DTE

DTE Gas Company
One Energy Plaza, 1650 WCB
Detroit, MI 48226-1279

Carlton D. Watson
(313) 235-6648
carlton.watson@dteenergy.com

June 29, 2021

Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, MI 48917

RE: In the matter of the application of **DTE GAS COMPANY** for reconciliation of its gas cost recovery plan (Case No. U-20543) for the 12 months ended March 31, 2021.
MPSC Case No: U-20544

Dear Ms. Felice:

Attached for electronic filing in the above referenced matter is the DTE Gas Company's Application for Gas Cost Recovery Reconciliation and Direct Testimony and Exhibits of Witnesses, Lucian Bratu, Timothy J. Krysinski, Eric P. Schiffer, Gandolfo LoRe, and Matthew J. DeCourcey. Also attached is the Proof of Service.

Very truly yours,

Carlton D. Watson
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Date: 2021.06.29 16:15:22 -04'00'

Carlton D. Watson

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cc: Service List

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

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| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021. | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

**APPLICATION OF DTE GAS COMPANY**
**FOR GAS COST RECOVERY RECONCILIATION**

DTE Gas Company ("DTE Gas" or "Company"), files this Application for a gas cost recovery reconciliation. In support of this Application, DTE Gas states as follows:

1. DTE Gas is a subsidiary of DTE Energy Company, a Michigan corporation with its principal offices located at One Energy Plaza, Detroit, Michigan 48226. DTE Gas is a public utility, subject to the jurisdiction of the Michigan Public Service Commission ("MPSC" or "Commission") engaged in the acquisition, storage, transportation, distribution and sale of natural gas and other related services to 1.3 million residential, commercial, and industrial customers within the State of Michigan.

2. In its Opinion and Order in Case No. U-7479, dated September 20, 1983, the Commission authorized DTE Gas to incorporate into its tariff sheets a Gas Cost Recovery ("GCR") clause pursuant to 1982 PA 304 ("Act 304"). GCR factors for this twelve-month period from April 1, 2020 through March 31, 2021 were implemented by DTE Gas pursuant to its December 23, 2019 filing to reflect gas costs anticipated by DTE Gas on its customers' bills.

3. Act 304 provides that the Commission commence a GCR reconciliation proceeding to allow DTE Gas to reconcile the GCR revenue recorded with the amounts expended and included in the cost of gas sold. DTE Gas is filing this Application pursuant to the directives contained in

the Commission's Opinion and Order in Case No. U-8288, dated December 17, 1986, which addressed procedures for commencing a GCR reconciliation.

4. For the twelve-month period of April 1, 2020 through March 31, 2021, DTE Gas's total net recoverable gas supply costs for GCR customers were more than its gas supply revenues resulting in an under-recovery of approximately $5.4 million inclusive of interest through March 31, 2021. Under the Company's reconciliation methodology, the GCR and Reservation Charge revenues and expenses for GCR customers are reconciled on a combined basis, and the Reservation Charge revenues and expenses for Gas Choice Customers (GCC) are reconciled separately. DTE Gas's reservation costs for GCC customers were less than its Reservation Charge revenues resulting in an over-collection of approximately $2.0 million inclusive of interest through March 31, 2021. The exhibits and testimony of Lucian Bratu, Timothy J. Krysinski, Eric P. Schiffer, Gandolfo Lore, and Matthew DeCourcey filed by DTE Gas in support of this Application demonstrate that the Company's under-recovery for GCR and over-recovery for GCC were incurred through reasonable and prudent actions.

5. DTE Gas's twelve-month GCR reconciliation includes the roll-in of the 2019-2020 net GCR over-recovery of approximately $1 million for GCR customers and an over-recovery of approximately $1.8 million for GCC customers, which is the Company's current position in DTE Gas's 2019-2020 GCR Reconciliation Case, No. U-20236, that is currently pending before the Commission. Consistent with the Commission's prospective refund methodology approved in the Commission's June 30, 1994, Order in Case No. U-10385, the 2019-2020 net over-recoveries are included as the beginning balance for each customer class, GCR or GCC, used to calculate interest through March 31, 2021.

WHEREFORE, DTE Gas respectfully requests that a Notice of Hearing be promptly issued in this matter and that the Commission issue a final Order finding that:

a) For the twelve-month period ending March 31, 2021, DTE Gas's GCR customers' revenues of $351.9 million inclusive of Reservation Charge revenues, its Net Recoverable Costs of $358.6 million inclusive of approximately $1 million over-recovery related to 2019-2020 GCR and expenses, combined with $1.3 million of interest from 2020-2021 GCR, to result in a net under-recovery of $5.4 million for GCR customers that was incurred through reasonable and prudent actions;

b) For the twelve-month period ending March 31, 2021, DTE Gas's GCC customers Reservation Charge revenues of $6.2 million, GCC customers' $6.1 million in reservation expense, the roll-in of approximately $1.8 million related to the GCC customers' 2019-2020 reconciliation, plus $0.1 million of interest expense combine to result in a net GCC customer over-recovery of $2.0 million;

c) The calculated amount of DTE Gas's under-recoveries, together with interest, is correct, and that the disposition of that amount is consistent with the intent and in accordance with the guidelines established by the Commission in its Orders; and

d) Grant such other relief as deemed necessary.

Respectfully submitted

**DTE GAS COMPANY**

Carlton D. Watson
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By:____________________________

Carlton D. Watson (P77857)
David S. Maquera (P66228)
One Energy Plaza, WCB 1650
Detroit, Michigan 48226
(313) 235-6648

Dated: June 29, 2021

Approved:

Daniel G. Brudzynski
Digitally signed by Daniel G. Brudzynski
Date: 2021.06.29 16:20:42 -04'00'

By:____________________________

Daniel G. Brudzynski
Vice President -Gas Sales & Supply-FERC Gas

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

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| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021. | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

QUALIFICATIONS

AND

DIRECT TESTIMONY

OF

ERIC P. SCHIFFER

**DTE GAS COMPANY**
**QUALIFICATIONS OF ERIC P. SCHIFFER**

**Line No.**

**Q1. What is your name and business address?**

A1. My name is Eric P. Schiffer. My business address is One Energy Plaza, Detroit, Michigan 48226.

**Q2. By whom are you employed and in what capacity?**

A2. I am employed by DTE Gas Company (DTE Gas or Company) as a Principal Marketing Specialist.

**Q3. What is your educational background?**

A3. I earned a Bachelor of Arts Degree in Accounting from Michigan State University and a Master's Degree in Business Administration from Michigan State University. I have attended conferences related to Risk Management, the natural gas industry, gas storage outlook, the LDC Gas Forums, revenue requirements calculation, and VaR.

**Q4. What is your business experience?**

A4. I have been employed full time by DTE Gas (formerly Michigan Consolidated Gas Company), DTE Energy Corporate Services LLC, or MCN Energy Group (parent of MichCon, acquired by DTE in 2001) since 1993. From 1993 to 2001, I held various positions primarily in the non-regulatory accounting groups responsible for Oil and Gas as well as pipeline and processing plant accounting. From 2001 to 2013, I held various positions of increasing responsibility in Enterprise Risk Management, including Risk Associate for DTE Energy Trading (gas), Sarbanes Oxley Control Center lead for DTE Energy Trading and Risk Analyst (Enterprise Risk and DTE Gas). In 2013, I was promoted to Principal Supervisor responsible

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for Gas Accounting – gross margin and then in 2014, I accepted a position at DTE Energy Corporate Services LLC in Controllers – Decision Support Consolidation. In 2018, I accepted my current position. I have participated on the Gas Buyers' Panel at the LDC Gas Forums since 2019.

**Q5. What are your responsibilities as a Principal Marketing Specialist?**

A5. As a Principal Marketing Specialist, I am responsible for the purchase of natural gas and interstate transportation capacity to deliver the supply to the DTE Gas system to serve GCR customers. I am also responsible for the analysis, planning and forecasting of DTE Gas natural gas supply and transportation volumes, prices and costs, and development and administration of the fixed price program.

**Q6. Have you previously testified or submitted testimony in any Michigan Public Service Commission (MPSC or Commission) proceeding?**

A6. Yes, I filed testimony in U-20816 DTE Gas Company's 2021-22 GCR Plan, U-20543 DTE Gas Company's 2020-21 GCR Plan, U-20236 DTE Gas Company's 2019-20 GCR Reconciliation Plan, U-20235 DTE Gas Company's 2019–20 GCR Plan, and U-20210 DTE Gas Company's 2018-19 GCR Reconciliation Case. In addition, I have provided support for DTE Gas's Gas Supply witnesses for the 2017-18 GCR Reconciliation MPSC Case No. U-20076 (in which I adopted Mr. Lawshe's testimony) as well as audit and discovery requests during 2018-19 GCR Plan MPSC Case No. U-18412.

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**Purpose of Testimony**

**Q7. What is the purpose of your testimony?**

A7. I will present DTE Gas's gas supply purchases that affected the April 2020 through March 2021 operational year. I will describe the purchases that DTE Gas made for delivery during that period and the reasonable and prudent actions that the Company took while implementing its 2020-2021 GCR Plan (Plan). In summary, my testimony addresses the following comparisons to the filed Plan:

1. **Gas Supply Purchases.** Supply volumes were approximately 1.1 Bcf greater than Plan at a cost that was $5.0 million less than Plan, due to gas prices and lower transportation costs than Plan partially offset by greater GCR market requirements.
2. **Fixed-Price Gas Purchases.** DTE Gas followed its fixed-price guidelines and achieved its targeted 75% fixed-price coverage ratio at the time of filing its Plan case in December 2019.
3. **Number, Timing, and Size of Fixed-Price Gas Purchases.** The fixed-price supplies, which were executed at market prices at the time of contracting, and at the time of delivery were above that of published spot index prices by approximately $0.298/Dth (Exhibit A-2, page 12, col. (n), line 53 / line 9) , for a total cost of $31 million (Exhibit A-2, page 12, col. (n), line 53) due to unpredictable lower spot index prices. Through monthly evaluations of market conditions, the Company ensured that the number, timing, and size of its monthly fixed-price purchases were reasonable and prudent transactions to secure price stability, thereby ultimately providing price protection, price certainty, and affordability for the GCR customers.

4. **Interstate Transportation Costs.** Interstate transportation costs were approximately $1.5 million lower than Plan primarily due to credits received on Panhandle Pipeline related to Winter storm URI and unplanned capacity release credits.

5. **Interstate Transportation Contracting.** DTE's Gas Plan did not have any interstate contracts expiring during the reconciliation period. As identified in its GCR Plan Case Filing (Case U-20543), the Company replaced 60 Mdth/d (winter only) on Panhandle Eastern Pipeline with 60 Mdth/d (winter only) on ANR, contract 132461.

6. **AEP Interconnect Contracts**. The Company has an interconnect contract with MGAT to flow gas at the AEP Interconnect and it is utilizing this contract to create savings for its customers as compared to previously DTE Gas held firm transportation on the Great Lakes Gas Transmission (GLGT). In 2018 the Company allowed the GLGT contract to expire. Details of the reconciliation of those costs and the benefits of the contract are included in this filing.

7. **NEXUS Contract**. In response to the Commission's Orders in U-20210 and U-20243, the Company is providing additional supporting evidence for the NEXUS contract (including the TEAL amendment) including an updated independent analysis of the benefits of the capacity contract.

8. **Affiliate Gas Purchases.** Consistent with its Plan and prior Commission orders, DTE Gas purchased 0.5 MMDth of gas supply from its affiliate DTE Michigan Gathering Company (MGAT or MichCon Gathering) for a cost of $1.1 million at a price equal to the MichCon Monthly City Gate Spot Index, at an annual average price of approximately $2.10/Dth. As part of the VCA

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program and spot index purchases, DTE Gas purchased from its affiliate, DTE Energy Trading (DTEET), 5.4 Bcf of gas supply for a cost of $12.6 million.

