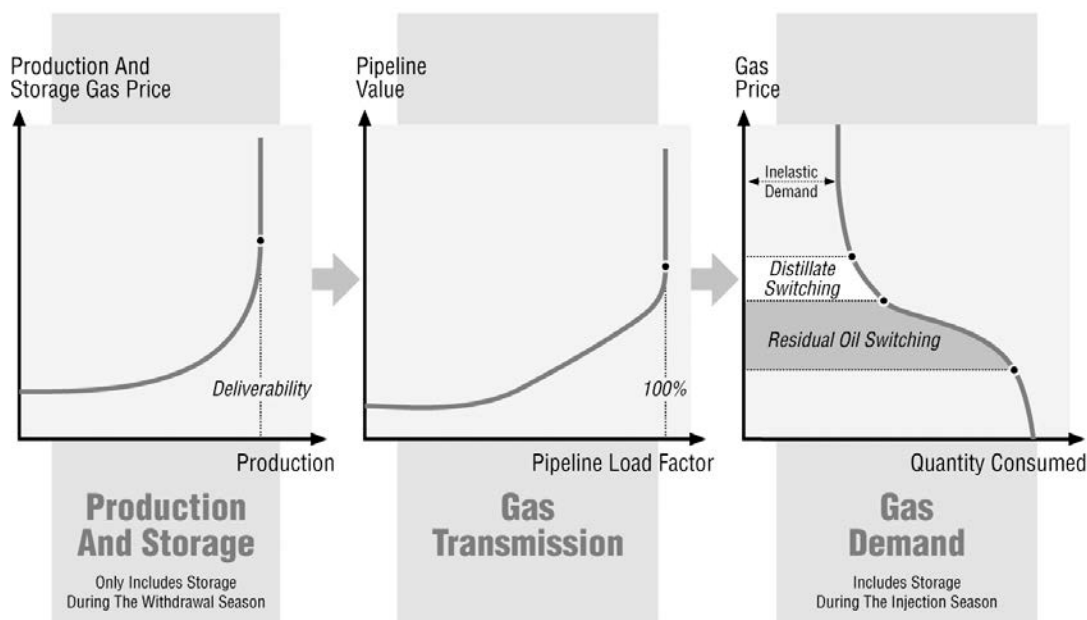
In addition to its use for strategic planning studies, the model has been widely used by a number of institutional clients and advisory councils, including Interstate Natural Gas Association of America (INGAA), which has relied on the GMM for multiple studies over the past ten years. The model was also the primary tool used to complete the widely referenced study on the North American Gas market for the National Petroleum Council in 2003, and the 2010 Natural Gas Market Review for the Ontario Energy Board.

GMM is a full supply/demand equilibrium model of the North American gas market. The model solves for monthly natural gas prices throughout North America, given different supply/demand conditions, the assumptions for which are specified by scenario. Overall, the model solves for monthly market clearing prices by considering the interaction between supply and demand curves at each of the model's nodes. On the supply-side of the equation, prices are determined by production and storage price curves that reflect prices as a function of production and storage utilization (Figure B-1) Prices are also influenced by "pipeline discount" curves, which reflect the change in basis or the marginal value of gas transmission as a function of load factor. On the demand-side of the equation, prices are represented by a curve that captures the fuel-switching behavior of end-users at different price levels. The model balances supply and demand at all nodes in the model at the market clearing prices determined by the shape of the supply and curves. Unlike other commercially available models for the gas industry, ICF does significant backcasting (calibration) of the model's curves and relationships on a monthly basis to make sure that the model reliably reflects historical gas market behavior, instilling confidence in the projected results.

Figure B-1: ICF's Gas Market Data and Forecasting System

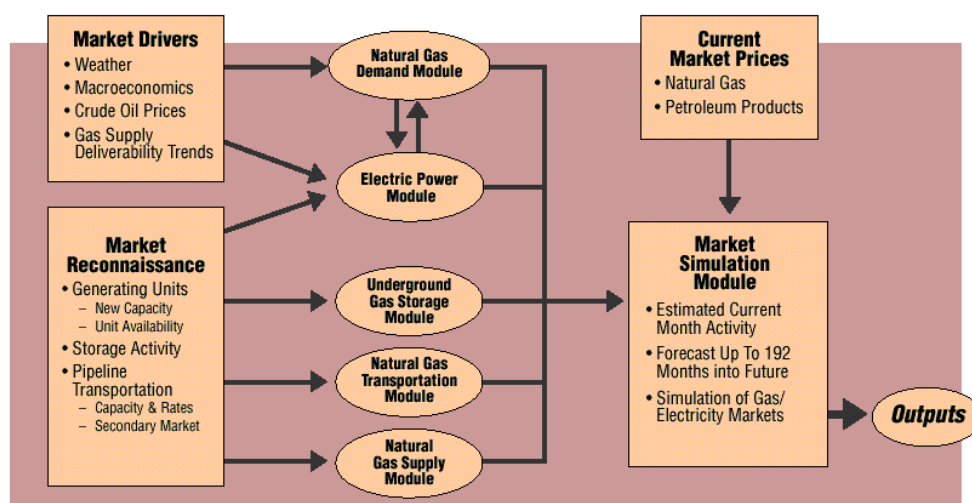
Gas Quantity And Price Response

EEA's Gas Market Data And Forecasting System



There are nine different components of GMM, as shown in Figure B-2. The user specifies input for the model in the "drivers" spreadsheet and then provides assumptions for weather, economic growth, oil prices, and gas supply deliverability, among other variables. ICF's market reconnaissance keeps the model up to date with generating capacity, storage and pipeline expansions, and the impact of regulatory changes in gas transmission. This is important to maintaining model credibility and confidence of results.

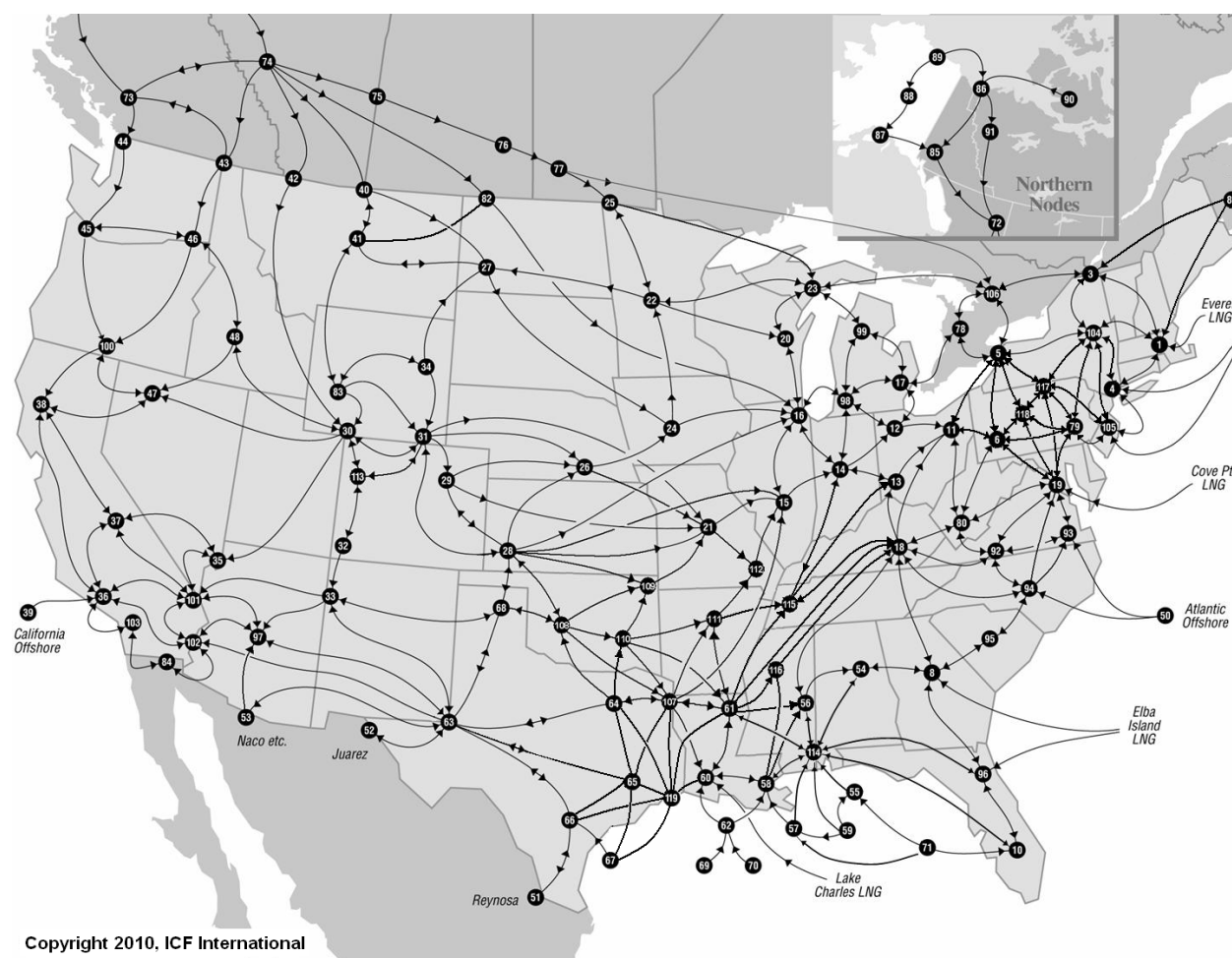
Figure B-2: GMM Components



The first model routine solves for gas demand across different sectors, given economic growth, weather, and the level of price competition between gas and oil. The second model

routine solves the power generation dispatch on a regional basis to determine the amount of gas used in power generation, which is allocated along with end-use gas demand to model nodes. The model nodes are tied together by a series of network links in the gas transportation module. The structure of the transmission network is shown in Figure B-3. The gas supply component of the model solves for node-level natural gas deliverability or supply capability, including LNG import and export levels. The last routine in the model solves for gas storage injections and withdrawals at different gas prices. The components of supply (i.e., gas deliverability, storage withdrawals, supplemental gas, LNG imports, and Mexican imports) are balanced against demand (i.e., end-use demand, power generation gas demand, LNG exports, and Mexican exports) at each of the nodes and gas prices are solved for in the market simulation module.

Figure B-3: GMM Transmission Network



Appendix C: DTE Gas Supply Portfolio Costs for Alternative Pipeline Capacity Scenarios

- C.1 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – No Capacity Expansion Scenario
- C.2 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – NEXUS Only Capacity Expansion Scenario
- C.3 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – NEXUS Only Capacity Expansion Scenario
- C.4 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – Rover Only Capacity Expansion Scenario
- C.5 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – Rover and NEXUS Capacity Expansion Scenario
- C.6 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – Rover and NEXUS Capacity Expansion Scenario

C.1 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – No Capacity Expansion Scenario

Michigan Public Service Commission																	
DTE Gas Company																	
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																	
November 2017 - October 2032																	
No New Pipeline Scenario																	
Page 1 of 4																	
Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Panhandle Field Zone	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Average Pipeline Capacity	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	
Source of Supply/ Transportation																	
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	56,064	51,666	51,616	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	
Great Lakes	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	
Viking/ANR ML-7	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Panhandle Field Zone	66,131	69,924	64,816	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ANR Alliance	25,889	25,347	31,576	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Average Transportation Utilization	352,018	350,871	351,942	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,781	

[illegible]

Michigan Public Service Commission																
DTE Gas Company																
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																
November 2017 - October 2032																
No New Pipeline Scenario																
Page 2 of 4																
Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.014
Viking/ANR ML-7	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.023
Vector	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.002
Panhandle Field Zone	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.044
Trunkline/Panhandle	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.026
ANR Alliance	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.010
ANR SW	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.018
ANR SE	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.011
Nexus	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
Viking/ANR ML-7	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Vector	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Panhandle Field Zone	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
ANR SW	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.58	\$4.48	\$5.02	\$5.44	\$5.70	\$5.86	\$5.80	\$5.69	\$5.86	\$6.17	\$6.48	\$6.76	\$7.10	\$7.50	\$7.87	\$5.96
Great Lakes	\$3.53	\$4.41	\$4.92	\$5.32	\$5.58	\$5.72	\$5.66	\$5.54	\$5.71	\$5.99	\$6.29	\$6.56	\$6.89	\$7.28	\$7.62	\$5.80
Viking/ANR ML-7	\$3.53	\$4.41	\$4.92	\$5.32	\$5.58	\$5.72	\$5.66	\$5.54	\$5.71	\$5.99	\$6.29	\$6.56	\$6.89	\$7.28	\$7.62	\$5.80
Vector	\$3.51	\$4.41	\$4.94	\$5.35	\$5.60	\$5.75	\$5.70	\$5.59	\$5.76	\$6.06	\$6.37	\$6.64	\$6.98	\$7.37	\$7.73	\$5.85
Panhandle Field Zone	\$3.28	\$4.18	\$4.70	\$5.10	\$5.34	\$5.48	\$5.42	\$5.32	\$5.48	\$5.76	\$6.06	\$6.31	\$6.63	\$7.00	\$7.34	\$5.56
Trunkline/Panhandle	\$3.28	\$4.18	\$4.70	\$5.10	\$5.34	\$5.48	\$5.42	\$5.32	\$5.48	\$5.76	\$6.06	\$6.31	\$6.63	\$7.00	\$7.34	\$5.56
ANR Alliance	\$3.51	\$4.41	\$4.94	\$5.35	\$5.60	\$5.75	\$5.70	\$5.59	\$5.76	\$6.06	\$6.37	\$6.64	\$6.98	\$7.37	\$7.73	\$5.85
ANR SW	\$3.26	\$4.15	\$4.67	\$5.06	\$5.30	\$5.44	\$5.38	\$5.28	\$5.44	\$5.72	\$6.01	\$6.26	\$6.58	\$6.95	\$7.29	\$5.52
ANR SE	\$3.41	\$4.35	\$4.90	\$5.31	\$5.55	\$5.69	\$5.62	\$5.52	\$5.68	\$5.97	\$6.27	\$6.53	\$6.86	\$7.24	\$7.60	\$5.77
Nexus	\$2.59	\$3.21	\$3.40	\$3.33	\$3.28	\$3.25	\$3.39	\$3.56	\$3.82	\$4.13	\$4.31	\$4.54	\$4.53	\$4.61	\$4.83	\$3.78

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	128,567,100
Viking/ANR ML-7	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	36,808,539
Vector	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	51,734,299
Panhandle Field Zone	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	196,555,917
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875
ANR Alliance	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	22,356,166
ANR SW	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	174,496,775
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	663,064,671
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	755,672	907,117	996,523	1,067,217	1,111,320	1,137,165	1,126,381	1,109,117	1,138,648	1,189,555	1,241,961	1,289,082	1,347,373	1,414,364	1,476,329	17,307,823
Viking/ANR ML-7	475,477	550,268	594,592	629,077	650,668	662,993	657,595	647,681	661,812	686,397	711,974	734,769	763,190	796,271	826,083	10,048,846
Vector	720,339	890,782	991,856	1,070,383	1,119,557	1,147,626	1,135,445	1,112,765	1,144,942	1,200,938	1,259,244	1,311,162	1,375,853	1,451,258	1,519,200	17,451,349
Panhandle Field Zone	5,112,727	6,556,288	6,632,570	7,011,099	7,297,745	7,463,889	7,362,348	7,272,830	7,473,955	7,814,378	8,153,092	8,465,390	8,865,416	9,296,674	9,699,856	114,478,254
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	444,949	520,257	715,480	758,728	791,903	809,292	790,983	784,226	808,644	848,597	885,710	923,238	971,069	1,016,737	1,059,416	12,129,227
ANR SW	6,192,030	7,604,583	8,436,838	9,078,834	9,473,427	9,709,478	9,620,203	9,456,654	9,728,748	10,194,773	10,679,050	11,104,176	11,631,294	12,246,384	12,815,181	147,971,653
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	13,701,194	17,029,294	18,367,859	19,615,338	20,444,619	20,930,443	20,692,954	20,383,272	20,956,748	21,934,637	22,931,031	23,827,817	24,954,195	26,221,689	27,396,063	319,387,153
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	72,538,621	82,152,375	90,180,308	98,977,784	104,294,103	106,858,359	103,043,945	102,776,994	106,776,195	113,111,857	118,667,614	124,765,496	132,851,991	139,651,271	146,131,577	1,642,778,491
Great Lakes	37,530,372	46,780,104	52,212,312	56,525,728	59,219,224	60,757,570	59,994,666	58,838,188	60,605,408	63,671,162	66,819,059	69,662,930	73,239,651	77,316,666	81,001,976	924,175,016
Viking/ANR ML-7	26,773,331	33,392,043	37,314,536	40,366,317	42,277,004	43,367,683	42,889,982	42,012,678	43,263,157	45,438,847	47,702,280	49,719,576	52,234,716	55,162,184	57,800,440	659,714,773
Vector	63,994,252	80,437,634	90,125,834	97,599,252	102,192,667	104,940,519	103,901,279	101,997,414	105,164,833	110,589,787	116,227,208	121,176,060	127,312,188	134,472,392	141,093,693	1,601,225,012
Panhandle Field Zone	78,361,506	106,533,265	110,182,015	118,087,881	123,663,667	126,919,835	124,743,070	123,028,337	127,019,142	133,717,103	140,311,608	146,325,623	154,214,062	162,616,452	170,541,972	1,946,265,538
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	32,728,738	39,752,229	55,929,898	59,978,096	63,050,833	64,709,599	63,151,617	62,533,752	64,791,418	68,470,873	71,912,717	75,379,436	79,765,691	84,016,031	87,972,825	974,143,753
ANR SW	123,703,941	157,590,646	177,234,912	192,206,673	201,051,515	206,345,184	203,959,598	200,209,539	206,493,234	217,135,273	228,118,857	237,610,386	249,675,003	263,591,761	276,580,837	3,141,507,359
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	435,630,761	546,638,295	613,179,814	663,741,731	695,749,014	713,898,750	701,684,157	691,396,902	714,113,386	752,134,901	789,759,343	824,639,507	869,293,303	916,826,756	961,123,320	10,889,809,942

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Total Gas Supply Portfolio Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	72,538,621	82,152,375	90,180,308	98,977,784	104,294,103	106,858,359	103,043,945	102,776,994	106,776,195	113,111,857	118,667,614	124,765,496	132,851,991	139,651,271	146,131,577	1,642,778,491
Great Lakes	46,857,184	56,258,361	61,779,975	66,164,085	68,901,684	70,465,875	69,692,186	68,518,444	70,315,196	73,431,858	76,632,161	79,523,152	83,158,165	87,302,170	91,049,445	1,070,049,940
Viking/ANR ML-7	29,702,710	36,396,213	40,363,030	43,449,297	45,381,574	46,484,579	46,001,479	45,114,262	46,378,871	48,579,146	50,868,156	52,908,248	55,451,809	58,412,357	61,080,426	706,572,159
Vector	68,163,544	84,777,369	94,566,643	102,118,588	106,761,178	109,537,098	108,485,678	106,559,132	109,758,728	115,239,677	120,935,405	125,936,175	132,136,994	139,372,603	146,061,846	1,670,410,659
Panhandle Field Zone	96,577,960	126,193,280	129,918,313	138,202,707	144,065,140	147,487,451	145,209,146	143,404,895	147,596,825	154,635,208	161,568,428	167,894,741	176,183,206	185,016,854	193,345,556	2,257,299,710
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875
ANR Alliance	34,664,098	41,762,897	58,135,789	62,227,236	65,333,147	67,009,303	65,433,010	64,808,389	67,090,473	70,809,880	74,288,837	77,793,085	82,227,171	86,523,179	90,522,652	1,008,629,146
ANR SW	141,529,089	176,828,347	197,304,868	212,918,626	222,158,060	227,687,781	225,212,920	221,299,311	227,855,100	238,963,165	250,431,026	260,347,680	272,939,415	287,471,264	301,029,136	3,463,975,787
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	493,536,266	607,871,900	675,751,985	727,561,381	760,397,944	779,033,504	766,581,423	755,984,486	779,274,446	818,273,850	856,894,685	892,671,635	938,451,809	987,252,757	990,396,615	11,872,261,766

Delivered Gas Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.54	\$4.36	\$4.79	\$5.25	\$5.54	\$5.67	\$5.47	\$5.45	\$5.67	\$6.00	\$6.30	\$6.62	\$7.05	\$7.41	\$7.76	\$5.78
Great Lakes	\$4.40	\$5.29	\$5.81	\$6.22	\$6.48	\$6.62	\$6.55	\$6.44	\$6.61	\$6.90	\$7.20	\$7.47	\$7.81	\$8.20	\$8.56	\$6.70
Viking/ANR ML-7	\$3.92	\$4.80	\$5.32	\$5.73	\$5.98	\$6.13	\$6.06	\$5.95	\$6.11	\$6.40	\$6.71	\$6.98	\$7.31	\$7.70	\$8.05	\$6.21
Vector	\$3.73	\$4.65	\$5.18	\$5.60	\$5.85	\$6.00	\$5.94	\$5.84	\$6.01	\$6.31	\$6.63	\$6.90	\$7.24	\$7.64	\$8.00	\$6.10
Panhandle Field Zone	\$4.00	\$4.94	\$5.49	\$5.92	\$6.17	\$6.32	\$6.22	\$6.15	\$6.33	\$6.63	\$6.93	\$7.20	\$7.55	\$7.93	\$8.29	\$6.39
Trunkline/Panhandle	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
ANR Alliance	\$3.67	\$4.51	\$5.04	\$5.48	\$5.75	\$5.90	\$5.76	\$5.71	\$5.91	\$6.24	\$6.54	\$6.85	\$7.24	\$7.62	\$7.97	\$6.06
ANR SW	\$3.73	\$4.66	\$5.20	\$5.61	\$5.85	\$6.00	\$5.93	\$5.83	\$6.00	\$6.30	\$6.60	\$6.86	\$7.19	\$7.57	\$7.93	\$6.08
ANR SE	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Nexus	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Average Delivered Gas Price	\$3.84	\$4.75	\$5.26	\$5.69	\$5.94	\$6.09	\$5.99	\$5.91	\$6.09	\$6.39	\$6.70	\$6.98	\$7.33	\$7.72	\$7.74	\$6.18