**Q8. Are you sponsoring any exhibits in this proceeding?**

A8. Yes. I am sponsoring the following exhibits:

| Exhibit | Description |
|---|---|
| A-1 | NYMEX and Published Market Index Prices |
| A-2 | Fixed Price Purchases |
| A-3 | Term and Spot Purchases by Location, Supplier and Deal No. |
| A-4 | Total Purchases by Production Month |
| A-5 | Transportation Summary by Production Month |
| A-6 | Cashout Summary by Production Month |
| A-7 | Affiliate Purchase Summary |
| A-20 | $800 Meter Invoice Example |
| A-21 | $900 Meter Invoice Example |
| A-22 | $225 Meter Invoice Example |
| A-23 | U-17530 3-6-14 |
| A-24 | MGAT AEP 40104 Delivery Point Agreement dated 8.30.2017 |
| A-25 | MGAT 62078 DTE Gas ASA Nov 2014 |
| A-26 | Technology and Efficiency Gains Create A New Normal For U.S |
| A-28 | Pipeline Utilization |

**Q9. Were these exhibits prepared by you or under your direction?**

A9. Yes, they were.

**Q10. What were the components of DTE Gas's approved Plan for the 2020 - 2021 GCR operational year?**

A10. Overview. DTE Gas's approved gas supply Plan consisted of supply purchase requirements that were sourced from varying supply locations based on operational requirements and lowest delivered cost. The forecasted spot-market prices in DTE Gas's Plan were based on early December 2019 futures prices for deliveries encompassing the five-year GCR Plan period. According to its Plan, DTE Gas was to secure both "term" supply, which is a single purchase for multiple-delivery months, and "spot" supply, which is a single purchase for gas to be delivered either during the immediately-ensuing month or the immediately-ensuing day or days over the balance of the month.

**Gas Purchase Pricing**. DTE Gas's purchase plan provided for long-term fixed-price purchases under the Volume Cost Averaging method (VCA Method). The VCA Method was first approved by the Commission on September 28, 2010 in Case No. U-16146 and the same VCA purchase guidelines have been in effect ever since. The VCA Method is a timing technique of purchasing fixed-price volumes each month to be delivered over a defined period of time in the future to achieve a certain portion of supply under fixed prices by a specified date. The price for the remainder of DTE Gas's supply was intended to float with the spot market utilizing a published monthly-index price or published NYMEX settled prices, plus or minus a fixed-basis differential.

**Interstate Gas Transportation Service**. DTE Gas's Plan for its pipeline-transportation portfolio consisted of 400 MDth/day of winter and 330 MDth/day of summer firm-transport capacity for supply from the Western Canada, Mid-

Continent, and Appalachian production regions to be transported through various interstate pipelines.

**TOTAL DELIVERED VOLUME AND COST**

**Q11. What was the total delivered volume and cost of gas contained in the Plan for the 2020 – 2021 GCR year?**

A11. The total delivered volume and cost of gas as contained in the GCR Plan case U-20243 was 130 Bcf at a total cost of $373 million for an average-delivered cost of $2.88/Mcf (see Exhibit A-4, line 26). Exhibit A-4 shows the total delivered volume and cost of gas by month and compares the annual amount to the Plan for the 2020-21 GCR year.

**Q12. What was the actual delivered volume and cost of gas for the 2020-2021 GCR year?**

A12. The actual delivered volume and cost of gas was 131 Bcf at a total cost of $368 million for an average of $2.82/Mcf (see Exhibit A-4, line 24). The actual delivered volume was 1.1 Bcf greater than Plan at a total cost that was $5.0 million less than Plan, at an average cost of gas delivered that was $0.06/Mcf lower than Plan (see Exhibit A-4, line 28).

**Q13. Why were the actual volumes and costs different than Plan?**

A13. The actual delivered volume was 1.1 Bcf greater than Plan primarily due to GCC customer migration from GCC to GCR. The actual costs were $5.0 million less than Plan, which consists of commodity costs that were $3.5 million less than Plan and pipeline-transportation costs that were $1.5 million less than Plan (Exhibit A-4 line

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28, columns b and c). The actual average cost of gas delivered was $0.06/Mcf lower than Plan (Exhibit A-4, line 28, column e), which includes average commodity costs that were $0.05/Mcf lower than Plan plus average pipeline-transportation costs that were $0.02/Mcf lower than Plan. The commodity costs were lower than Plan primarily due to the costs associated with lower spot-index prices than originally forecasted in the Plan partially offset by greater purchase volumes. The transportation costs were less than Plan primarily due to pipeline credits and capacity-release revenue that were not forecasted in the Plan.

**NATURAL GAS SPOT-MARKET PRICES**

**Q14. What spot-market prices did DTE Gas forecast for the 2020-2021 GCR operational year in its supply Plan?**

A14. The forecasted spot-market prices included in DTE Gas's Plan were based on the early December 2019 market prices for deliveries that would occur during the Plan period. The forecasted-index or spot-market price for DTE Gas's floating purchases was $2.16 per Dth (U-20543, Exhibit A-10, Page 1 of 5, lines 10 plus 11 divided by lines 2 plus 3). These forecasted prices were utilized to project total gas supply costs for the portion of supply that was not locked in under term-fixed prices, which is also known as floating supply, index-priced supply, or spot-market-priced supply.

**Q15. What were the actual natural gas spot-market prices during the Reconciliation Period?**

A15. DTE Gas's actual index- or spot-market-based purchase price was approximately $2.02 per Dth (source data from Exhibit A-1, A-3, and A-7) or $0.14 per Dth lower than the forecasted level of $2.16 per Dth. Exhibit A-1 provides a detailed

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comparison of prices filed in DTE Gas's GCR Plan to actual settled-spot prices at each of DTE Gas's receipt-point locations.

**Q16. Why were actual natural gas spot-market prices $0.14 per Dth lower than forecasted?**

A16. Natural gas prices continue to remain low. The warmer than normal winter throughout the United States in 2020 coupled with global demand reductions due to COVID 19 drove gas prices down to their lowest levels since the 1990s.[1]

**DTE GAS' SUPPLY-PURCHASE REQUIREMENTS**

**Q17. What were DTE Gas's GCR Plan purchases for the April 2020 through March 2021 operational period?**

A17. DTE Gas planned to purchase a delivered volume of 130 Bcf of gas at a total cost of $373 million, or $2.88 per Mcf delivered, excluding transportation costs as shown on Exhibit A-4, line 26, columns (a), (d), and (e).

**Q18. What were the actual supply purchases for that period?**

A18. DTE Gas's actual delivered volume was 131 Bcf of gas at a total cost of $369 million, or $2.82 per Mcf delivered, excluding transportation costs as shown on Exhibit A-4, line 24. Exhibit A-3 provides a comprehensive breakdown of DTE Gas's purchases by month, by receipt point, by spot and term, by fixed and index, by supplier, and by deal number. The actual deliveries were approximately 1.1 Bcf greater than projected and $3.5 million less than projected in the original filed Plan Case as shown on Exhibit A-4, line 28, columns (a) and (b). The average purchased cost per Mcf delivered, excluding transportation costs, was approximately $0.05 per Mcf less than projected in the original filed GCR Plan, ($2.36 - $2.40 = -$.05).

**Q19. Why do both Plan, and actual total supply purchases described above differ from total supply volumes discussed in Company Witness Bratu's testimony?**

[1] https://www.eia.gov/outlooks/aeo/pdf/AEO_Narrative_2021.pdf

A19. Company Witness Bratu's testimony excludes the exchanges from its delivered purchased gas volumes whereas the total supply purchases described above includes the exchanges.

**Q20. Why were actual deliveries approximately 1.1 Bcf greater than projected in the Plan?**

A20. Actual GCR deliveries were approximately 1.1 Bcf greater than projected primarily due to customer migration from GCC to GCR during the 2020-21 GCR year and other factors that are identified in more detail by Witness Bratu.

**FIXED-PRICE PURCHASES**

**Q21. What fixed-priced-purchase supply did DTE Gas identify in its 2020-2021 GCR Plan?**

A21. DTE Gas had 103.2 MMDth of fixed-price supply in its plan to be purchased during the Reconciliation Period using the most recent Commission-approved VCA Method at a cost of $231.5 million, for an average price of $2.24 per Dth (Exhibit (Exhibit A-3, page 15, line 318)[2]. These supplies were placed under fixed-price-purchase contracts in calendar years 2018 and 2019 and were contained in Plan Case U-20543.

**Q22. What level of fixed-price purchases did DTE Gas experience during the Reconciliation Period?**

A22. The actual level of fixed-price supply was 103 MMDth of gas delivered during the Reconciliation Period at a cost of $231 million, for an average price of $2.24 per

[2] Exhibit A-2 pages 1-11 details 3rd party fixed priced purchases; Exhibit A-7 includes fixed price contracts with DTE Energy Trading. The amounts are combined on Exhibit A-3 page 15 line 318.

Dth. The actual purchase volume, costs and average price was nearly identical to the Plan except for some minor relocation of delivery points due to unforeseen pipeline outages.

**Q23. Did DTE Gas amend any existing fixed-price contracts during the Reconciliation Period?**

A23. Yes. Periodically, DTE Gas amends fixed-price contracts to change the original receipt point to an alternate receipt point for any number of operational or portfolio management reasons. The contracts that were amended are shown on lines 541 to 595 on Exhibit A-2.

**Q24. How did all of DTE Gas's fixed-price purchases compare in price to published spot-index prices?**

A24. Exhibit A-2, page 12 of 12 compares all of DTE Gas's fixed-price purchases by supply region with the published monthly spot indices of each of those regions. In total, DTE Gas purchased 103 MMDth of gas under the Commission-approved Fixed Price Purchase Guidelines described above. The price of those fixed-price supplies was more than that of published spot indices by approximately $31 million, or about $0.298 per Dth. At the time each fixed-price purchase was made, the actual time of physical delivery ranged from four to thirty-eight months in the future, and the purchase price was locked in at the market price that existed at that point in time. Distinct from the actual price paid for these purchases, the published monthly spot indices reflect the "spot-index price," which is the market price during bid week, i.e. the week immediately prior to the delivery month. Consequently, this means that the "spot-index price" reflected in the spot indices *does not reflect the facts known* *at the time when the fixed-price contracts were executed* because the "spot-index price" is not established and published until four to thirty-eight months later, when the gas was delivered.

**Q25. What are published spot-index prices?**

A25. Spot-index prices are determined by independent publishing companies that survey market participants a week before the delivery month (bid week) as to the value of gas to be delivered during the month. The spot-index prices are usually published on or around the seventh day after the start of the delivery month and are generally accepted industry wide to represent the *average value* for all deal making that occurred during the bid week period. The spot-index prices that are shown on Exhibit A-1 and Exhibit A-2, page 12 of 12, come from Platts Gas Daily Price Guide, which is published by McGraw Hill Financial.

**Q26. Did the fixed-price purchases achieve the intended objective of mitigating the impact of market-price fluctuations and price uncertainty to provide GCR-factor stability?**

A26. Yes. At the time DTE Gas filed its GCR Plan in December 2019, the expected average cost of gas purchases as stated above was $2.88/Mcf. The actual average cost of gas purchases for the 2020-2021 GCR year was $2.82/Mcf. Since 75% of its planned purchases were locked-in at fixed prices before the start of the reconciliation period, DTE Gas was able to achieve price stability for its GCR customers with actual gas costs that were $0.06/Mcf, or approximately 2%, different than what was expected at the time the Company filed its Plan case.