Total Cost By Category (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$663,064,671
Pipeline Fuel and Usage Costs	\$13,701,194	\$17,029,294	\$18,367,859	\$19,615,338	\$20,444,619	\$20,930,443	\$20,692,954	\$20,383,272	\$20,956,748	\$21,934,637	\$22,931,031	\$23,827,817	\$24,954,195	\$26,221,689	\$27,396,063	\$319,387,153
Commodity Purchase Costs	\$435,630,761	\$546,638,295	\$613,179,814	\$663,741,731	\$695,749,014	\$713,898,750	\$701,684,157	\$691,396,902	\$714,113,386	\$752,134,901	\$789,759,343	\$824,639,507	\$869,293,303	\$916,826,756	\$961,123,320	\$10,889,809,942
Total Costs	\$493,536,266	\$607,871,900	\$675,751,985	\$727,561,381	\$760,397,944	\$779,033,504	\$766,581,423	\$755,984,486	\$779,274,446	\$818,273,850	\$856,894,685	\$892,671,635	\$938,451,809	\$987,252,757	\$1,032,723,695	\$11,872,261,766

C.2 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – NEXUS Only Capacity Expansion Scenario

[illegible]

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023
Vector	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
Viking/ANR ML-7	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Vector	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Panhandle Field Zone	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
ANR SW	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.51	\$4.35	\$4.82	\$5.12	\$5.35	\$5.51	\$5.54	\$5.47	\$5.62	\$5.89	\$6.21	\$6.50	\$6.85	\$7.24	\$7.60	\$5.70
Great Lakes	\$3.47	\$4.28	\$4.74	\$5.03	\$5.25	\$5.41	\$5.44	\$5.36	\$5.50	\$5.76	\$6.06	\$6.34	\$6.68	\$7.05	\$7.40	\$5.58
Viking/ANR ML-7	\$3.47	\$4.28	\$4.74	\$5.03	\$5.25	\$5.41	\$5.44	\$5.36	\$5.50	\$5.76	\$6.06	\$6.34	\$6.68	\$7.05	\$7.40	\$5.58
Vector	\$3.46	\$4.30	\$4.76	\$5.06	\$5.28	\$5.44	\$5.47	\$5.40	\$5.55	\$5.82	\$6.12	\$6.41	\$6.75	\$7.14	\$7.49	\$5.63
Panhandle Field Zone	\$3.27	\$4.10	\$4.56	\$4.85	\$5.06	\$5.22	\$5.24	\$5.17	\$5.31	\$5.57	\$5.86	\$6.13	\$6.46	\$6.82	\$7.16	\$5.38
Trunkline/Panhandle	\$3.27	\$4.10	\$4.56	\$4.85	\$5.06	\$5.22	\$5.24	\$5.17	\$5.31	\$5.57	\$5.86	\$6.13	\$6.46	\$6.82	\$7.16	\$5.38
ANR Alliance	\$3.46	\$4.30	\$4.76	\$5.06	\$5.28	\$5.44	\$5.47	\$5.40	\$5.55	\$5.82	\$6.12	\$6.41	\$6.75	\$7.14	\$7.49	\$5.63
ANR SW	\$3.24	\$4.07	\$4.52	\$4.81	\$5.03	\$5.18	\$5.20	\$5.13	\$5.27	\$5.52	\$5.82	\$6.09	\$6.41	\$6.77	\$7.11	\$5.34
ANR SE	\$3.41	\$4.27	\$4.75	\$5.05	\$5.26	\$5.41	\$5.44	\$5.36	\$5.51	\$5.77	\$6.08	\$6.36	\$6.70	\$7.08	\$7.43	\$5.59
Nexus	\$2.63	\$3.36	\$3.68	\$3.74	\$3.69	\$3.60	\$3.65	\$3.73	\$3.93	\$4.22	\$4.43	\$4.73	\$4.76	\$4.94	\$5.12	\$4.01

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	128,567,100
Viking/ANR ML-7	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	36,808,539
Vector	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	51,734,299
Panhandle Field Zone	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	196,555,917
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875
ANR Alliance	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	22,356,166
ANR SW	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	174,496,775
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	663,064,671
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	744,319	883,969	961,948	1,012,959	1,052,693	1,079,548	1,084,445	1,071,759	1,098,789	1,143,250	1,196,095	1,245,062	1,304,500	1,369,264	1,430,466	16,679,067
Viking/ANR ML-7	470,531	539,848	578,431	603,602	622,868	636,416	638,830	631,779	644,483	666,273	691,993	716,307	745,243	777,244	806,593	9,770,442
Vector	709,084	867,075	955,038	1,012,373	1,056,166	1,087,051	1,092,602	1,076,530	1,105,416	1,155,093	1,213,685	1,269,103	1,334,945	1,407,905	1,474,750	16,816,815
Panhandle Field Zone	5,063,844	6,414,685	6,429,024	6,676,640	6,959,141	7,127,023	7,145,538	7,060,432	7,253,464	7,539,284	7,890,306	8,208,037	8,620,334	9,034,177	9,440,635	110,862,564
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	441,176	506,714	696,523	724,655	762,930	778,799	777,427	765,806	791,936	822,509	862,365	897,276	948,506	992,817	1,038,029	11,807,469
ANR SW	6,124,777	7,428,270	8,154,210	8,620,912	8,972,628	9,220,347	9,268,982	9,151,482	9,395,167	9,808,399	10,293,867	10,743,628	11,279,057	11,876,594	12,435,521	142,773,841
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	13,553,731	16,640,561	17,775,175	18,651,141	19,426,425	19,929,184	20,007,823	19,757,788	20,289,254	21,134,807	22,148,312	23,079,414	24,232,587	25,458,002	26,625,994	308,710,199
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	70,870,168	79,091,793	86,712,970	92,909,116	99,580,879	101,560,340	100,872,731	99,092,751	103,737,360	108,141,013	114,381,020	119,701,762	128,432,111	134,968,345	142,119,106	1,582,171,464
Great Lakes	36,906,746	45,460,566	50,204,512	53,339,018	55,809,553	57,478,083	57,737,812	56,866,954	58,489,822	61,170,342	64,368,079	67,368,027	71,026,702	74,958,747	78,618,503	889,803,465
Viking/ANR ML-7	26,335,675	32,469,924	35,884,367	38,111,858	39,816,786	41,015,787	41,229,408	40,605,367	41,729,629	43,657,981	45,934,109	48,085,760	50,646,508	53,478,446	56,075,664	635,077,270
Vector	63,211,364	78,385,196	86,835,798	92,268,625	96,362,914	99,246,584	99,812,746	98,444,938	101,281,651	106,092,040	111,743,333	116,978,957	123,211,833	130,167,697	136,674,114	1,540,717,791
Panhandle Field Zone	77,986,024	104,261,530	106,580,297	111,884,983	117,653,884	121,005,389	121,309,422	119,487,361	123,331,953	128,937,790	135,871,653	142,044,866	150,253,034	158,324,657	166,357,005	1,885,289,848
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	32,287,484	38,446,936	53,940,965	56,599,901	59,977,495	61,452,218	61,384,970	60,423,022	62,812,644	65,662,269	69,321,014	72,560,718	77,206,334	81,338,392	85,513,992	938,928,352
ANR SW	123,122,504	154,356,023	171,618,642	182,545,822	190,849,404	196,513,629	197,502,718	194,551,128	200,219,920	209,639,733	220,797,915	230,944,801	243,326,080	256,859,051	269,683,090	3,042,530,461
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	430,719,966	532,471,968	591,777,551	627,659,321	660,050,914	678,272,029	679,849,807	669,471,521	691,602,980	723,301,169	762,417,122	797,684,893	844,102,602	890,095,335	935,041,473	10,514,518,651

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Total Gas Supply Portfolio Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	70,870,168	79,091,793	86,712,970	92,909,116	99,580,879	101,560,340	100,872,731	99,092,751	103,737,360	108,141,013	114,381,020	119,701,762	128,432,111	134,968,345	142,119,106	1,582,171,464
Great Lakes	46,222,205	54,915,675	59,737,600	62,923,117	65,433,385	67,128,771	67,393,396	66,509,853	68,159,751	70,884,732	74,135,314	77,184,230	80,902,343	84,899,150	88,620,109	1,035,049,633
Viking/ANR ML-7	29,260,108	35,463,675	38,916,701	41,169,362	42,893,556	44,106,106	44,322,141	43,691,049	44,828,014	46,778,157	49,080,005	51,255,970	53,845,654	56,709,593	59,336,160	681,656,252
Vector	67,369,401	82,701,224	91,239,790	96,729,951	100,868,033	103,782,589	104,354,301	102,970,421	105,836,020	110,696,086	116,405,971	121,697,014	127,995,731	135,024,555	141,597,817	1,609,268,904
Panhandle Field Zone	96,153,597	123,779,943	126,113,048	131,665,350	137,716,753	141,236,140	141,558,688	139,651,521	143,689,145	149,580,802	156,865,686	163,356,631	171,977,096	180,462,562	188,901,368	2,192,708,330
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875
ANR Alliance	34,219,071	40,444,060	56,127,899	58,814,966	62,230,836	63,721,429	63,652,808	62,679,239	65,094,991	67,975,189	71,673,790	74,948,405	79,645,251	83,821,621	88,042,432	973,091,987
ANR SW	140,880,400	173,417,411	191,405,971	202,799,852	211,455,150	217,367,093	218,404,818	215,335,728	221,248,205	231,081,250	242,724,901	253,321,548	266,238,256	280,368,764	293,751,729	3,359,801,076
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	488,478,009	593,316,840	653,757,037	690,514,773	723,681,651	742,405,525	744,061,942	733,433,621	756,096,545	788,640,288	828,769,745	864,968,618	912,539,500	959,757,648	962,126,107	11,486,293,521