**Q27. How did the Company determine the number, timing and size of its fixed-price purchases?**

A27. Each month a cross-functional team worked together to determine the required purchase volumes for the remainder of the then current GCR period and the next two ensuing GCR periods. These volumes were then used to calculate the volume of fixed-price purchases required to be purchased and delivered for each of the coming seasons within the 24-month purchase-time frame of the next two ensuing GCR periods. These seasons are the summer-storage-injection season (April – October) and winter-storage-withdrawal season (November – March). These volumes were then sourced by pipeline over the remaining Fixed Price Program execution period taking into consideration key factors such as operationally-required-delivery locations and lowest-delivered-variable cost. Once approved, the gas buyer(s) request bids from multiple creditworthy suppliers and negotiate the lowest-commodity cost of gas possible at the current-market pricing. If the buyer(s) observe any unexpected price volatility or lack of liquidity on any day that purchasing is scheduled to occur, then execution of such purchases may be delayed until more stable market conditions prevail. However, no such conditions occurred and no delays in purchasing were necessary.

**Q28. Were the number, timing, and size of its monthly fixed-price purchases both reasonable and prudent?**

A28. Yes. Prior to each monthly fixed-price purchase, discussions were held with the staff of Gas Supply surrounding the number, timing, and size of the fixed-price purchases. During these meetings, any mitigating factors that may impact the monthly purchases are discussed. Mitigating factors include but are not limited to

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such things as 1) short-term weather that creates volatility and is impacting VCA gas purchases, 2) scarcity of supply liquidity, 3) questions of infrastructure availability, 4) sudden and dramatic spikes in natural gas pricing, and 5) issues of supplier credit. While this flexibility exists, no mitigating factors were identified during these meetings that caused DTE Gas to modify its planned purchases.

**Q29. Are the number, timing, and size of all the monthly fixed-price purchases calculated at the time of the GCR Plan filing in December of the preceding year?**

A29. No. Although a volume requirement is stated in the filed Plan, that requirement is updated monthly. With each successive month in the VCA purchase period, the volume to be purchased for the remainder of the VCA is calculated based on the updated supply requirements; and the specific purchase locations are based upon the remaining pipeline capacity available to be filled, the operationally-required volumes from each pipeline, and the least-variable-cost source of supply. When the final VCA purchase is made in December of the year preceding the GCR Period, the purchase volumes and locations have been updated and reviewed 24 separate times over the preceding 24 months to ensure optimization of the purchases.

**Q30. How many individual purchases over how many dates constitute the fixed-price purchases in the current reconciliation period?**

A30. During this plan year there were seventy-nine (79) individual deals. These purchases were made on forty-six (46) different trade dates, spanning a period of twenty-four months. These fixed-price purchases covered 75% of the projected Plan volumes. Conversely, the spot-month purchases made within the GCR plan period

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occurred over the 12-month period of the GCR plan for what was projected to be 25% of the projected-Plan volumes. Taken together, the fixed-price purchases and the spot purchases were spread out over a 36-month period to provide a greater stability of pricing than if all gas volumes were purchased solely within the confines of the 12 months of the GCR plan period. This information is displayed on Exhibit A-2, pages 1 through 11.

**Q31. What other actions did the Company take to ensure that the number, timing, and size of its monthly fixed-price purchases were reasonable and prudent at the time of execution?**

A31. The gas buyers for the Company regularly read industry trade publications and are in regular contact with many potential suppliers on an almost daily basis to gather pricing data and market intelligence. Additionally, these gas buyers continuously monitor data from a real-time NYMEX feed with natural gas-futures pricing and industry news that is updated continuously throughout the day. During this Plan year at the time of execution, no mitigating factors for the number, timing, and size of purchases were identified that would cause the gas buyers to abstain from transacting.

**Q32. Was it reasonable and prudent for DTE Gas to lock in the price of this supply?**

A32. Yes. At the time that these fixed-price purchases were transacted under the VCA program, each transaction was first evaluated regarding operational need and then on lowest cost of supply as calculated based on the then-current NYMEX-future-months and market-area-basis projections. Once these parameters were established for each season – either April through October or November through March – within the two future GCR periods following the period currently in progress, then several purchases were transacted for 1/24th of the projected requirements during that period. At the time each contract was entered into, the fixed price that DTE Gas locked in was in fact the market price for that delivery period, based on competing bids and other market intelligence at that time, as identified above; and the quantity of fixed-price gas that DTE Gas locked in was in fact 1/24th of projected requirements based on the most recent sales forecast at that time. Further, there were no compelling circumstances, such as events of force majeure, hurricanes, national or natural disasters, extensive national pipeline disruptions, or information available at the time these decisions were made that indicated that DTE Gas should deviate from its filed Fixed Price Purchase Guidelines. Accordingly, DTE Gas locked in the price of this supply consistent with its Commission-approved Fixed Price Purchase Guidelines. Consequently, the fixed-price portfolio provided price certainty for customers and eliminated future-price risk.

## SPOT-MARKET-PRICED PURCHASES (NOT-FIXED PRICE)

**Q33. What types of spot-market-price methods were included in DTE Gas's Commission-approved GCR Plan for gas purchases?**

A33. The Commission-approved Plan established the price for the remainder of DTE Gas's supply not under fixed-price contracts to float with the spot market utilizing a published monthly-index price or published NYMEX-settled prices plus or minus a fixed-basis differential. Physical-basis price accounts for the geographical difference in price between the NYMEX Henry Hub price in Louisiana and the specified geographical location where the gas was purchased, such as another production or market region. The monthly settled-index price for each location where gas is purchased represents the spot price of natural gas for the delivery month at that location and it is based on the average transacted spot price for each location that occurred during the last week of trading just prior to the start of delivery.

**Q34. What types of spot-market-based price methodologies did DTE Gas utilize during the Reconciliation Period?**

A34. DTE Gas purchased all spot-market-based-price supply utilizing published-index prices.

**Q35. What supply did DTE Gas forecast in its Plan under spot-market pricing?**

A35. DTE Gas planned to purchase 37 MMDth of gas under spot-market-priced purchases at a forecasted cost of $79.8 million, for an average price of $2.16 per Dth (Case No. U-20543, Exhibit A-10, column 14, lines (10 + 11)/(2+3)).

**Q36. What was the actual gas supply quantity purchased under spot-market pricing?**

A36. DTE Gas purchased 37 MMDth of spot-market-index-priced gas at a total cost of $75.6 million, at an average price of $2.07 per Dth (Exhibit A-3, line 317). The actual spot-priced purchases were approximately 0.5 MMDth lower and $4.2 million less than projected in the original filed Plan Case. The average purchase price was approximately $0.09 per Dth less than projected in the original filed Plan Case.

**Q37. Why were DTE Gas's spot-market-based index-price purchases different than Plan?**

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A37. At the time of the GCR Plan filing, DTE Gas's projection of spot-market-based pricing was based on the market outlook in early December 2019. However, at the time these purchases were executed, the actual spot-market prices were $0.09 /Dth lower than the December 2019 forecast. Also, spot-market-based index-price purchases were approximately 0.5 MMDth less than projected, primarily due to warmer-than-normal weather in the 2019-20 GCR year.

**TRANSPORTATION PORTFOLIO CHANGES**

**Q38. What changes has DTE Gas made to its interstate-pipeline capacity since its 2019-20 GCR Plan Filing?**

A38. DTE Gas did not make any changes to its transport portfolio during the reconciliation period that were not identified in the prior GCR Plan filing. However, the next few sections discuss the changes to the transport portfolio that fully materialized during this reconciliation period.

**AEP GAYLORD INTERCONNECT CONTRACTS**

**Q39. Does the Company have any interconnect contracts related to the AEP Pipeline?**

A39. Yes, the Company has contracts associated with the AEP Gaylord Interconnect.

**Q40. How many contracts are associated with the AEP Gaylord Interconnect?**

A40. There are two contracts associated with the interconnect. Contract ASAT62078 (Exhibit A-25) is for transportation and contract 40104 (Exhibit A-24) is for the Gaylord receipt point.

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**Q41. What fees are currently associated with the AEP Gaylord Interconnect contracts?**

A41. DTE Gas pays DTE Gathering monthly fees totaling $1,100/ month to Michigan Gathering Company (MGAT). This includes $800/month for the AEP Gaylord Interconnect receipt point and a second monthly fee of $300/month for transportation service as an Administrative Fee plus $0.035/Mcf for gas transported.

**Q42. Why did DTE Gas start incurring these costs?**

A42. As the Company described in Case No. U-18152, DTE Gas allowed the Great Lakes Gas Transmission (GLGT) backhaul contract to expire on March 31, 2017. The 50,000 Dth/day of expired GLGT service to the DTE Gas Gaylord Transmission System was replaced with a new AEP Gaylord Interconnect and transportation service on the DTE Gathering Company AEP Pipeline. The costs associated with the GLGT contract consisted of $416,900/month in reservation charges plus $0.0105/Dth transport fees. With an estimated usage of approximately 1.6 Bcf/Year, based on historical usage over the 36-month period ending March 2016, continued service under the GLGT backhaul contract would cost approximately $5.0 million/year. The combined cost under the AEP and DTE Gathering contracts at the same 1.6 Bcf/Year usage would be approximately $0.1 million/year, for a total cost savings of approximately $4.9 million/year for GCR and GCC customers. The Commission approved this contract within the settlement agreement in its December 7, 2017 order in Case No. U-18152 at page 2.

**Q43. When was the first time the monthly interconnect and transportation administration fees were recovered in a GCR reconciliation?**

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A43. The fees were effective when the meter went online, which was in November 2017, and the Commission approved recovery of those fees in its reconciliation settled on July 18, 2019 in Case No. U-20076.

**Q44. Were the costs associated with the MGAT contracts included in DTE Gas's requested recovery amounts in U-20076 and U-20210?**

A44. No, costs associated with the MGAT contracts were not included in the U-20076 reconciliation case. MGAT erroneously did not start billing DTE Gas when the interconnection went into service, and DTE Gas erroneously did not accrue for such costs, either. MGAT began billing the $800 fee (but not the $300 fee) beginning in June 2018, these fees were addressed initially in the U-20210 reconciliation case. During the U-20210 reconciliation, Staff noticed the additional $800 charge that MGAT began billing and asked for clarification. As the Company was providing the appropriate contracts and assisting Staff with understanding the charges, DTE Gas and MGAT realized that the additional $300 fee was not being charged. MGAT subsequently backbilled the Company $300 for each of the 24 months that it was allowed to adjust bills (based on the contract terms). The contract is attached as Exhibits A-24 MGAT 62078 DTE Gas ASA Nov_2014 ($300 fee) and A-25MGAT AEP 40104 Delivery Pt Agreement 8.30.17 ($800 fee).

**Q45. Has the Commission issued an Order approving recovery of these costs?**

A45. No. Case U-20076 did not have any of the costs related to the agreement in it. As described above, Case U-20210 only had the $800 interconnection fee. The Order in that case states that DTE Gas "failed to meet the burden of reasonableness for the

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fees." This testimony provides the support to meet the threshold for the both the $800 interconnection fee and the $300 administrative fee.

**Q46. When DTE Gas executed the contract with MGAT, was DTE Gas required to file an Act 9 for its transportation capacity?**

A46. No, DTE Gas transports natural gas on the pipeline and it is my understanding that Act 9s are required to be filed by the pipeline company providing the service. Therefore, it is MGAT's responsibility to file for regulatory approval. It is not the shipper's responsibility.

**Q47. Is MGAT owned by DTE Gas?**

A47. No, MGAT is not owned by DTE Gas, but by an affiliated company of DTE Gas. Therefore, MGAT is also an affiliate of DTE Gas and transactions between the two companies are governed by the Code of Conduct.

**Q48. Is DTE Gas aware if MGAT is filing or has filed an Act 9 for the AEP contract since the issue was identified?**

A48. Yes, MGAT filed an ACT 9 case on March 17, 2021, in docket no. U-20994 after it was made aware of the oversight. In that case, MGAT seeks Commission approval for the contract between MGAT and DTE Gas.

**Q49. In Case No. U-20210, the Commission, Staff and the ALJ referenced the settlement involving MGAT in Case No. U-17530. How is that settlement relevant to this case?**

A49. The settlement in Case No. U-17530 is not relevant to this case as it sets the fee for Remote Metering Stations (RMS). Because MGAT had not previously filed (with the MPSC) for approval of the contract executed with DTE Gas, confusion arose regarding whether the terms of that settlement governed interconnects as well as RMS.

**Q50. Do you believe that the interconnect and transport agreement between DTE Gas and MGAT covers the same subject matter as the RMS in MGAT's settlement agreement in Case No. U-17530?**

A50. No. The settlement agreement addressed RMS only. We know this because in Exhibit A-23, on page 2 of the Order in Case U-17530, MGAT's ex parte request for a new gas transportation agreement, it explicitly identifies that receipt point meters that are an integral part of the AEP transportation system would be reduced from a range $450-$600 per month to $225. The application in U-17530 was filed on December 23, 2013 with an Order being issued on March 6, 2014. The facilities at issue in this case are interconnection locations. These are two very different types of facilities, as DTE Gas and MGAT entered into an agreement in 2017 with an interconnection being built and going into service in 2017, three years after the Order was issued. Clearly, this interconnection is not an "integral part of the AEP transportation system" that the Order was referring to.

**Q51. What is the difference between interconnection locations and remote metering stations?**

A51. Interconnection locations such as the Gaylord delivery point are significant facilities that have a robust flow computer and controller system, which link to various gas quality monitoring devices. The meter is usually an ultrasonic meter instead of an orifice meter for more current installations and flows pipeline quality gas. These stations typically will include monitoring devices including a filter separator, gas chromatograph (monitors the gas quality/components on a continuous basis), hydrocarbon dew point monitor (makes sure that gas meets the required level for dew point – so liquid dropout is avoided), oxygen monitor (verifies oxygen levels are within specification), sulfur monitor (H2S or total sulfur depending on what components are expected), and moisture analyzers (entrained water vapor content) among other things that may be required at specific locations. These are designed to monitor components, to verify gas quality and react in real time to stop flow if specifications are not met. These facilities typically are large building(s) about 10' x 10' or larger and have logic controllers and automated valves to perform shut in for quality or other reasons. See photo of Gaylord interconnection below:


These stations are also typically part of the SCADA system and have utility electric connections. Each of the components has different maintenance and material requirements for normal operation and maintenance including components such as test and purge gas cylinders for the chromatograph. These stations typically cost in

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excess of $500,000 to construct. The particular facility at issue in this case cost $2.6 million to construct. These are also typically fenced-in locations.

In contrast, RMS locations are very simple stations that are typically designed only to measure the gas stream flowing through the facility. These facilities are designed to measure production gas flowing from producer locations into the gathering pipeline system, which passes through downstream gas treatment facilities to create pipeline quality gas for delivery to markets. They typically include a small building about 6' x 6' containing a simple flow computer to record and calculate the volume passing through the meter and the meter itself (typically orifice type) with a communication link to send the measurement data to the measurement group. See photo of a typical RMS location below:

For Antrim gas, samples are taken typically on a monthly basis to determine the gas quality used for all calculations at the meter station. The meters are typically

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calibrated quarterly. These stations may not have access to grid power and a large number are run with solar panels and batteries. These stations typically are about $150,000 to construct.

**Q52. What section of the Code of Conduct rules would you look to when evaluating if there is a violation?**

A52. The relevant section is in Part 3 subsection (4). This Subsection discusses the compensation for services or products regulated and non-regulated affiliates procure from one another.

**Q53. Do you think that the $800 monthly fee is in excess of fully allocated embedded costs plus 10%?**

A53. No, as discussed previously in question 51, the interconnection requires various monitors ensuring the inflowing gas to ensure that it meets pipeline quality specifications in real-time. In MGAT's application in Docket U-20994, it explains in Paragraph 7 the complexities of the station:

> *Interconnection locations such as the AEP Gaylord Interconnect include measurement equipment and have a robust flow computer and controller system, which is also linked to various gas quality monitoring devices. The meter is usually an ultrasonic meter instead of an orifice meter for more current installations and flows pipeline quality gas. These stations typically will include monitoring devices including a filter separator, gas chromatograph (monitors the gas quality / components on a continuous basis), hydrocarbon dew point monitor (makes sure that gas meets the required level for dew point – so liquid dropout is avoided), oxygen monitor (verifies oxygen levels are within specification), sulfur monitor (H2S or total sulfur depending on what components are expected), and moisture analyzers (entrained water vapor content) among 3 other things that may be required at specific locations. These are designed to monitor*

> *components to verify gas quality and react in real time to stop flow if specifications are not met. These typically are larger building(s) ~ 10' x 10' or larger and have additional logic controllers and automated valves to perform shut in for quality or other reasons. These stations are also typically part of the SCADA system and have utility electric connections. Each of the components has different maintenance and material requirements for normal operation and maintenance including components such as test and purge gas cylinders for the chromatograph. These stations typically cost in excess of $500,000 to construct. These are also typically fenced in locations.*

**Q54. Do you believe that the costs associated with these contracts exceed market prices?**

A54. No. Nor does the $225 fee agreed to in the settlement agreement set the market price for these services. As explained above, that was an agreed upon fee for a specific type of receipt point that is smaller in scale, with fewer requirements, which is not monitored continuously and was integral to the AEP system, versus an interconnection that added to the system and is larger in scale with multiple monitoring features that ensures pipeline quality gas enters into the DTE Gas system and that is capable of stopping the flow if gas does not meet specifications.

**Q55. Is there some other evidence of what market price is for this type of interconnection facility?**

A55. Yes. We produced evidence of the amount MGAT charges non-affiliated companies for similar facilities and these can be found in Exhibits A-20, A-21 and A-22 (three examples of different priced meters).

**Q56. Was the agreement between DTE Gas and MGAT executed before or after MGAT agreed to the settlement in Case No. U-17530?**

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No.

A56. After.

**Q57. Do you believe this contract was entered into by two willing parties and negotiated in good faith?**

A57. Yes.

**Q58. Did DTE Gas pay for and build the Gaylord Interconnection?**

A58. Yes, DTE Gas built the Gaylord Interconnection and is recovering the capital costs in base rates.

**Q59. Who is the operator of the Gaylord Interconnection facility?**

A59. MGAT.

**Q60. Does MGAT incur operating and maintenance costs for the facility?**

A60. Not directly. MGAT has contracted with DTE Gas for this service. DTE Gas is charging MGAT for operating service expenses incurred.

**Q61. Does DTE Gas have any similar facilities into its transmission system.**

A61. Yes.

**Q62. Did the upstream party pay for construction of the facilities at these locations?**

A62. Yes.

**Q63. Do the producers pay for any receipt point fees?**

A63. Yes, they pay a base fee of $800 (or more depending on the size and scope of the facility) for operating and maintaining the facility.

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**Q64. In addition to the $800 interconnection receipt point fee, is there any other cost associated with the contract?**

A64. Yes. In addition to the $800 interconnection receipt point fee, the contract includes a $300 administration fee. Unlike the interconnection receipt point fee, the $300 administration fee is governed by the settlement agreement in Case No. U-17530, which specifies that every contract will include a $300 administration fee, in paragraph 5.1.1 of the settlement agreement.

**Q65. Please explain why it is reasonable for MGAT to charge DTE Gas an administration fee when DTE Gas operates the system for MGAT?**

A65. Pursuant to a service agreement between MGAT and DTE Gas, DTE Gas provides MGAT with physical operations services on the assets (TSO group, Corrosion, Control Techs, etc.), gas nominations services, measurement services, gas control services, sampling analysis with field providing samples to the laboratory services team. There are reporting and response oversight functions as well via the integrity group, codes team, engineering and others. This is all covered currently under an intercompany services agreement between DTE Gas and various DTE Midstream entities. The administration fee that MGAT charges is under the approved base transportation agreement and is charged per contract for any shipper on the system, affiliate or not, operator or not. Shippers for convenience may have multiple agreements and pay multiple fees if they do choose to have more than one agreement.

**Q66. Where are these monthly fees included in the cost of gas?**

A66. The $1,100 of monthly costs that are described in question 41 above are embedded in the reservation costs associated with AEP and can be found on line 22 of Exhibit A-5 of my direct testimony. The costs associated with utilizing the AEP Interconnect are included in the $60 million of total transportation costs during the reconciliation period. (Exhibit A-5, Page 1, line 28, column N).

## NEXUS PIPELINE

**Q67. When did DTE Gas first introduce NEXUS to the MPSC?**

A67. DTE Gas first introduced the NEXUS pipeline project in Case U-17691, DTE Gas's 2015-2016 GCR Plan case. During that case, the Company utilized analysis provided by ICF Resources (report dated December 2014 and updated December 2015).

**Q68. Why did DTE Gas select NEXUS transport capacity to secure gas supply from the Utica and Marcellus production region?**

A68. DTE Gas selected NEXUS because it provided the lowest delivered cost of gas on a greenfield pipeline from the Utica and Marcellus regions. DTE Gas agreed to be an anchor shipper on NEXUS and helped provide the support needed for NEXUS to get FERC approval to proceed with the new greenfield project.

**Q69. What rate does DTE Gas pay for NEXUS transportation service?**

A69. $0.695/Dth reservation charge plus 1.32% for fuel. There are no additional commodity charges associated with the service.

**Q70. What is the rationale for the $0.695/Dth and is it competitive and reasonable?**

A70. See Exhibit A-26 showing the NEXUS Tariff Rate for Market Zone 1 to Market Zone 1 of $24.841/Dth/month or $0.8167 / Dth/day ((24.841 x 12) / 365), which is the tariff rate for the Kensington to Ypsilanti transportation path held by DTE Gas. In addition, there is a usage charge of $0.0057 / Dth / day as seen in Exhibit A-26. The DTE Gas negotiated rate of $0.695/Dth (without any usage charge) is reasonable because it is $0.1274/Dth less, or 5.5% less, than the tariff rate approved by FERC. This is an annual savings of $3.5 million ((($0.8167+$0.0057-$0.695) x 75,000 x 365).

**Q71. Is the rate DTE Gas negotiated in line with what other anchor shippers are paying for NEXUS transportation service?**

A71. No, it is anticipated to be lower than other anchor shippers. The other anchor shippers negotiated variable rate contracts for $0.635 Dth/day and $0.65 Dth day with capital trackers (capped at 15% or or $0.09 - $0.10 incremental or decremental costs). Costs increases between 20-30% have been reported on NEXUS therefore it is anticipated final rates will be ~ $0.73 Dth/d and $0.7475 Dth/d for the variable rate contract.

**Q72. How did DTE Gas contract for the $0.695 rate for 15 years?**

A72. DTE Gas submitted a bid on NEXUS' open season. The open season terms required a minimum of 15 years. During the negotiations there were two primary alternatives: Fixed price for the entire 15 years or a rate that could be adjusted based on a capital tracking mechanism related to the greenfield portion of the pipeline. As the project was for a 250-mile greenfield pipeline, DTE Gas desired a fixed price for the contract for cost certainty and to avoid the risk of a rate increase associated with potential cost over-runs.

**Q73. Does this rate allow for a known or measurable cost?**

A73. Yes, DTE negotiated a fixed rate and any risk of cost overruns would be borne by NEXUS and not DTE Gas's customers.