Delivered Gas Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.46	\$4.19	\$4.60	\$4.93	\$5.29	\$5.39	\$5.35	\$5.26	\$5.51	\$5.74	\$6.07	\$6.35	\$6.82	\$7.16	\$7.54	\$5.57
Great Lakes	\$4.34	\$5.16	\$5.61	\$5.91	\$6.15	\$6.31	\$6.33	\$6.25	\$6.41	\$6.66	\$6.97	\$7.25	\$7.60	\$7.98	\$8.33	\$6.48
Viking/ANR ML-7	\$3.86	\$4.68	\$5.13	\$5.43	\$5.66	\$5.81	\$5.84	\$5.76	\$5.91	\$6.17	\$6.47	\$6.76	\$7.10	\$7.48	\$7.82	\$5.99
Vector	\$3.69	\$4.53	\$5.00	\$5.30	\$5.53	\$5.69	\$5.72	\$5.64	\$5.80	\$6.07	\$6.38	\$6.67	\$7.01	\$7.40	\$7.76	\$5.88
Panhandle Field Zone	\$3.98	\$4.85	\$5.33	\$5.64	\$5.90	\$6.05	\$6.07	\$5.99	\$6.16	\$6.41	\$6.72	\$7.00	\$7.37	\$7.74	\$8.10	\$6.21
Trunkline/Panhandle	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
ANR Alliance	\$3.62	\$4.37	\$4.87	\$5.18	\$5.48	\$5.61	\$5.61	\$5.52	\$5.73	\$5.99	\$6.31	\$6.60	\$7.01	\$7.38	\$7.75	\$5.85
ANR SW	\$3.71	\$4.57	\$5.04	\$5.34	\$5.57	\$5.73	\$5.75	\$5.67	\$5.83	\$6.09	\$6.39	\$6.67	\$7.01	\$7.39	\$7.74	\$5.90
ANR SE	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Nexus	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Average Delivered Gas Price	\$3.80	\$4.63	\$5.09	\$5.40	\$5.66	\$5.80	\$5.81	\$5.73	\$5.91	\$6.16	\$6.48	\$6.76	\$7.13	\$7.50	\$7.52	\$5.98

Total Cost By Category (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$663,064,671
Pipeline Fuel and Usage Costs	\$13,553,731	\$16,640,561	\$17,775,175	\$18,651,141	\$19,426,425	\$19,929,184	\$20,007,823	\$19,757,788	\$20,289,254	\$21,134,807	\$22,148,312	\$23,079,414	\$24,232,587	\$25,458,002	\$26,625,994	\$308,710,199
Commodity Purchase Costs	\$430,719,966	\$532,471,968	\$591,777,551	\$627,659,321	\$660,050,914	\$678,272,029	\$679,849,807	\$669,471,521	\$691,602,980	\$723,301,169	\$762,417,122	\$797,684,893	\$844,102,602	\$890,095,335	\$935,041,473	\$10,514,518,651
Total Costs	\$488,478,009	\$593,316,840	\$653,757,037	\$690,514,773	\$723,681,651	\$742,405,525	\$744,061,942	\$733,433,621	\$756,096,545	\$788,640,288	\$828,769,745	\$864,968,618	\$912,539,500	\$959,757,648	\$1,005,871,779	\$11,486,293,521

C.3 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – NEXUS Only Capacity Expansion Scenario

[illegible]

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	
Viking/ANR ML-7	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	
Vector	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	
ANR SE	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Great Lakes	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	
Viking/ANR ML-7	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Vector	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Panhandle Field Zone	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	
ANR Alliance	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
ANR SW	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	
Nexus	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Commodity Purchase Price (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	\$3.51	\$4.35	\$4.82	\$5.12	\$5.35	\$5.51	\$5.54	\$5.47	\$5.62	\$5.89	\$6.21	\$6.50	\$6.85	\$7.24	\$7.60	\$5.70	
Great Lakes	\$3.47	\$4.28	\$4.74	\$5.03	\$5.25	\$5.41	\$5.44	\$5.36	\$5.50	\$5.76	\$6.06	\$6.34	\$6.68	\$7.05	\$7.40	\$5.58	
Viking/ANR ML-7	\$3.47	\$4.28	\$4.74	\$5.03	\$5.25	\$5.41	\$5.44	\$5.36	\$5.50	\$5.76	\$6.06	\$6.34	\$6.68	\$7.05	\$7.40	\$5.58	
Vector	\$3.46	\$4.30	\$4.76	\$5.06	\$5.28	\$5.44	\$5.47	\$5.40	\$5.55	\$5.82	\$6.12	\$6.41	\$6.75	\$7.14	\$7.49	\$5.63	
Panhandle Field Zone	\$3.27	\$4.10	\$4.56	\$4.85	\$5.06	\$5.22	\$5.24	\$5.17	\$5.31	\$5.57	\$5.86	\$6.13	\$6.46	\$6.82	\$7.16	\$5.38	
Trunkline/Panhandle	\$3.27	\$4.10	\$4.56	\$4.85	\$5.06	\$5.22	\$5.24	\$5.17	\$5.31	\$5.57	\$5.86	\$6.13	\$6.46	\$6.82	\$7.16	\$5.38	
ANR Alliance	\$3.46	\$4.30	\$4.76	\$5.06	\$5.28	\$5.44	\$5.47	\$5.40	\$5.55	\$5.82	\$6.12	\$6.41	\$6.75	\$7.14	\$7.49	\$5.63	
ANR SW	\$3.24	\$4.07	\$4.52	\$4.81	\$5.03	\$5.18	\$5.20	\$5.13	\$5.27	\$5.52	\$5.82	\$6.09	\$6.41	\$6.77	\$7.11	\$5.34	
ANR SE	\$3.41	\$4.27	\$4.75	\$5.05	\$5.26	\$5.41	\$5.44	\$5.36	\$5.51	\$5.77	\$6.08	\$6.36	\$6.70	\$7.08	\$7.43	\$5.59	
Nexus	\$2.63	\$3.36	\$3.68	\$3.74	\$3.69	\$3.60	\$3.65	\$3.73	\$3.93	\$4.22	\$4.43	\$4.73	\$4.76	\$4.94	\$5.12	\$4.01	

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	128,567,100
Viking/ANR ML-7	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	36,808,539
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	163,141,411
Trunkline/Panhandle	3,503,058	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	52,519,002
ANR Alliance	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	22,356,166
ANR SW	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	166,107,507
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	285,384,375
Total Pipeline Capacity Cost	56,994,065	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	854,884,100
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	744,319	883,969	961,948	1,012,959	1,052,693	1,079,548	1,084,445	1,071,759	1,098,789	1,143,250	1,196,095	1,245,062	1,304,500	1,369,264	1,430,466	16,679,067
Viking/ANR ML-7	470,531	539,848	578,431	603,602	622,868	636,416	638,830	631,779	644,483	666,273	691,993	716,307	745,243	777,244	806,593	9,770,442
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	3,971,780	5,105,143	4,995,463	5,169,920	5,409,723	5,536,050	5,540,244	5,474,876	5,636,751	5,852,255	6,126,305	6,369,345	6,707,914	7,019,735	7,339,717	86,255,219
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	354,366	406,788	589,297	610,836	640,859	653,985	653,752	643,990	665,603	692,337	726,104	756,195	797,696	835,453	872,593	9,899,854
ANR SW	5,830,317	7,071,142	7,762,181	8,206,445	8,541,251	8,777,061	8,823,358	8,711,507	8,943,476	9,336,841	9,798,970	10,227,108	10,736,795	11,305,604	11,837,659	135,909,714
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	1,408,396	1,764,812	1,962,512	2,086,509	2,175,907	2,237,452	2,247,181	2,214,767	2,278,365	2,385,898	2,512,751	2,629,029	2,768,723	2,923,934	3,070,532	34,666,769
Total Pipeline Usage Costs	12,779,708	15,771,702	16,849,833	17,690,272	18,443,301	18,920,511	18,987,810	18,748,677	19,267,467	20,076,854	21,052,218	21,943,047	23,060,871	24,231,234	25,357,561	293,181,066
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	69,802,999	77,655,854	85,126,100	91,252,243	97,892,463	99,819,589	99,102,450	97,306,592	101,877,050	106,170,043	112,300,275	117,517,181	126,156,475	132,624,247	139,698,185	1,554,301,745
Great Lakes	36,906,746	45,460,566	50,204,512	53,339,018	55,809,553	57,478,083	57,737,812	56,866,954	58,489,822	61,170,342	64,368,079	67,368,027	71,026,702	74,958,747	78,618,503	889,803,465
Viking/ANR ML-7	26,335,675	32,469,924	35,884,367	38,111,858	39,816,786	41,015,787	41,229,408	40,605,367	41,729,629	43,657,981	45,934,109	48,085,760	50,646,508	53,478,446	56,075,664	635,077,270
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	61,217,839	82,969,258	82,730,904	86,560,699	91,475,944	94,013,369	94,045,728	92,647,948	95,872,625	100,097,127	105,511,943	110,239,213	116,997,806	123,079,827	129,408,947	1,466,869,179
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	25,911,667	30,865,249	45,692,424	47,758,033	50,409,129	51,638,468	51,668,075	50,861,860	52,834,554	55,322,423	58,419,176	61,209,510	64,974,443	68,496,898	71,930,385	787,992,294
ANR SW	117,203,153	146,935,061	163,367,746	173,769,580	181,673,951	187,065,858	188,007,395	185,197,708	190,593,962	199,560,900	210,182,631	219,841,685	231,627,711	244,510,059	256,717,557	2,896,254,958
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	72,033,331	91,864,731	100,748,296	102,167,718	100,899,682	98,492,271	99,775,626	102,111,002	107,473,318	115,538,191	121,218,493	129,434,439	130,174,632	135,031,749	140,133,458	1,647,096,936
Total Commodity Cost	409,411,410	508,220,643	563,754,348	592,959,148	617,977,509	629,523,424	631,566,494	625,597,432	648,870,959	681,517,008	717,934,706	753,695,816	791,604,277	832,179,972	872,582,699	9,877,395,846

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Total Gas Supply Portfolio Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	69,802,999	77,655,854	85,126,100	91,252,243	97,892,463	99,819,589	99,102,450	97,306,592	101,877,050	106,170,043	112,300,275	117,517,181	126,156,475	132,624,247	139,698,185	1,554,301,745
Great Lakes	46,222,205	54,915,675	59,737,600	62,923,117	65,433,385	67,128,771	67,393,396	66,509,853	68,159,751	70,884,732	74,135,314	77,184,230	80,902,343	84,899,150	88,620,109	1,035,049,633
Viking/ANR ML-7	29,260,108	35,463,675	38,916,701	41,169,362	42,893,556	44,106,106	44,322,141	43,691,049	44,828,014	46,778,157	49,080,005	51,255,970	53,845,654	56,709,593	59,336,160	681,656,252
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	76,065,713	98,950,495	98,602,462	102,606,713	107,761,761	110,425,513	110,462,067	108,998,918	112,385,470	116,825,476	122,514,341	127,484,652	134,581,814	140,975,656	147,624,758	1,716,265,809
Trunkline/Panhandle	3,503,058	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	52,519,002
ANR Alliance	27,756,444	32,762,448	47,772,131	49,859,280	52,540,400	53,782,863	53,812,238	52,996,261	54,990,568	57,505,171	60,635,691	63,456,117	67,262,550	70,822,762	74,293,389	820,248,313
ANR SW	134,107,304	165,080,036	182,203,761	193,049,859	201,289,037	206,916,752	207,904,587	204,983,049	210,611,272	219,971,575	231,055,434	241,142,627	253,438,340	266,889,496	279,629,050	3,198,272,178
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	92,467,352	112,655,168	121,736,433	123,279,852	122,101,214	119,755,348	121,048,432	123,351,394	128,777,308	136,949,714	142,756,869	151,089,093	151,968,980	156,981,308	162,229,615	1,967,148,080
Total Gas Supply Portfolio Cost	479,185,183	580,984,490	637,596,326	667,641,565	693,412,955	705,436,081	707,546,450	701,338,255	725,130,572	758,586,007	795,979,069	832,631,008	871,657,294	913,403,351	954,932,405	11,025,461,012