**Q74. Looking back, were there any cost overruns?**

A74. Yes. Per the FERC order approving the NEXUS pipeline, the anticipated costs of the pipe were approximately $2.1 billion, however based on Enbridge's 10-Q dated September 30, 2018 the estimated capital cost is now $2.6 billion. This leads me to believe that there is $500 million of cost overruns, which is approximately 24%. It is safe to say that DTE Gas customers are better off locking in the fixed price versus including the capital tracker, which would have had them paying for a share of those significant overruns.

**Q75. Was there any other benefit acquired in the negotiated rate with NEXUS?**

A75. Yes. DTE Gas was able to acquire a most favored nation provision in the Precedent Agreement. This provision guaranteed DTE Gas would be able to match any rate that is lower than the $0.695/Dth if NEXUS entered into such an agreement with a similarly situated shipper prior to the in-service date of the pipeline. Prior to NEXUS going into service, there were no other shippers that negotiated lower rates than DTE Gas.

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**Q76. Are there any additional costs associated with the NEXUS contract?**

A76. Yes. In 2018 DTE Gas amended the contract to allow for 37,500 / Dth to be received at Clarington (75 miles south) instead of Kensington. This increased the costs by $0.15 / Dth /d plus fuel.

**Q77. How was the $0.15/Dth determined?**

A77. It is the difference in maximum tariff rates between supply zone (where Clarington is located in) to market zone 1 (where Kensington is located in) and within market zone 1 (Kensington to Ypsilanti).

**Q78. Would you consider this the market rate for this transportation?**

A78. Yes, I would. All the anchor shippers were offered to contract for up to 50% of its maximum daily quantity for the $0.15. All executed amendments at this rate.

**Q79. Is the natural gas market the same in 2021 as it was during the time of the original ICF report?**

A79. No, back in 2014/2015 the report projected gas prices to be between $5-10/Dth over the life of the NEXUS contract. In 2021, forward prices have reduced to $2 – 5/Dth over the life of the NEXUS contract.

**Q80. How have NYMEX prices changed between 2014/2015 and the present?**

A80. The April 2015 to March 2016 NYMEX price presented in U-17691 Exhibit A-8 was between $3.50 - 4.00 (page 1), the 5th-year of the 5-year forecast in that case (April 2019 to March 2020) was between $4.15 - 4.60 (page 5), and looking at the forecasts at the time, it was anticipated that natural gas prices would continue to rise.

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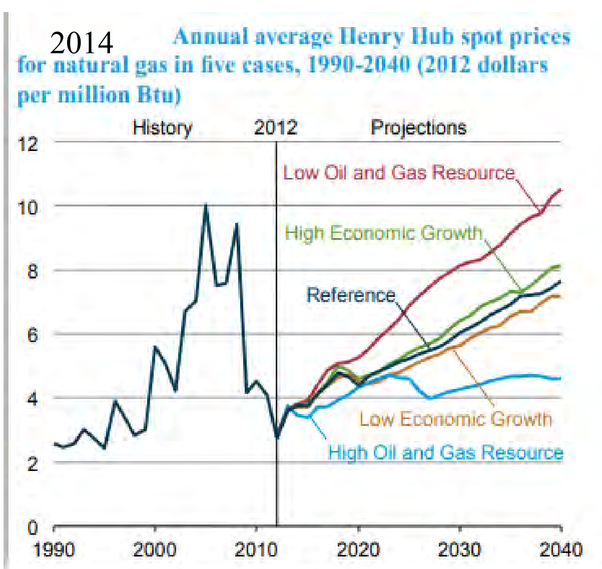
Contrast that with the NYMEX price outlook the Company filed in Case U-20543 Exhibit A-8, DTE Gas's 2020 - 2021 GCR case, in which the prices are more tightly bound in a $2.19 - $2.71 (page 1) range and the long-term outlook does not forecast prices to increase as dramatically.

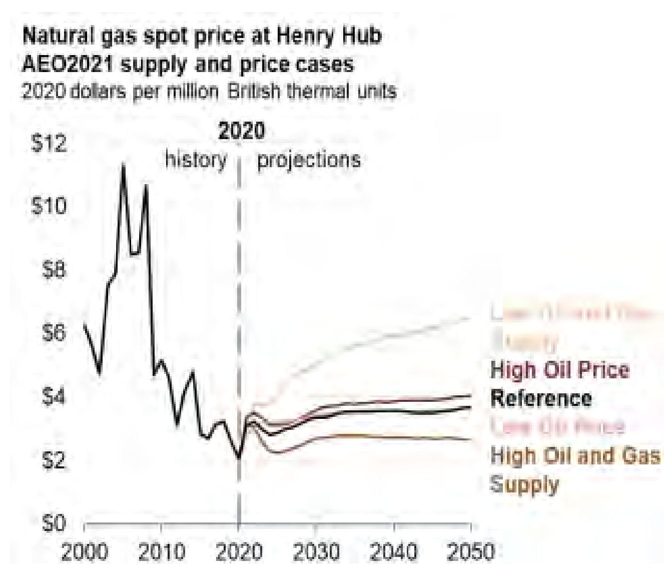
**Q81. What factors are driving this price decrease?**

A81. During the past six years, we have seen both improvements in technology as well as significant additional reserves that have dampened the outlook on the rise of natural gas prices. Due to this dynamic market shift, DTE Gas has contracted with FTI Consulting in order to refresh the analysis that ICF produced in order to get an updated look at the benefits of the NEXUS agreement.

**Q82. Are there any long-term projections showing this shift in market prices and production?**

A82. Yes. The EIA annually publishes a long-term forecast for natural gas prices and in 2014[3] the projections were showing higher prices versus 2021.[4] As can be seen in

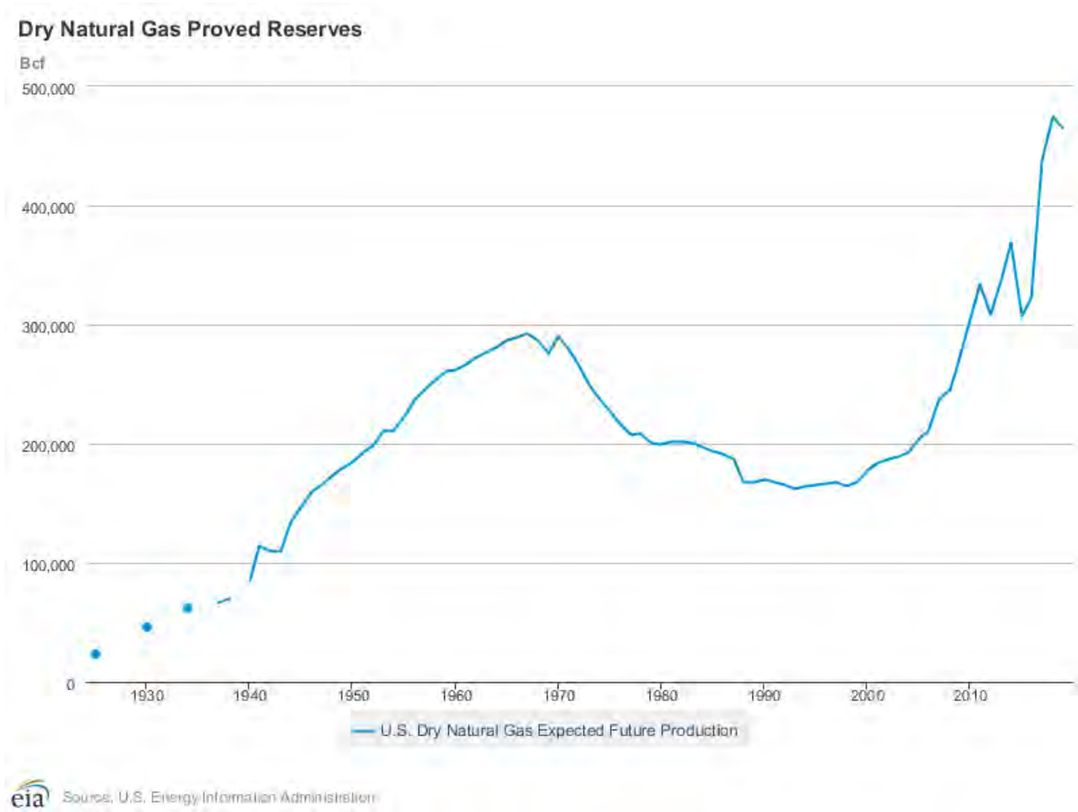



[3] https://www.eia.gov/outlooks/archive/aeo14/pdf/0383(2014).pdf
[4] https://www.eia.gov/outlooks/aeo/pdf/AEO_Narrative_2021.pdf

the tables below, back in 2014 when DTEG was initially looking at NEXUS, gas prices were expected to steadily rise. In comparison, when you review the 2021 table, gas prices and the related projections have flattened out.

Conversely when you review the following two tables from the same two reports you see that the projected production of natural gas has significantly increased (key is the y axis scale).




Also the EIA shows that U.S. proved reserves has increased over 26% from almost 369 Tcf to over 465 Tcf from year end 2014 to year end 2019.[5]

The combination of increased reserves and production has put downward pressure on natural gas prices.

[5] https://www.eia.gov/dnav/ng/NG_ENR_DRY_A_EPG0_R11_BCF_A.htm

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The changes to the industry came after the analysis that ICF completed in 2014, as in Exhibit A - 26 Technology And Efficiency Gains Create A _New Normal_ For U.S describes that beginning in mid-2013 and for three years Texas's oil production was dormant and then increased by 50% from 4.2 bcf/d to approximately 6.5 bcd/d in one year (2017 to 2018).

**Q83. Are technological improvements causing the production numbers to increase?**

A83. Yes, the article in Exhibit A - 32 attributes the technological improvements to two main drivers for this production increase. The first is that producers have cut down the time to drill, frac and complete each well from 25-30 days down to 10-12 days. This almost doubles the output of each active rig.

Secondly, productivity gains per well have dramatically improved. Drilling, fracking, and completion technologies have advanced to provide the industry with more powerful rigs that can drill longer laterals. In addition, the advancements in analysis tools for identifying gas underneath the ground have allowed producers to drill into the formation's more prolific areas or "sweet spot" more accurately. On the fracking side, improvements in the fluids used have resulted in better fracking of the rocks, which allows for more gas and liquids to be recovered.

**Q84. Is this technological improvement isolated to Texas?**

A84. No, the improvements and efficiencies are not isolated to Texas and the benefits shown in Texas are also seen across the entire industry.

**Q85. Has the MichCon city-gate index experienced any fundamental changes in its makeup?**

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No.

A85. Yes. The MichCon city-gate index has historically traded at a premium to the NYMEX with a higher premium in the winter than the summer. As the Appalachian gas has increased supply to the region, the MichCon index has continued to decline, and essentially flipped from premium to a discount to the NYMEX index. (See table below with settled prices through March 2021 (end of reconciliation period)).

| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|
| | NYMEX | MichCon CityGate | Premium / (Discount) | | NYMEX | MichCon City Gate | Premium / (Discount) |
| 1 summer 2010 | $ 4.178 | $ 4.327 | $ 0.149 | Winter 10-11 | $ 3.977 | $ 4.194 | $ 0.217 |
| 2 summer 2011 | 4.184 | 4.420 | 0.236 | Winter 11-12 | 3.019 | 3.242 | 0.223 |
| 3 summer 2012 | 2.585 | 2.709 | 0.124 | Winter 12-13 | 3.435 | 3.630 | 0.195 |
| 4 summer 2013 | 3.787 | 4.007 | 0.220 | Winter 13-14 | 4.427 | 6.102 | 1.675 |
| 5 summer 2014 | 4.307 | 4.523 | 0.216 | Winter 14-15 | 3.392 | 3.718 | 0.326 |
| 6 summer 2015 | 2.683 | 2.840 | 0.157 | Winter 15-16 | 2.093 | 2.258 | 0.165 |
| 7 summer 2016 | 2.465 | 2.449 | (0.016) | Winter 16-17 | 3.189 | 3.210 | 0.021 |
| 8 summer 2017 | 3.075 | 2.973 | (0.102) | Winter 17-18 | 2.967 | 2.856 | (0.111) |
| 9 summer 2018 | 2.874 | 2.763 | (0.111) | Winter 18-19 | 3.469 | 3.434 | (0.035) |
| 10 summer 2019 | 2.432 | 2.200 | (0.232) | Winter 19-20 | 2.185 | 2.052 | (0.133) |
| 11 summer 2020 | 1.883 | 1.717 | (0.166) | Winter 20-21 | 2.791 | 2.582 | (0.209) |
| 12 summer 2021 | 2.539 | 2.352 | (0.187) | Winter 21-22 | 2.807 | 2.658 | (0.149) |
| 13 summer 2022 | 2.528 | 2.355 | (0.173) | Winter 22-23 | 2.811 | 2.666 | (0.145) |
| 14 summer 2023 | 2.608 | 2.435 | (0.173) | Winter 23-24 | 2.926 | 2.811 | (0.116) |
| 15 summer 2024 | 2.714 | 2.584 | (0.130) | Winter 24-25 | 3.010 | 2.897 | (0.113) |
| 16 summer 2025 | 2.840 | 2.707 | (0.133) | Winter 25-26 | 3.138 | 3.069 | (0.069) |

The table separates average summer (A-D) versus average winter prices (E-H) by each GCR year. Columns A & F are the NYMEX prices, C & G are the MichCon CityGate Index and D&H (premium /discount to NYMEX). Rows 1-7 of the table show the historical summer pricing differential being a premium of $0.123-$0.224 and winter premium being $0.156- $1.721 (which was the year of sustained Polar Vortex). Rows 8-17 of the table shows that the MichCon index is now trading at a discount of ($0.102) – ($0.22) in the summer and ($0.035) – ($0.17) in the winter with the increased Appalachian supply into the state. Thus, customers are benefitting not just from the discount from the NYMEX, but also from the elimination of the premium from the NYMEX experienced historically.

**Q86. How is the Company addressing the concerns expressed by the Commission that the Company has not provided new data or updated the 2014 analysis on NEXUS and its impact on the Michigan natural gas market?**

A86. The Company engaged FTI Consulting (FTI) to review the market dynamics and evaluate the benefits of the NEXUS pipeline. The scope of work was to develop historical simulations of the Upper Midwest gas markets since NEXUS went into service and then review the model in a simulation where NEXUS was not built, thus providing an "ex post" analysis of the Michigan gas market.

**Q87. Has DTE Gas provided this analysis before?**

A87. No. DTE Gas has the ability to look forward and analyze the environment based on current infrastructure and utilizing forward curves to value pipelines. The Company does not have the resources or expertise to do the complex what-if modelling of the natural gas marketplace that takes into account new projects that impact supply and demand levels or similarly to provide a robust analysis of how the market would be impacted had actual projects not been constructed and placed into service. Similar to 2014, DTE Gas looks to experts in the industry to supplement its team when it needs these types of analyses done.

**Q88. Why is DTE Gas asking for this analysis now?**

A88. Based upon the information available and analysis completed at the time, the NEXUS agreement was appropriate to execute when the Company first entered into it. And while the Commission should focus on the decisions made based on the information that the Company knew or should have known at the time; it can be appropriate to consider ongoing effects of those decisions in some circumstances.

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The author of the article in Exhibit A-32 stated, "The reality, of course, is that it is one of the most high-tech industries on the face of the earth, led by engineers, geologists and other scientists who advance efficiencies and improve technologies each and every day." He was talking about the focus on the technology side of the knowledge base in the industry, but I think it can be expanded to be a reminder to us that the Company and the others in the marketplace are continuing to improve all aspects of the knowledge base and that even though approval is based on information available at the time of the decision, it is appropriate to refresh analysis from time to time to review how the marketplace has evolved.

**Q89. Did the refreshed results that FTI provided show benefits to DTE Gas customers?**

A89. Yes. The updated report showed that MichCon Citygate prices are down on average of $0.08 over the life of the contract due to the NEXUS pipeline being built. The analysis estimates that DTE Gas customers will save approximately $199 million between 2022 and 2038 and that all consumers in the state of Michigan will save roughly $1 billion due to the NEXUS pipeline being built.

**Q90. What is driving the savings for DTE Gas and the residents of Michigan?**

A90. FTI modeled the North American gas markets and evaluated a scenario wherein NEXUS was not built. By doing so, it was able to estimate the amount of savings DTE Gas customers and all consumers would receive by comparing the costs in a status quo environment as well as the "No NEXUS" case. These savings are discussed in more detail in Witness DeCourcey's testimony.

Line
No.

**Q91. Have you seen any other changes in the natural gas marketplace that show adding additional supply to Michigan would be beneficial to DTE Gas customers?**

A91. Yes, as I have discussed earlier in question 85, we have seen the MichCon City gate has shifted from a premium to a discount. In addition, more evidence occurred in February 2021, when the country experienced extreme cold temperatures, which led to freeze-offs as well as record setting pricing. Cash prices in Oklahoma hit $999, Northern, Demarc peaked around $230 and NIPSCO topped $200.

At the LDC Forum Southeast, Mr. Dave Schryver, President and CEO of the American Public Gas Association when discussing the February weather when the largest 2 days of demand across the country occurred stated, "95% of our members are captive to one pipeline, so they don't have a wide variety of suppliers to choose from. In addition, their access to storage is limited. So, this was a major issue for our members because they were forced to go out and buy gas at these high prices or pay even higher pipeline penalties." Mr. Schryver and earlier in the same conference Mr. Tim Echols, Vice-Chair, Georgia Public Service Commission commented on the importance of reliability to utilities and consumers.

The interconnectedness and reliability of the DTE Gas system was on full display during the February demand as the high price for MichCon city gate was under $8.00. This clearly shows another example of the benefits reliable and diverse supply by having multiple sources of natural gas from different regions of the country coming into the state.

Line
No.

**Q92. Recently the Commission has expressed that it would like the Companies (DTE Gas and DTE Electric) to attempt to renegotiate existing contracts when expected contract benefits do not materialize. Has DTE Gas tried to renegotiate the negotiated rate that DTE Gas pays on the NEXUS contract?**

A92. No. While there have been some delays that have affected liquidity and pricing at Kensington, overall, the NEXUS contract has achieved substantial benefits to DTE Gas customers. The Company has not concluded that it will not ultimately receive the expected benefits of the contract as originally anticipated in 2014. In addition, contracts between counterparties (even affiliates) are negotiated and executed at a point in time based on facts known by the parties at that point in time. There is always some inherent risk in any long-term contract that market or other changes may occur that may change expected outcomes. Because this risk is inherent in all long-term contracts, and all sophisticated parties accept this inherent risk, long-term contracts are not typically renegotiated when circumstances change unless there has been a breach of contract.

**Q93. Does the fact that the two entities are affiliates give DTE Gas leverage to renegotiate the contract?**

A93. No. First, the DTE affiliate only owns 50% of NEXUS, so even if it was possible, the DTE affiliate does not have a majority stake in NEXUS. More troubling is the idea that because of the affiliation between the companies, NEXUS should be expected to treat DTE Gas differently from its other customers. If NEXUS were to do so, it would constitute a violation of both the MPSC's Code of Conduct and FERC's Standards of Conduct – which state that affiliates are not allowed to offer to provide unduly discriminatory service (service discrimination of any kind). This

Line
No.

concept of providing another affiliate a benefit that is not available to all other companies in the marketplace is a clear example of what these prohibitions are trying to prevent.

**Q94. Has there been an appropriate time to renegotiate the NEXUS contract?**

A94. Yes, during the Precedent Agreement phase there were updates to the contract due to construction and regulatory delays. In addition, when DTE Gas wanted to modify the receipt point and acquired the ability to receive gas at Clarington versus Kensington. These negotiations were universal in that all shippers had the same ability to make these changes and NEXUS did not provide DTE Gas with any special treatment or benefit.

**TRANSPORTATION UTILIZATION**

**Q95. How much pipeline capacity does the Company have under contract?**

A95. The Company contracts for 330 MDth/d of summer pipeline capacity and 400 MDth/d of winter capacity.

**Q96. On a normal day during the winter months, what is the typical daily flow through pipelines?**

A96. Based on normal weather, the Company plans to utilize approximately 320 MDth/d of its pipeline capacity during the winter months. See Exhibit A-28, rows 46-54 for actual utilization percentages.

**Q97. Why does the Company contract for 400 MDth/d of firm transportation during the winter months?**

A97. The Company contracts for 400 MDth/d of firm transportation during the winter because this is the amount required on a design day to ensure reliable supply for GCR customers. The design day planning is described in more detail in Witness Bratu's testimony.

In addition, this pipeline capacity reaches back to a variety of supply points. During the winter, weather and pricing may be different at these various points, allowing the Company to optimize pipeline utilization based on variable costs.

**Q98. How does the Company determine what pipeline capacity to utilize when sourcing supply?**

A98. Once DTE Gas has acquired capacity, the Company can choose from various pipelines and basins to source gas. The decision for sourcing gas is based first on operational requirements and then on variable costs.

**Q99. Why is variable cost the appropriate analysis to use for sourcing gas i.e. determining pipeline utilization?**

A99. Variable cost is the appropriate analysis for sourcing gas, since the fixed reservation costs are sunk costs that the Company will pay whether gas flows or not. When the Company plans to buy gas, it stacks the potential sources based upon each source's variable cost (commodity costs plus variable transportation fees and any fuel usage required) from lowest to highest. The Company will review operational requirements and source gas though these pipelines first. Once the operationally required pipes are full, then the Company begins to fill remaining requirements from the bottom of the stack, starting with the source with the lowest variable costs.

Line No.

**Q100. Is there an expectation that the Company will use all 400 MDth/d of pipeline capacity throughout the winter?**

A100. No. If the weather does not approach design day requirements (which is based on requirements and storage levels), then we will not utilize all of our capacity. The warmer than normal winter experienced in 2020-2021 did not reach design day levels and therefore the company did not need to flow gas through all its pipeline capacity.

**Q101. Does the Company typically explore acquiring alternate supply paths other than its executed transportation contracts?**

A101. Yes, as part of the monthly purchase process, our Senior Buyer considers all alternate paths. This typically involves purchasing upstream pipeline capacity on one of our existing routes. If it appears that a new route might be an economic option, then we perform an analysis utilizing fixed and variable costs.

During the Plan year the Company acquired additional capacity for April 2020 for $0.095/Dth/d in order to purchase supply at Clarington versus Kensington.

**TRANSPORTATION COSTS**

**Q102. How did the actual transportation costs compare to the Plan as contained in Case No. U-20543?**

A102. The actual cost for transportation services was $60.3 million (Exhibit A-4, line 24, column c), or $31.5 million less than the $61.8 million projected in the original Plan case (as reproduced on Exhibit A-4, line 26, column c). Exhibit A-5 shows the actual transportation costs itemized by pipeline and by month, excluding Cashouts and Preliminary to Final Adjustments contained on Exhibit A-4, rows 21, 22, and 23.

Line No.

**Q103. Why was the actual transport cost $1.5 million less than planned?**

A103. Transportation cost was lower primarily due to DTE Gas paying receiving pipeline credits on Panhandle due to other shippers on Panhandle Eastern Pipeline Company's pipeline having to pay penalties related to violations of the operational flow orders issued related to Winter Storm Uri ($1.34 million). In addition, the Company received $0.6 million in capacity release credits offsetting reservation costs. These are slightly offset by $0.3 million call option premiums and $0.1 of other rounding adjustments.