Delivered Gas Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.46	\$4.18	\$4.59	\$4.92	\$5.28	\$5.38	\$5.34	\$5.25	\$5.49	\$5.73	\$6.06	\$6.34	\$6.80	\$7.15	\$7.53	\$83.34
Great Lakes	\$4.34	\$5.16	\$5.61	\$5.91	\$6.15	\$6.31	\$6.33	\$6.25	\$6.41	\$6.66	\$6.97	\$7.25	\$7.60	\$7.98	\$8.33	\$97.27
Viking/ANR ML-7	\$3.86	\$4.68	\$5.13	\$5.43	\$5.66	\$5.81	\$5.84	\$5.76	\$5.91	\$6.17	\$6.47	\$6.76	\$7.10	\$7.48	\$7.82	\$89.87
Vector	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Panhandle Field Zone	\$4.01	\$4.86	\$5.33	\$5.65	\$5.93	\$6.08	\$6.08	\$6.00	\$6.19	\$6.43	\$6.74	\$7.02	\$7.41	\$7.76	\$8.12	\$93.31
Trunkline/Panhandle	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
ANR Alliance	\$3.65	\$4.42	\$4.93	\$5.24	\$5.52	\$5.65	\$5.66	\$5.57	\$5.78	\$6.04	\$6.37	\$6.67	\$7.07	\$7.44	\$7.81	\$88.59
ANR SW	\$3.71	\$4.57	\$5.04	\$5.34	\$5.57	\$5.73	\$5.75	\$5.67	\$5.83	\$6.09	\$6.39	\$6.67	\$7.01	\$7.39	\$7.74	\$88.51
ANR SE	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Nexus	\$3.38	\$4.12	\$4.45	\$4.50	\$4.46	\$4.37	\$4.42	\$4.51	\$4.70	\$5.00	\$5.21	\$5.52	\$5.55	\$5.73	\$5.93	\$71.86
Average Delivered Gas Price	\$3.73	\$4.54	\$4.96	\$5.22	\$5.42	\$5.51	\$5.53	\$5.48	\$5.67	\$5.93	\$6.22	\$6.51	\$6.81	\$7.14	\$7.46	\$86.11

Total Cost By Category (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$56,994,065	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$854,884,100
Pipeline Fuel and Usage Costs	\$12,779,708	\$15,771,702	\$16,849,833	\$17,690,272	\$18,443,301	\$18,920,511	\$18,987,810	\$18,748,677	\$19,267,467	\$20,076,854	\$21,052,218	\$21,943,047	\$23,060,871	\$24,231,234	\$25,357,561	\$293,181,066
Commodity Purchase Costs	\$409,411,410	\$508,220,643	\$563,754,348	\$592,959,148	\$617,977,509	\$629,523,424	\$631,566,494	\$625,597,432	\$648,870,959	\$681,517,008	\$717,934,706	\$753,695,816	\$791,604,277	\$832,179,972	\$872,582,699	\$9,877,395,846
Total Costs	\$479,185,183	\$580,984,490	\$637,596,326	\$667,641,565	\$693,412,955	\$705,436,081	\$707,546,450	\$701,338,255	\$725,130,572	\$758,586,007	\$795,979,069	\$832,631,008	\$871,657,294	\$913,403,351	\$954,932,405	\$11,025,461,012

C.4 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – Rover Only Capacity Expansion Scenario

[illegible]

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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014
Viking/ANR ML-7	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023
Vector	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018
ANR SE	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
Great Lakes	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
Viking/ANR ML-7	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Vector	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Panhandle Field Zone	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
ANR Alliance	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
ANR SW	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Nexus	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	\$3.46	\$4.24	\$4.65	\$4.90	\$5.08	\$5.20	\$5.26	\$5.25	\$5.43	\$5.67	\$5.93	\$6.24	\$6.57	\$6.95	\$7.28	\$5.47	
Great Lakes	\$3.43	\$4.19	\$4.59	\$4.83	\$5.00	\$5.12	\$5.17	\$5.17	\$5.34	\$5.56	\$5.82	\$6.12	\$6.45	\$6.82	\$7.14	\$5.38	
Viking/ANR ML-7	\$3.43	\$4.19	\$4.59	\$4.83	\$5.00	\$5.12	\$5.17	\$5.17	\$5.34	\$5.56	\$5.82	\$6.12	\$6.45	\$6.82	\$7.14	\$5.38	
Vector	\$3.42	\$4.19	\$4.61	\$4.85	\$5.02	\$5.14	\$5.20	\$5.19	\$5.37	\$5.60	\$5.86	\$6.17	\$6.50	\$6.87	\$7.19	\$5.41	
Panhandle Field Zone	\$3.24	\$4.01	\$4.42	\$4.66	\$4.84	\$4.96	\$5.01	\$5.00	\$5.17	\$5.39	\$5.63	\$5.92	\$6.24	\$6.59	\$6.90	\$5.20	
Trunkline/Panhandle	\$3.24	\$4.01	\$4.42	\$4.66	\$4.84	\$4.96	\$5.01	\$5.00	\$5.17	\$5.39	\$5.63	\$5.92	\$6.24	\$6.59	\$6.90	\$5.20	
ANR Alliance	\$3.42	\$4.19	\$4.61	\$4.85	\$5.02	\$5.14	\$5.20	\$5.19	\$5.37	\$5.60	\$5.86	\$6.17	\$6.50	\$6.87	\$7.19	\$5.41	
ANR SW	\$3.22	\$3.98	\$4.39	\$4.63	\$4.80	\$4.92	\$4.98	\$4.96	\$5.13	\$5.35	\$5.59	\$5.88	\$6.19	\$6.54	\$6.85	\$5.16	
ANR SE	\$3.38	\$4.18	\$4.61	\$4.86	\$5.03	\$5.14	\$5.19	\$5.18	\$5.35	\$5.58	\$5.84	\$6.14	\$6.46	\$6.83	\$7.15	\$5.40	
Nexus	\$2.81	\$3.54	\$3.90	\$4.05	\$4.10	\$4.04	\$4.04	\$4.07	\$4.26	\$4.49	\$4.69	\$5.00	\$5.06	\$5.29	\$5.43	\$4.32	

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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	128,567,100
Viking/ANR ML-7	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	36,808,539
Vector	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	51,734,299
Panhandle Field Zone	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	196,555,917
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875
ANR Alliance	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	22,356,166
ANR SW	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	174,496,775
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Capacity Cost	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	663,064,671
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	736,014	865,367	934,543	975,768	1,006,659	1,027,345	1,036,710	1,035,881	1,066,039	1,105,532	1,149,819	1,201,706	1,258,154	1,321,889	1,376,859	16,098,284
Viking/ANR ML-7	467,217	531,519	565,863	586,293	601,069	611,529	616,207	615,595	630,086	649,491	671,190	697,223	725,301	757,366	784,290	9,510,239
Vector	701,507	848,094	926,396	972,931	1,006,505	1,030,334	1,041,017	1,039,618	1,072,606	1,116,842	1,166,288	1,225,598	1,289,542	1,362,616	1,423,958	16,223,852
Panhandle Field Zone	5,011,141	6,288,367	6,259,630	6,445,113	6,664,459	6,797,135	6,850,931	6,844,855	7,049,643	7,302,353	7,592,041	7,937,107	8,317,171	8,734,488	9,092,837	107,187,270
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	440,856	497,954	679,526	701,396	734,924	750,235	755,033	750,799	774,994	801,326	832,746	871,926	916,650	964,029	1,002,751	11,475,146
ANR SW	6,054,389	7,266,976	7,914,335	8,293,177	8,564,526	8,753,843	8,841,983	8,835,263	9,110,743	9,476,323	9,884,733	10,361,588	10,877,077	11,464,715	11,968,837	137,668,509
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pipeline Usage Costs	13,411,124	16,298,278	17,280,293	17,974,677	18,578,142	18,970,422	19,141,880	19,122,012	19,704,111	20,451,867	21,296,816	22,295,147	23,383,896	24,605,101	25,649,533	298,163,299
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	70,629,363	77,190,894	83,904,658	88,992,721	94,657,922	96,647,579	97,075,961	96,337,091	100,477,229	104,227,932	109,041,946	115,217,329	122,419,225	129,763,853	135,520,962	1,522,104,666
Great Lakes	36,515,633	44,430,232	48,651,148	51,195,801	53,100,552	54,401,056	54,961,735	54,889,790	56,710,214	59,099,884	61,786,452	65,018,480	68,526,174	72,490,107	75,832,825	857,610,084
Viking/ANR ML-7	26,042,385	31,732,834	34,772,155	36,580,103	37,887,692	38,813,375	39,227,320	39,173,204	40,455,569	42,172,863	44,093,113	46,396,880	48,881,723	51,719,262	54,101,971	612,050,450
Vector	62,391,982	76,507,593	84,043,434	88,453,494	91,612,240	93,816,058	94,842,087	94,763,866	97,970,705	102,226,385	106,980,640	112,531,662	118,532,425	125,373,054	131,241,495	1,481,287,118
Panhandle Field Zone	77,343,769	102,072,456	103,508,502	107,635,938	112,273,999	115,075,992	116,164,151	115,930,182	119,878,823	124,808,761	130,453,561	137,244,346	144,783,668	152,981,186	160,069,632	1,820,224,966
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	32,196,746	37,569,977	52,207,633	54,263,629	57,111,584	58,423,937	58,865,327	58,582,822	60,890,173	63,365,498	66,304,119	69,911,909	73,993,728	78,390,931	81,958,566	904,036,579
ANR SW	122,133,180	151,116,080	166,586,917	175,572,291	182,209,334	186,754,714	188,801,908	188,432,754	194,646,947	202,929,703	212,204,693	223,106,038	234,971,494	248,383,152	259,977,258	2,937,826,464
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Commodity Cost	427,253,059	520,620,066	573,674,446	602,693,978	628,853,322	643,932,711	649,938,488	648,109,709	671,029,660	698,831,025	730,864,522	769,426,644	812,108,438	859,101,546	898,702,710	10,135,140,327

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Total Gas Supply Portfolio Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	70,629,363	77,190,894	83,904,658	88,992,721	94,657,922	96,647,579	97,075,961	96,337,091	100,477,229	104,227,932	109,041,946	115,217,329	122,419,225	129,763,853	135,520,962	1,522,104,666
Great Lakes	45,822,787	53,866,739	58,156,831	60,742,709	62,678,351	63,999,542	64,569,585	64,496,811	66,347,394	68,776,555	71,507,411	74,791,325	78,355,468	82,383,136	85,780,825	1,002,275,468
Viking/ANR ML-7	28,963,505	34,718,256	37,791,921	39,620,299	40,942,663	41,878,806	42,297,429	42,242,702	43,539,558	45,276,257	47,218,205	49,548,005	52,060,927	54,930,530	57,340,164	658,369,228
Vector	66,542,443	80,804,640	88,418,783	92,875,378	96,067,698	98,295,345	99,332,057	99,252,437	102,492,264	106,792,180	111,595,881	117,206,213	123,270,921	130,184,623	136,114,407	1,549,245,268
Panhandle Field Zone	95,458,638	121,464,551	122,871,860	127,184,779	132,042,185	134,976,856	136,118,810	135,878,765	140,032,193	145,214,841	151,149,330	158,285,181	166,204,566	174,819,401	182,266,197	2,123,968,153
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875
ANR Alliance	34,128,013	39,558,342	54,377,569	56,455,436	59,336,919	60,664,583	61,110,771	60,824,033	63,155,578	65,657,235	68,627,276	72,274,246	76,400,789	80,845,371	84,451,728	937,867,890
ANR SW	139,820,687	170,016,175	186,134,371	195,498,587	202,406,978	207,141,675	209,277,008	208,901,135	215,390,808	224,039,145	233,722,544	245,100,745	257,481,690	271,480,986	283,579,213	3,249,991,747
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	484,868,495	581,122,655	635,159,051	664,872,966	691,635,775	707,107,444	713,284,680	711,436,032	734,938,082	763,487,204	796,365,650	835,926,103	879,696,645	927,910,959	930,378,738	11,096,368,296

Delivered Gas Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.45	\$4.09	\$4.45	\$4.72	\$5.02	\$5.13	\$5.15	\$5.11	\$5.33	\$5.53	\$5.79	\$6.12	\$6.50	\$6.89	\$7.19	\$5.35
Great Lakes	\$4.31	\$5.06	\$5.47	\$5.71	\$5.89	\$6.01	\$6.07	\$6.06	\$6.24	\$6.46	\$6.72	\$7.03	\$7.36	\$7.74	\$8.06	\$6.28
Viking/ANR ML-7	\$3.82	\$4.58	\$4.98	\$5.22	\$5.40	\$5.52	\$5.58	\$5.57	\$5.74	\$5.97	\$6.23	\$6.53	\$6.86	\$7.24	\$7.56	\$5.79
Vector	\$3.65	\$4.43	\$4.84	\$5.09	\$5.26	\$5.39	\$5.44	\$5.44	\$5.62	\$5.85	\$6.11	\$6.42	\$6.75	\$7.13	\$7.46	\$5.66
Panhandle Field Zone	\$3.95	\$4.76	\$5.19	\$5.45	\$5.66	\$5.79	\$5.83	\$5.82	\$6.00	\$6.22	\$6.48	\$6.78	\$7.12	\$7.49	\$7.81	\$6.01
Trunkline/Panhandle	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
ANR Alliance	\$3.61	\$4.28	\$4.72	\$4.97	\$5.23	\$5.34	\$5.38	\$5.36	\$5.56	\$5.78	\$6.04	\$6.37	\$6.73	\$7.12	\$7.44	\$5.63
ANR SW	\$3.68	\$4.48	\$4.90	\$5.15	\$5.33	\$5.46	\$5.51	\$5.50	\$5.67	\$5.90	\$6.16	\$6.46	\$6.78	\$7.15	\$7.47	\$5.71
ANR SE	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Nexus	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Average Delivered Gas Price	\$3.77	\$4.54	\$4.94	\$5.20	\$5.41	\$5.53	\$5.57	\$5.56	\$5.74	\$5.97	\$6.22	\$6.53	\$6.87	\$7.25	\$7.27	\$5.78

Total Cost By Category (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$663,064,671
Pipeline Fuel and Usage Costs	\$13,411,124	\$16,298,278	\$17,280,293	\$17,974,677	\$18,578,142	\$18,970,422	\$19,141,880	\$19,122,012	\$19,704,111	\$20,451,867	\$21,296,816	\$22,295,147	\$23,383,896	\$24,605,101	\$25,649,533	\$298,163,299
Commodity Purchase Costs	\$427,253,059	\$520,620,066	\$573,674,446	\$602,693,978	\$628,853,322	\$643,932,711	\$649,938,488	\$648,109,709	\$671,029,660	\$698,831,025	\$730,864,522	\$769,426,644	\$812,108,438	\$859,101,546	\$898,702,710	\$10,135,140,327
Total Costs	\$484,868,495	\$581,122,655	\$635,159,051	\$664,872,966	\$691,635,775	\$707,107,444	\$713,284,680	\$711,436,032	\$734,938,082	\$763,487,204	\$796,365,650	\$835,926,103	\$879,696,645	\$927,910,959	\$968,556,555	\$11,096,368,296

C.5 Projected DTE Gas Supply Portfolio Costs Without NEXUS Capacity – Rover and NEXUS Capacity Expansion Scenario

Michigan Public Service Commission																	
DTE Gas Company																	
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																	
November 2017 - October 2032																	
Nexus and Rover Scenario																	
Page 1 of 4																	
Pipeline Capacity (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Great Lakes	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	30,390	
Viking/ANR ML-7	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Panhandle Field Zone	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	83,333	
Trunkline/Panhandle	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	
ANR Alliance	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Average Pipeline Capacity	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	359,557	
Source of Supply/ Transportation																	
Utilization (Dth/Day)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	56,064	51,666	51,616	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	51,621	
Great Lakes	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	29,153	
Viking/ANR ML-7	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	20,781	
Vector	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Panhandle Field Zone	66,131	69,924	64,816	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	63,919	64,527	
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ANR Alliance	25,889	25,347	31,576	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	31,107	
ANR SW	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Average Transportation Utilization	352,018	350,871	351,942	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,581	350,781	

Michigan Public Service Commission																	
DTE Gas Company																	
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																	
November 2017 - October 2032																	
Nexus and Rover Scenario																	
Page 2 of 4																	
Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	
Viking/ANR ML-7	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	
Vector	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	
ANR SE	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%	
Great Lakes	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	
Viking/ANR ML-7	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Vector	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Panhandle Field Zone	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	
ANR Alliance	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
ANR SW	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	
Nexus	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Commodity Purchase Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	\$3.43	\$4.21	\$4.62	\$4.83	\$4.96	\$5.03	\$5.08	\$5.09	\$5.28	\$5.50	\$5.75	\$6.03	\$6.30	\$6.68	\$6.97	\$5.32	
Great Lakes	\$3.41	\$4.16	\$4.56	\$4.77	\$4.89	\$4.96	\$5.01	\$5.02	\$5.20	\$5.42	\$5.66	\$5.93	\$6.20	\$6.56	\$6.85	\$5.24	
Viking/ANR ML-7	\$3.41	\$4.16	\$4.56	\$4.77	\$4.89	\$4.96	\$5.01	\$5.02	\$5.20	\$5.42	\$5.66	\$5.93	\$6.20	\$6.56	\$6.85	\$5.24	
Vector	\$3.40	\$4.17	\$4.58	\$4.79	\$4.93	\$4.99	\$5.05	\$5.05	\$5.24	\$5.46	\$5.71	\$5.98	\$6.25	\$6.63	\$6.91	\$5.28	
Panhandle Field Zone	\$3.23	\$4.00	\$4.41	\$4.62	\$4.76	\$4.82	\$4.88	\$4.88	\$5.07	\$5.27	\$5.51	\$5.77	\$6.03	\$6.39	\$6.66	\$5.09	
Trunkline/Panhandle	\$3.23	\$4.00	\$4.41	\$4.62	\$4.76	\$4.82	\$4.88	\$4.88	\$5.07	\$5.27	\$5.51	\$5.77	\$6.03	\$6.39	\$6.66	\$5.09	
ANR Alliance	\$3.40	\$4.17	\$4.58	\$4.79	\$4.93	\$4.99	\$5.05	\$5.05	\$5.24	\$5.46	\$5.71	\$5.98	\$6.25	\$6.63	\$6.91	\$5.28	
ANR SW	\$3.21	\$3.97	\$4.38	\$4.58	\$4.72	\$4.79	\$4.85	\$4.85	\$5.03	\$5.23	\$5.47	\$5.72	\$5.98	\$6.34	\$6.61	\$5.05	
ANR SE	\$3.38	\$4.18	\$4.60	\$4.82	\$4.95	\$5.01	\$5.06	\$5.06	\$5.25	\$5.47	\$5.72	\$5.99	\$6.26	\$6.63	\$6.91	\$5.28	
Nexus	\$2.82	\$3.56	\$3.94	\$4.12	\$4.25	\$4.29	\$4.32	\$4.31	\$4.46	\$4.65	\$4.88	\$5.14	\$5.31	\$5.57	\$5.75	\$4.49	