**Q104. What is the call option discussed in the prior question?**

A104. The Company contracted for a call option to purchase up to 250,000 Dth/d for any 10 days in January or February. The premium for this option is $125,000/month which equates to $250,00 in this GCR period (Exhibit A-5, lines 26-27). If called upon, the costs for striking the option would be as follows:

| Daily Quantity | Contract Price |
|---|---|
| 0 MMBtu to 100,000 MMBtu | Daily Index Price + $0.80 per MMBtu |
| 100,001 MMBtu to 200,000 MMBtu | Daily Index Price + $1.20 per MMBtu |
| 200,001 MMBtu to 250,000 MMBtu | Daily Index Price + $2.00 per MMBtu |

This option was added in September 2020 and therefore was not part of the GCR Plan as filed. Witness Bratu will describe in more detail in his testimony the rationale for executing the call option.

**Q105. Did DTE Gas exercise the option during the 2020-21 GCR year?**

A105. No it did not, therefore the only costs incurred were the $250,000 premium.

## CASHOUTS

**Q106. Did DTE Gas forecast any cashout costs or refunds in the Plan?**

A106. No. Historically, DTE Gas has not forecasted any level of cashouts due to the unpredictable nature and relatively immaterial impact on total gas supply costs.

**Q107. Did DTE Gas incur any costs or refunds associated with its interstate-transport providers' cashout mechanisms, or any other cashout mechanism?**

A107. Yes. As shown on Exhibit A-6, line 17, column (h), DTE Gas received approximately $0.1 million of cashout credits over the Reconciliation Period, which offsets other costs. These credits are primarily attributable to Interstate Pipelines' and DTE Gas's Cashout Mechanisms contained in their tariffs, which provide for monetary settlements of incidental imbalances each month at interconnecting receipt points.

**<u>AFFILIATE TRANSACTIONS</u>**

**Q108. Did DTE Gas incur any gas costs resulting from affiliate transactions during the April 2020 through March 2021 GCR Reconciliation Period?**

A108. Yes. Exhibit A-7 shows all gas supplies purchased from affiliate companies. Lines 1 through 28 contain the amount of gas that was delivered and purchased from affiliates during the April 2020 through March 2021 GCR Reconciliation Period. DTE Gas purchased 1.0 MMDth of gas for an approximate cost of $2.1 million at an average price of $2.07/Dth from MGAT. DTE Gas purchased 5.4 MMDth of gas for an approximate cost of $12.6 million at an average price of $2.35/Dth from DTEET.

Line
No.

**Q109. What is the nature of the purchases from MGAT?**

A109. DTE Gas Gathering Company owns and operates a natural gas gathering system in the northern part of the Lower Peninsula of Michigan, more commonly known as the Antrim Expansion Project (AEP). MGAT delivers gas from the AEP into DTE Gas's transmission system at the interconnecting meter station located in Kalkaska County, Michigan. During the delivery period April 2020 through March 2021, the volume of gas measured at the outlet of the AEP was greater than the net inputs to the AEP. These gains across AEP were delivered to DTE Gas at the Kalkaska-DTE Gas meter and consequently resulted in a surplus on DTE Gas's system. DTE Gas has agreed to purchase these imbalance volumes from MGAT at the time the volumes are delivered through the meter.

**Q110. How have the MGAT imbalance volumes been priced?**

A110. MGAT imbalances were priced as required by prior Commission orders in Case Nos. U-15451-R and U-16146 at the DTE Gas city-gate monthly index rate.

**Q111. So, does that mean that the Company is paying market price for the gas it buys from MGAT?**

A111. Yes.

**Q112. What is the nature of the DTEET purchases?**

A112. DTEET is a credit worthy supplier that has executed an NAESB contract with DTE Gas. DTE Gas solicits supply from a number of natural gas suppliers when it is planning on executing purchases and DTEET is on the list when the Company

Line No.

solicits supply. The Company evaluates DTEET's offer exactly the same it would for any other credit worthy counterparty.

**Q113. So, does that mean that the Company is paying market price for the gas it buys from DTEET?**

A113. Yes.

**<u>CONCLUSIONS</u>**

**Q114. Were the decisions made for gas supply delivered over the 2020-21 GCR Reconciliation Period reasonable and prudent?**

A114. Yes. All gas supply decisions were reasonable and prudent, and the Commission should approve the Company's recovery of these costs from its customers.

**Q115. Does this conclude your direct testimony?**

A115. Yes, it does.

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021. | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