Michigan Public Service Commission																	
DTE Gas Company																	
Projected Transportation Utilization, Reservation Costs, and Usage Costs Without NEXUS Capacity																	
November 2017 - October 2032																	
Nexus and Rover Scenario																	
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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Great Lakes	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	128,567,100	
Viking/ANR ML-7	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	36,808,539	
Vector	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	3,448,953	51,734,299	
Panhandle Field Zone	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	13,103,728	196,555,917	
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875	
ANR Alliance	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	22,356,166	
ANR SW	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	11,633,118	174,496,775	
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Pipeline Capacity Cost	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	44,204,311	663,064,671	
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total	
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Great Lakes	731,306	860,181	928,523	963,888	987,880	998,329	1,008,148	1,008,332	1,041,554	1,077,835	1,120,618	1,166,529	1,213,132	1,276,388	1,324,322	15,706,964	
Viking/ANR ML-7	465,244	529,431	563,487	581,075	592,312	597,844	602,583	602,946	618,678	637,006	658,054	681,196	704,361	735,316	759,336	9,328,869	
Vector	697,015	843,339	920,980	961,054	986,550	999,171	1,009,949	1,010,806	1,046,603	1,088,404	1,136,350	1,189,085	1,241,841	1,312,379	1,367,136	15,810,661	
Panhandle Field Zone	4,990,066	6,263,896	6,234,648	6,380,861	6,560,989	6,621,334	6,687,914	6,678,662	6,909,645	7,137,074	7,422,968	7,725,227	8,037,015	8,451,002	8,753,580	104,854,880	
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ANR Alliance	439,449	496,612	678,182	695,393	725,880	732,787	742,230	735,888	765,430	786,925	819,507	853,617	889,843	938,416	966,622	11,266,781	
ANR SW	6,027,793	7,235,851	7,876,665	8,205,408	8,415,006	8,512,773	8,602,446	8,606,657	8,909,769	9,247,482	9,642,046	10,065,584	10,491,498	11,078,038	11,521,981	134,438,995	
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Pipeline Usage Costs	13,350,872	16,229,310	17,202,484	17,787,678	18,268,615	18,462,238	18,653,270	18,643,290	19,291,679	19,974,725	20,799,544	21,681,239	22,577,689	23,791,539	24,692,977	291,407,150	
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total	
MichCon Citygate	69,974,970	76,616,268	83,401,838	87,664,244	93,014,275	93,423,237	94,762,149	93,258,535	98,438,710	101,274,920	106,463,691	111,740,597	117,461,141	124,887,559	128,472,365	1,480,854,497	
Great Lakes	36,267,694	44,169,703	48,357,871	50,538,027	52,016,822	52,690,651	53,292,610	53,313,410	55,303,127	57,543,436	60,164,064	63,028,726	65,919,748	69,753,929	72,711,037	835,070,855	
Viking/ANR ML-7	25,867,752	31,548,078	34,561,876	36,118,284	37,112,748	37,602,329	38,021,653	38,053,770	39,446,014	41,067,940	42,930,658	44,978,628	47,028,557	49,768,009	51,893,654	595,999,952	
Vector	62,082,380	76,145,267	83,604,914	87,431,779	89,871,691	91,009,791	92,053,667	92,102,679	95,631,182	99,562,461	104,155,549	109,085,908	114,043,927	120,871,788	126,039,688	1,443,692,673	
Panhandle Field Zone	77,206,967	101,833,616	103,204,699	106,549,183	110,442,419	111,852,621	113,349,628	113,092,012	117,626,788	122,026,030	127,629,682	133,557,947	139,757,948	147,942,953	153,899,046	1,779,971,537	
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ANR Alliance	32,025,947	37,391,340	51,951,853	53,575,528	56,140,781	56,650,264	57,427,133	56,909,250	59,664,169	61,713,550	64,741,022	67,895,726	71,201,340	75,678,051	78,304,678	881,270,632	
ANR SW	121,967,386	150,774,124	166,084,904	173,904,875	179,166,391	181,677,890	184,008,274	183,975,889	190,943,071	198,555,003	207,571,149	217,237,872	227,078,320	240,601,488	250,758,853	2,874,305,489	
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Commodity Cost	425,393,096	518,478,398	571,167,956	595,781,921	617,765,127	624,906,782	632,915,114	630,705,545	657,053,061	681,743,338	713,655,816	747,525,405	782,490,980	829,503,777	862,079,320	9,891,165,633	

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Total Gas Supply Portfolio Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	69,974,970	76,616,268	83,401,838	87,664,244	93,014,275	93,423,237	94,762,149	93,258,535	98,438,710	101,274,920	106,463,691	111,740,597	117,461,141	124,887,559	128,472,365	1,480,854,497
Great Lakes	45,570,139	53,601,024	57,857,534	60,073,056	61,575,842	62,260,120	62,871,899	62,892,882	64,915,821	67,192,410	69,855,823	72,766,396	75,704,020	79,601,457	82,606,499	979,344,920
Viking/ANR ML-7	28,786,899	34,531,412	37,579,266	39,153,262	40,158,963	40,654,076	41,078,138	41,110,618	42,518,595	44,158,848	46,042,615	48,113,727	50,186,820	52,957,228	55,106,893	642,137,359
Vector	66,228,349	80,437,560	87,974,847	91,841,786	94,307,194	95,457,915	96,512,569	96,562,438	100,126,738	104,099,818	108,740,852	113,723,947	118,734,722	125,633,121	130,855,776	1,511,237,633
Panhandle Field Zone	95,300,760	121,201,240	122,543,075	126,033,771	130,107,135	131,577,683	133,141,270	132,874,402	137,640,161	142,266,832	148,156,378	154,386,901	160,898,691	169,497,682	175,756,353	2,081,382,334
Trunkline/Panhandle	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	3,503,058	52,545,875
ANR Alliance	33,955,807	39,378,363	54,120,446	55,761,333	58,357,071	58,873,462	59,659,775	59,135,548	61,920,010	63,990,886	67,050,940	70,239,754	73,581,594	78,106,878	80,761,711	914,893,579
ANR SW	139,628,297	169,643,094	185,594,687	193,743,401	199,214,515	201,823,781	204,243,838	204,215,664	211,485,958	219,435,603	228,846,313	238,936,574	249,202,935	263,312,645	273,913,953	3,183,241,259
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply Portfolio Cost	482,948,279	578,912,019	632,574,751	657,773,911	680,238,053	687,573,332	695,772,696	693,553,146	720,549,052	745,922,374	778,659,671	813,410,954	849,272,981	897,499,628	900,026,045	10,845,637,456

Delivered Gas Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.42	\$4.06	\$4.43	\$4.65	\$4.94	\$4.96	\$5.03	\$4.95	\$5.22	\$5.38	\$5.65	\$5.93	\$6.23	\$6.63	\$6.82	\$5.21
Great Lakes	\$4.28	\$5.04	\$5.44	\$5.65	\$5.79	\$5.85	\$5.91	\$5.91	\$6.10	\$6.31	\$6.56	\$6.84	\$7.11	\$7.48	\$7.76	\$6.14
Viking/ANR ML-7	\$3.80	\$4.55	\$4.95	\$5.16	\$5.29	\$5.36	\$5.42	\$5.42	\$5.61	\$5.82	\$6.07	\$6.34	\$6.62	\$6.98	\$7.27	\$5.64
Vector	\$3.63	\$4.41	\$4.82	\$5.03	\$5.17	\$5.23	\$5.29	\$5.29	\$5.49	\$5.70	\$5.96	\$6.23	\$6.51	\$6.88	\$7.17	\$5.52
Panhandle Field Zone	\$3.95	\$4.75	\$5.18	\$5.40	\$5.58	\$5.64	\$5.71	\$5.70	\$5.90	\$6.10	\$6.35	\$6.62	\$6.90	\$7.27	\$7.53	\$5.89
Trunkline/Panhandle	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
ANR Alliance	\$3.59	\$4.26	\$4.70	\$4.91	\$5.14	\$5.19	\$5.25	\$5.21	\$5.45	\$5.64	\$5.91	\$6.19	\$6.48	\$6.88	\$7.11	\$5.50
ANR SW	\$3.68	\$4.47	\$4.89	\$5.10	\$5.25	\$5.32	\$5.38	\$5.38	\$5.57	\$5.78	\$6.03	\$6.29	\$6.56	\$6.94	\$7.22	\$5.59
ANR SE	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Nexus	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Average Delivered Gas Price	\$3.76	\$4.52	\$4.92	\$5.14	\$5.32	\$5.37	\$5.44	\$5.42	\$5.63	\$5.83	\$6.09	\$6.36	\$6.64	\$7.01	\$7.03	\$5.65

Total Cost By Category (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$44,204,311	\$663,064,671
Pipeline Fuel and Usage Costs	\$13,350,872	\$16,229,310	\$17,202,484	\$17,787,678	\$18,268,615	\$18,462,238	\$18,653,270	\$18,643,290	\$19,291,679	\$19,974,725	\$20,799,544	\$21,681,239	\$22,577,689	\$23,791,539	\$24,692,977	\$291,407,150
Commodity Purchase Costs	\$425,393,096	\$518,478,398	\$571,167,956	\$595,781,921	\$617,765,127	\$624,906,782	\$632,915,114	\$630,705,545	\$657,053,061	\$681,743,338	\$713,655,816	\$747,525,405	\$782,490,980	\$829,503,777	\$862,079,320	\$9,891,165,635
Total Costs	\$482,948,279	\$578,912,019	\$632,574,751	\$657,773,911	\$680,238,053	\$687,573,332	\$695,772,696	\$693,553,146	\$720,549,052	\$745,922,374	\$778,659,671	\$813,410,954	\$849,272,981	\$897,499,628	\$930,976,608	\$10,845,637,456

C.6 Projected DTE Gas Supply Portfolio Costs With NEXUS Capacity – Rover and NEXUS Capacity Expansion Scenario

[illegible]

Michigan Public Service Commission																	
DTE Gas Company																	
Projected Transportation Utilization, Reservation Costs, and Usage Costs With NEXUS Capacity																	
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Pipeline Commodity Cost (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	
Great Lakes	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	\$0.014	
Viking/ANR ML-7	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	\$0.023	
Vector	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	\$0.002	
Panhandle Field Zone	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	\$0.044	
Trunkline/Panhandle	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	\$0.026	
ANR Alliance	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	\$0.010	
ANR SW	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	
ANR SE	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	\$0.011	
Nexus	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	
Pipeline Fuel Ratio (%)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Great Lakes	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	
Viking/ANR ML-7	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Vector	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Panhandle Field Zone	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	
Trunkline/Panhandle	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	
ANR Alliance	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
ANR SW	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	
ANR SE	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	
Nexus	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Commodity Purchase Price (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average	
MichCon Citygate	\$3.43	\$4.21	\$4.62	\$4.83	\$4.96	\$5.03	\$5.08	\$5.09	\$5.28	\$5.50	\$5.75	\$6.03	\$6.30	\$6.68	\$6.97	\$5.32	
Great Lakes	\$3.41	\$4.16	\$4.56	\$4.77	\$4.89	\$4.96	\$5.01	\$5.02	\$5.20	\$5.42	\$5.66	\$5.93	\$6.20	\$6.56	\$6.85	\$5.24	
Viking/ANR ML-7	\$3.41	\$4.16	\$4.56	\$4.77	\$4.89	\$4.96	\$5.01	\$5.02	\$5.20	\$5.42	\$5.66	\$5.93	\$6.20	\$6.56	\$6.85	\$5.24	
Vector	\$3.40	\$4.17	\$4.58	\$4.79	\$4.93	\$4.99	\$5.05	\$5.05	\$5.24	\$5.46	\$5.71	\$5.98	\$6.25	\$6.63	\$6.91	\$5.28	
Panhandle Field Zone	\$3.23	\$4.00	\$4.41	\$4.62	\$4.76	\$4.82	\$4.88	\$4.88	\$5.07	\$5.27	\$5.51	\$5.77	\$6.03	\$6.39	\$6.66	\$5.09	
Trunkline/Panhandle	\$3.23	\$4.00	\$4.41	\$4.62	\$4.76	\$4.82	\$4.88	\$4.88	\$5.07	\$5.27	\$5.51	\$5.77	\$6.03	\$6.39	\$6.66	\$5.09	
ANR Alliance	\$3.40	\$4.17	\$4.58	\$4.79	\$4.93	\$4.99	\$5.05	\$5.05	\$5.24	\$5.46	\$5.71	\$5.98	\$6.25	\$6.63	\$6.91	\$5.28	
ANR SW	\$3.21	\$3.97	\$4.38	\$4.58	\$4.72	\$4.79	\$4.85	\$4.85	\$5.03	\$5.23	\$5.47	\$5.72	\$5.98	\$6.34	\$6.61	\$5.05	
ANR SE	\$3.38	\$4.18	\$4.60	\$4.82	\$4.95	\$5.01	\$5.06	\$5.06	\$5.25	\$5.47	\$5.72	\$5.99	\$6.26	\$6.63	\$6.91	\$5.28	
Nexus	\$2.82	\$3.56	\$3.94	\$4.12	\$4.25	\$4.29	\$4.32	\$4.31	\$4.46	\$4.65	\$4.88	\$5.14	\$5.31	\$5.57	\$5.75	\$4.49	

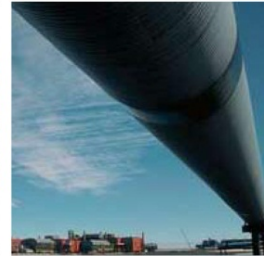
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Pipeline Capacity Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	8,571,140	128,567,100
Viking/ANR ML-7	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	2,453,903	36,808,539
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	10,876,094	163,141,411
Trunkline/Panhandle	3,503,058	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	52,519,002
ANR Alliance	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	1,490,411	22,356,166
ANR SW	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	11,073,834	166,107,507
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	19,025,625	285,384,375
Total Pipeline Capacity Cost	56,994,065	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	56,992,145	854,884,100
Pipeline Usage Costs (Commodity+Fuel) (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Great Lakes	731,306	860,181	928,523	963,888	987,880	998,329	1,008,148	1,008,332	1,041,554	1,077,835	1,120,618	1,166,529	1,213,132	1,276,388	1,324,322	15,706,964
Viking/ANR ML-7	465,244	529,431	563,487	581,075	592,312	597,844	602,583	602,946	618,678	637,006	658,054	681,196	704,361	735,316	759,336	9,328,869
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	3,916,942	4,985,844	4,846,967	4,939,441	5,100,295	5,142,987	5,197,406	5,183,623	5,371,760	5,539,617	5,763,578	5,997,295	6,244,101	6,562,240	6,789,873	81,581,969
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	353,058	398,564	573,669	586,742	610,944	617,269	625,096	619,916	644,205	663,239	690,730	719,797	750,053	791,005	814,676	9,458,964
ANR SW	5,737,995	6,887,974	7,497,979	7,810,917	8,010,438	8,103,505	8,188,867	8,192,875	8,481,415	8,802,891	9,178,486	9,581,662	9,987,099	10,545,440	10,968,040	127,975,582
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	1,397,404	1,726,284	1,901,188	1,990,197	2,044,271	2,068,656	2,091,420	2,091,587	2,171,435	2,259,988	2,363,639	2,474,495	2,586,138	2,740,044	2,856,165	32,762,910
Total Pipeline Usage Costs	12,601,949	15,388,278	16,311,813	16,872,259	17,346,141	17,528,591	17,713,519	17,699,279	18,329,047	18,980,575	19,775,106	20,620,975	21,484,882	22,650,434	23,512,411	276,815,258
Commodity Purchase Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	68,918,726	75,232,888	81,878,754	86,081,333	91,383,085	91,726,893	93,028,974	91,501,050	96,647,675	99,382,384	104,489,985	109,677,772	115,299,061	122,677,517	126,162,371	1,454,088,468
Great Lakes	36,267,694	44,169,703	48,357,871	50,538,027	52,016,822	52,690,651	53,292,610	53,313,410	55,303,127	57,543,436	60,164,064	63,028,726	65,919,748	69,753,929	72,711,037	835,070,855
Viking/ANR ML-7	25,867,752	31,548,078	34,561,876	36,118,284	37,112,748	37,602,329	38,021,653	38,053,770	39,446,014	41,067,940	42,930,658	44,978,628	47,028,557	49,768,009	51,893,654	595,999,952
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	60,630,631	81,028,282	80,135,848	82,380,761	85,857,359	86,890,650	88,115,703	87,781,583	91,464,855	94,699,482	99,083,935	103,667,077	108,581,607	114,858,845	119,337,844	1,384,514,462
Trunkline/Panhandle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANR Alliance	25,711,024	30,012,149	43,993,273	45,255,154	47,289,141	47,771,374	48,416,893	47,997,726	50,259,241	52,067,772	54,617,521	57,302,932	60,064,710	63,834,479	66,040,439	740,633,828
ANR SW	116,103,569	143,525,368	158,100,053	165,544,064	170,552,622	172,943,376	175,161,722	175,130,895	181,763,116	189,009,089	197,591,766	206,793,743	216,161,093	229,034,109	238,703,139	2,736,117,725
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	77,171,331	97,384,912	107,813,821	112,782,973	116,354,637	117,315,691	118,357,080	118,092,786	122,016,350	127,353,470	133,451,032	140,578,383	145,314,226	152,324,047	157,370,856	1,843,681,595
Total Commodity Cost	410,670,728	502,901,382	554,841,497	578,700,597	600,566,415	606,940,964	614,394,635	611,871,220	636,900,377	661,123,572	692,328,962	726,027,262	758,369,002	802,250,935	832,219,340	9,590,106,886

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Total Gas Supply Portfolio Costs (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
MichCon Citygate	68,918,726	75,232,888	81,878,754	86,081,333	91,383,085	91,726,893	93,028,974	91,501,050	96,647,675	99,382,384	104,489,985	109,677,772	115,299,061	122,677,517	126,162,371	1,454,088,468
Great Lakes	45,570,139	53,601,024	57,857,534	60,073,056	61,575,842	62,260,120	62,871,899	62,892,882	64,915,821	67,192,410	69,855,823	72,766,396	75,704,020	79,601,457	82,606,499	979,344,920
Viking/ANR ML-7	28,786,899	34,531,412	37,579,266	39,153,262	40,158,963	40,654,076	41,078,138	41,110,618	42,518,595	44,158,848	46,042,615	48,113,727	50,186,820	52,957,228	55,106,893	642,137,359
Vector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panhandle Field Zone	75,423,667	96,890,220	95,858,910	98,196,296	101,833,748	102,909,732	104,189,204	103,841,300	107,712,708	111,115,193	115,723,607	120,540,466	125,701,802	132,297,179	137,003,811	1,629,237,842
Trunkline/Panhandle	3,503,058	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	3,501,139	52,519,002
ANR Alliance	27,554,493	31,901,125	46,057,354	47,332,307	49,390,496	49,879,054	50,532,400	50,108,054	52,393,857	54,221,423	56,798,662	59,513,140	62,305,173	66,115,895	68,345,526	772,448,958
ANR SW	132,915,398	161,487,176	176,671,866	184,428,814	189,636,894	192,120,715	194,424,423	194,397,604	201,318,364	208,885,814	217,844,087	227,449,239	237,222,025	250,653,383	260,745,013	3,030,200,814
ANR SE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nexus	97,594,360	118,136,821	128,740,634	133,798,795	137,424,533	138,409,972	139,474,125	139,209,998	143,213,410	148,639,083	154,840,296	162,078,503	166,925,989	174,089,716	179,252,645	2,161,828,881
Total Gas Supply Portfolio Cost	480,266,741	575,281,805	628,145,456	652,565,002	674,904,701	681,461,700	689,100,300	686,562,644	712,221,569	737,096,293	769,096,213	803,640,382	836,846,030	881,893,513	912,723,897	10,721,806,245

Delivered Gas Price (\$/Dth)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Average
MichCon Citygate	\$3.42	\$4.05	\$4.42	\$4.64	\$4.93	\$4.95	\$5.02	\$4.93	\$5.21	\$5.36	\$5.64	\$5.92	\$6.22	\$6.62	\$6.80	\$77.96
Great Lakes	\$4.28	\$5.04	\$5.44	\$5.65	\$5.79	\$5.85	\$5.91	\$5.91	\$6.10	\$6.31	\$6.56	\$6.84	\$7.11	\$7.48	\$7.76	\$92.04
Viking/ANR ML-7	\$3.80	\$4.55	\$4.95	\$5.16	\$5.29	\$5.36	\$5.42	\$5.42	\$5.61	\$5.82	\$6.07	\$6.34	\$6.62	\$6.98	\$7.27	\$84.66
Vector	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Panhandle Field Zone	\$3.97	\$4.76	\$5.18	\$5.40	\$5.60	\$5.66	\$5.73	\$5.71	\$5.93	\$6.12	\$6.37	\$6.63	\$6.92	\$7.28	\$7.54	\$88.58
Trunkline/Panhandle	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
ANR Alliance	\$3.62	\$4.30	\$4.76	\$4.97	\$5.19	\$5.24	\$5.31	\$5.27	\$5.51	\$5.70	\$5.97	\$6.26	\$6.55	\$6.95	\$7.18	\$83.43
ANR SW	\$3.68	\$4.47	\$4.89	\$5.10	\$5.25	\$5.32	\$5.38	\$5.38	\$5.57	\$5.78	\$6.03	\$6.29	\$6.56	\$6.94	\$7.22	\$83.86
ANR SE	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Nexus	\$3.57	\$4.32	\$4.70	\$4.89	\$5.02	\$5.06	\$5.09	\$5.09	\$5.23	\$5.43	\$5.66	\$5.92	\$6.10	\$6.36	\$6.55	\$78.97
Average Delivered Gas Price	\$3.74	\$4.49	\$4.89	\$5.10	\$5.27	\$5.33	\$5.39	\$5.37	\$5.57	\$5.76	\$6.01	\$6.28	\$6.54	\$6.89	\$7.13	\$83.74

Total Cost By Category (\$)	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	15-Year Total
Pipeline Capacity Costs	\$56,994,065	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$56,992,145	\$854,884,100
Pipeline Fuel and Usage Costs	\$12,601,949	\$15,388,278	\$16,311,813	\$16,872,259	\$17,346,141	\$17,528,591	\$17,713,519	\$17,699,279	\$18,329,047	\$18,980,575	\$19,775,106	\$20,620,975	\$21,484,882	\$22,650,434	\$23,512,411	\$276,815,258
Commodity Purchase Costs	\$410,670,728	\$502,901,382	\$554,841,497	\$578,700,597	\$600,566,415	\$606,940,964	\$614,394,635	\$611,871,220	\$636,900,377	\$661,123,572	\$692,328,962	\$726,027,262	\$758,369,002	\$802,250,935	\$832,219,340	\$9,590,106,886
Total Costs	\$480,266,741	\$575,281,805	\$628,145,456	\$652,565,002	\$674,904,701	\$681,461,700	\$689,100,300	\$686,562,644	\$712,221,569	\$737,096,293	\$769,096,213	\$803,640,382	\$836,846,030	\$881,893,513	\$912,723,897	\$10,721,806,245



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