EXHIBITS

OF

ERIC P. SCHIFFER

DTE Gas Company
NYMEX and Published Market Index Prices
April 2020-March 2021

Case No: U-20544
Witness: E. P. Schiffer
Exhibit No: A-1


| Line | | NYMEX | ANR SW Field | | Emerson | | MichCon City-Gate | | Chicago City-Gate | | Panhandle Field | | ANR - ML3 | | Kensington Plant (NEXUS) | | Clarington (TEAL) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Month | LTD | Basis | Rate | Basis | Rate | Basis | Rate | Basis | Rate | Basis | Rate | Basis | Rate | Basis | Rate | Basis | Rate |
| | | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) | (col. k) | (col. l) | (col. m) | (col. n) | (col. o) | (col. p) | (col. q) |
| **GCR Plan ($/Dth)** | | | | | | | | | | | | | | | | | | |
| 1 | Apr-20 | 2.186 | (0.557) | 1.629 | (0.245) | 1.941 | (0.146) | 2.040 | (0.105) | 2.081 | (0.653) | 1.533 | (0.159) | 2.027 | (0.169) | 2.017 | (0.388) | 1.798 |
| 2 | May-20 | 2.194 | (0.502) | 1.692 | (0.369) | 1.825 | (0.171) | 2.023 | (0.204) | 1.990 | (0.603) | 1.591 | (0.251) | 1.943 | (0.232) | 1.962 | (0.469) | 1.725 |
| 3 | Jun-20 | 2.242 | (0.489) | 1.753 | (0.390) | 1.852 | (0.172) | 2.070 | (0.220) | 2.022 | (0.593) | 1.649 | (0.244) | 1.998 | (0.246) | 1.996 | (0.482) | 1.760 |
| 4 | Jul-20 | 2.295 | (0.447) | 1.848 | (0.416) | 1.879 | (0.215) | 2.080 | (0.230) | 2.065 | (0.503) | 1.792 | (0.272) | 2.023 | (0.202) | 2.093 | (0.438) | 1.857 |
| 5 | Aug-20 | 2.309 | (0.417) | 1.893 | (0.416) | 1.894 | (0.218) | 2.092 | (0.232) | 2.077 | (0.488) | 1.822 | (0.269) | 2.040 | (0.244) | 2.065 | (0.481) | 1.829 |
| 6 | Sep-20 | 2.296 | (0.497) | 1.800 | (0.440) | 1.856 | (0.256) | 2.041 | (0.282) | 2.014 | (0.543) | 1.753 | (0.324) | 1.972 | (0.492) | 1.805 | (0.722) | 1.575 |
| 7 | Oct-20 | 2.326 | (0.519) | 1.806 | (0.393) | 1.933 | (0.268) | 2.058 | (0.245) | 2.081 | (0.593) | 1.733 | (0.289) | 2.037 | (0.510) | 1.816 | (0.739) | 1.587 |
| 8 | Nov-20 | 2.404 | (0.401) | 2.003 | (0.022) | 2.382 | (0.150) | 2.254 | (0.147) | 2.257 | (0.425) | 1.979 | (0.199) | 2.205 | (0.211) | 2.193 | (0.526) | 1.878 |
| 9 | Dec-20 | 2.584 | (0.349) | 2.235 | 0.060 | 2.644 | (0.146) | 2.438 | 0.118 | 2.702 | (0.368) | 2.215 | (0.138) | 2.445 | (0.097) | 2.487 | (0.409) | 2.175 |
| 10 | Jan-21 | 2.710 | (0.262) | 2.448 | 0.060 | 2.770 | (0.216) | 2.494 | 0.246 | 2.956 | (0.344) | 2.366 | (0.070) | 2.640 | (0.071) | 2.639 | (0.377) | 2.332 |
| 11 | Feb-21 | 2.672 | (0.264) | 2.408 | 0.064 | 2.737 | (0.131) | 2.541 | 0.271 | 2.944 | (0.348) | 2.324 | (0.037) | 2.635 | (0.071) | 2.602 | (0.375) | 2.298 |
| 12 | Mar-21 | 2.556 | (0.309) | 2.246 | 0.061 | 2.617 | (0.101) | 2.455 | (0.045) | 2.511 | (0.378) | 2.177 | (0.168) | 2.387 | (0.078) | 2.478 | (0.385) | 2.171 |
| 13 | Avg | 2.398 | (0.418) | 1.980 | (0.204) | 2.194 | (0.182) | 2.215 | (0.090) | 2.308 | (0.487) | 1.911 | (0.202) | 2.196 | (0.218) | 2.179 | (0.482) | 1.915 |
| **Actual ($/Dth)** | | | | | | | | | | | | | | | | | | |
| 14 | Apr-20 | 1.634 | (0.444) | 1.190 | (0.194) | 1.440 | (0.154) | 1.480 | (0.174) | 1.460 | (0.564) | 1.070 | (0.224) | 1.410 | (0.244) | 1.390 | (0.464) | 1.170 |
| 15 | May-20 | 1.794 | (0.174) | 1.620 | (0.054) | 1.740 | (0.014) | 1.780 | 0.026 | 1.820 | (0.254) | 1.540 | (0.104) | 1.690 | (0.184) | 1.610 | (0.374) | 1.420 |
| 16 | Jun-20 | 1.722 | (0.212) | 1.510 | (0.122) | 1.600 | (0.122) | 1.600 | (0.122) | 1.600 | (0.402) | 1.320 | (0.162) | 1.560 | (0.292) | 1.430 | (0.482) | 1.240 |
| 17 | Jul-20 | 1.495 | (0.065) | 1.430 | 0.115 | 1.610 | (0.055) | 1.440 | 0.045 | 1.540 | (0.172) | 1.323 | (0.105) | 1.390 | (0.225) | 1.270 | (0.375) | 1.120 |
| 18 | Aug-20 | 1.854 | (0.154) | 1.700 | (0.139) | 1.715 | (0.154) | 1.700 | (0.104) | 1.750 | (0.244) | 1.610 | (0.144) | 1.710 | (0.274) | 1.580 | (0.674) | 1.180 |
| 19 | Sep-20 | 2.579 | (0.359) | 2.220 | (0.333) | 2.246 | (0.379) | 2.200 | (0.259) | 2.320 | (0.379) | 2.200 | (0.269) | 2.310 | (0.839) | 1.740 | (1.579) | 1.000 |
| 20 | Oct-20 | 2.101 | (0.211) | 1.890 | 0.246 | 2.347 | (0.281) | 1.820 | (0.111) | 1.990 | (0.321) | 1.780 | (0.281) | 1.820 | (0.531) | 1.570 | (1.451) | 0.650 |
| 21 | Nov-20 | 2.998 | (0.138) | 2.860 | 0.547 | 3.545 | (0.318) | 2.680 | (0.108) | 2.890 | (0.308) | 2.690 | (0.308) | 2.690 | (0.548) | 2.450 | (1.428) | 1.570 |
| 22 | Dec-20 | 2.895 | (0.365) | 2.530 | (0.295) | 2.600 | (0.285) | 2.610 | (0.325) | 2.570 | (0.325) | 2.570 | (0.315) | 2.580 | (0.495) | 2.400 | (1.295) | 1.600 |
| 23 | Jan-21 | 2.467 | 0.163 | 2.630 | (0.157) | 2.310 | (0.167) | 2.300 | (0.137) | 2.330 | (0.177) | 2.290 | (0.177) | 2.290 | (0.217) | 2.250 | (0.537) | 1.930 |
| 24 | Feb-21 | 2.760 | 0.180 | 2.940 | (0.110) | 2.650 | (0.170) | 2.590 | (0.160) | 2.600 | 0.060 | 2.820 | (0.100) | 2.660 | (0.200) | 2.560 | (0.370) | 2.390 |
| 25 | Mar-21 | 2.834 | 0.106 | 2.940 | (0.064) | 2.770 | (0.104) | 2.730 | 0.076 | 2.910 | (0.014) | 2.820 | (0.084) | 2.750 | (0.224) | 2.610 | (0.534) | 2.300 |
| 26 | Avg | 2.261 | (0.139) | 2.122 | (0.047) | 2.214 | (0.184) | 2.078 | (0.113) | 2.148 | (0.564) | 2.003 | (0.189) | 2.072 | (0.356) | 1.905 | (0.797) | 1.464 |
| **Variance ($/Dth)** | | | | | | | | | | | | | | | | | | |
| 27 | Apr-20 | (0.552) | 0.113 | (0.439) | 0.051 | (0.501) | (0.008) | (0.560) | (0.069) | (0.621) | 0.089 | (0.463) | (0.065) | (0.617) | (0.076) | (0.627) | (0.076) | (0.628) |
| 28 | May-20 | (0.400) | 0.328 | (0.072) | 0.315 | (0.085) | 0.157 | (0.243) | 0.230 | (0.170) | 0.349 | (0.051) | 0.147 | (0.253) | 0.048 | (0.352) | 0.095 | (0.305) |
| 29 | Jun-20 | (0.520) | 0.277 | (0.243) | 0.268 | (0.252) | 0.050 | (0.470) | 0.098 | (0.422) | 0.191 | (0.329) | 0.082 | (0.438) | (0.047) | (0.566) | (0.000) | (0.520) |
| 30 | Jul-20 | (0.800) | 0.382 | (0.418) | 0.531 | (0.269) | 0.160 | (0.640) | 0.275 | (0.525) | 0.331 | (0.469) | 0.167 | (0.633) | (0.023) | (0.823) | 0.063 | (0.737) |
| 31 | Aug-20 | (0.455) | 0.263 | (0.193) | 0.277 | (0.179) | 0.064 | (0.392) | 0.128 | (0.327) | 0.244 | (0.212) | 0.125 | (0.330) | (0.030) | (0.485) | (0.194) | (0.649) |
| 32 | Sep-20 | 0.283 | 0.138 | 0.421 | 0.107 | 0.390 | (0.123) | 0.159 | 0.023 | 0.306 | 0.164 | 0.447 | 0.055 | 0.338 | (0.348) | (0.065) | (0.857) | (0.575) |
| 33 | Oct-20 | (0.225) | 0.308 | 0.084 | 0.639 | 0.414 | (0.013) | (0.238) | 0.134 | (0.091) | 0.272 | 0.047 | 0.008 | (0.217) | (0.021) | (0.246) | (0.712) | (0.937) |
| 34 | Nov-20 | 0.594 | 0.263 | 0.857 | 0.569 | 1.163 | (0.168) | 0.426 | 0.039 | 0.633 | 0.117 | 0.711 | (0.109) | 0.485 | (0.337) | 0.257 | (0.902) | (0.308) |
| 35 | Dec-20 | 0.311 | (0.016) | 0.296 | (0.355) | (0.044) | (0.139) | 0.172 | (0.443) | (0.132) | 0.043 | 0.355 | (0.177) | 0.135 | (0.398) | (0.087) | (0.886) | (0.575) |
| 36 | Jan-21 | (0.243) | 0.425 | 0.182 | (0.217) | (0.460) | 0.049 | (0.194) | (0.383) | (0.626) | 0.167 | (0.076) | (0.107) | (0.350) | (0.146) | (0.389) | (0.160) | (0.402) |
| 37 | Feb-21 | 0.088 | 0.444 | 0.532 | (0.174) | (0.087) | (0.039) | 0.049 | (0.431) | (0.344) | 0.408 | 0.496 | (0.063) | 0.025 | (0.129) | (0.042) | 0.005 | 0.092 |
| 38 | Mar-21 | 0.278 | 0.415 | 0.694 | (0.125) | 0.153 | (0.003) | 0.275 | 0.121 | 0.399 | 0.364 | 0.643 | 0.084 | 0.363 | (0.146) | 0.133 | (0.149) | 0.129 |
| 39 | Avg | (0.137) | 0.278 | 0.142 | 0.157 | 0.020 | (0.001) | (0.138) | (0.023) | (0.160) | 0.228 | 0.092 | 0.012 | (0.124) | (0.138) | (0.274) | (0.314) | (0.451) |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 1 | 6763135 | 1/8/2018 | O | 4/1/2020 | 4/30/2020 | 12,900 | ANR S W Headstation | $2.21 | 387,000 | 853,335 |
| 2 | 6763135 | 1/8/2018 | O | 5/1/2020 | 5/31/2020 | 12,900 | ANR S W Headstation | $2.21 | 399,900 | 881,780 |
| 3 | 6763135 | 1/8/2018 | O | 6/1/2020 | 6/30/2020 | 12,900 | ANR S W Headstation | $2.21 | 387,000 | 853,335 |
| 4 | 6763135 | 1/8/2018 | O | 7/1/2020 | 7/31/2020 | 12,900 | ANR S W Headstation | $2.21 | 399,900 | 881,780 |
| 5 | 6763135 | 1/8/2018 | O | 8/1/2020 | 8/31/2020 | 12,900 | ANR S W Headstation | $2.21 | 399,900 | 881,780 |
| 6 | 6763135 | 1/8/2018 | O | 9/1/2020 | 9/30/2020 | 12,894 | ANR S W Headstation | $2.21 | 386,812 | 852,920 |
| 7 | 6763135 | 1/8/2018 | O | 10/1/2020 | 10/31/2020 | 12,900 | ANR S W Headstation | $2.21 | 399,900 | 881,780 |
| 8 | **6763135 Total** | | | | | | | | 2,760,412 | 6,086,708 |
| 9 | 6763281 | 1/8/2018 | C | 11/1/2020 | 11/30/2020 | 9,500 | ANR S W Headstation | $2.70 | 285,000 | 768,075 |
| 10 | 6763281 | 1/8/2018 | C | 12/1/2020 | 12/31/2020 | 9,500 | ANR S W Headstation | $2.70 | 294,500 | 793,678 |
| 11 | 6763281 | 1/8/2018 | C | 1/1/2021 | 1/31/2021 | 9,500 | ANR S W Headstation | $2.70 | 294,500 | 793,678 |
| 12 | 6763281 | 1/8/2018 | C | 2/1/2021 | 2/28/2021 | 9,500 | ANR S W Headstation | $2.70 | 266,000 | 716,870 |
| 13 | 6763281 | 1/8/2018 | C | 3/1/2021 | 3/31/2021 | 9,500 | ANR S W Headstation | $2.70 | 294,500 | 793,678 |
| 14 | **6763281 Total** | | | | | | | | 1,434,500 | 3,865,978 |
| 15 | 6822722 | 2/2/2018 | AW | 4/1/2020 | 4/30/2020 | 5,000 | PEPL Pool - Field | $1.99 | 150,000 | 297,750 |
| 16 | 6822722 | 2/2/2018 | AW | 5/1/2020 | 5/31/2020 | 5,000 | PEPL Pool - Field | $1.99 | 155,000 | 307,675 |
| 17 | 6822722 | 2/2/2018 | AW | 6/1/2020 | 6/30/2020 | 5,000 | PEPL Pool - Field | $1.99 | 150,000 | 297,750 |
| 18 | 6822722 | 2/2/2018 | AW | 7/1/2020 | 7/31/2020 | 5,000 | PEPL Pool - Field | $1.99 | 155,000 | 307,675 |
| 19 | 6822722 | 2/2/2018 | AW | 8/1/2020 | 8/31/2020 | 5,000 | PEPL Pool - Field | $1.99 | 155,000 | 307,675 |
| 20 | 6822722 | 2/2/2018 | AW | 9/1/2020 | 9/30/2020 | 5,000 | PEPL Pool - Field | $1.99 | 150,000 | 297,750 |
| 21 | 6822722 | 2/2/2018 | AW | 10/1/2020 | 10/31/2020 | 5,000 | PEPL Pool - Field | $1.99 | 155,000 | 307,675 |
| 22 | **6822722 Total** | | | | | | | | 1,070,000 | 2,123,950 |
| 23 | 6822728 | 2/2/2018 | C | 4/1/2020 | 4/30/2020 | 7,700 | PEPL Pool - Field | $2.00 | 231,000 | 460,845 |
| 24 | 6822728 | 2/2/2018 | C | 5/1/2020 | 5/31/2020 | 7,700 | PEPL Pool - Field | $2.00 | 238,700 | 476,207 |
| 25 | 6822728 | 2/2/2018 | C | 6/1/2020 | 6/30/2020 | 7,700 | PEPL Pool - Field | $2.00 | 231,000 | 460,845 |
| 26 | 6822728 | 2/2/2018 | C | 7/1/2020 | 7/31/2020 | 7,700 | PEPL Pool - Field | $2.00 | 238,700 | 476,207 |
| 27 | 6822728 | 2/2/2018 | C | 8/1/2020 | 8/31/2020 | 7,700 | PEPL Pool - Field | $2.00 | 238,700 | 476,207 |
| 28 | 6822728 | 2/2/2018 | C | 9/1/2020 | 9/30/2020 | 7,700 | PEPL Pool - Field | $2.00 | 231,000 | 460,845 |
| 29 | 6822728 | 2/2/2018 | C | 10/1/2020 | 10/31/2020 | 7,700 | PEPL Pool - Field | $2.00 | 238,700 | 476,207 |
| 30 | **6822728 Total** | | | | | | | | 1,647,800 | 3,287,361 |
| 31 | 6824613 | 2/5/2018 | F | 11/1/2020 | 11/30/2020 | 4,100 | PEPL Pool - Field | $2.60 | 123,000 | 319,800 |
| 32 | 6824613 | 2/5/2018 | F | 12/1/2020 | 12/31/2020 | 4,100 | PEPL Pool - Field | $2.60 | 127,100 | 330,460 |
| 33 | 6824613 | 2/5/2018 | F | 1/1/2021 | 1/31/2021 | 4,100 | PEPL Pool - Field | $2.60 | 127,100 | 330,460 |
| 34 | 6824613 | 2/5/2018 | F | 2/1/2021 | 2/28/2021 | 4,100 | PEPL Pool - Field | $2.60 | 114,800 | 298,480 |
| 35 | 6824613 | 2/5/2018 | F | 3/1/2021 | 3/31/2021 | 4,100 | PEPL Pool - Field | $2.60 | 127,100 | 330,460 |
| 36 | **6824613 Total** | | | | | | | | 619,100 | 1,609,660 |
| 37 | 6824618 | 2/5/2018 | O | 11/1/2020 | 11/30/2020 | 5,000 | PEPL Pool - Field | $2.62 | 150,000 | 392,250 |
| 38 | 6824618 | 2/5/2018 | O | 12/1/2020 | 12/31/2020 | 5,000 | PEPL Pool - Field | $2.62 | 155,000 | 405,325 |
| 39 | 6824618 | 2/5/2018 | O | 1/1/2021 | 1/31/2021 | 5,000 | PEPL Pool - Field | $2.62 | 155,000 | 405,325 |
| 40 | 6824618 | 2/5/2018 | O | 2/1/2021 | 2/28/2021 | 5,000 | PEPL Pool - Field | $2.62 | 140,000 | 366,100 |
| 41 | 6824618 | 2/5/2018 | O | 3/1/2021 | 3/31/2021 | 5,000 | PEPL Pool - Field | $2.62 | 155,000 | 405,325 |
| 42 | **6824618 Total** | | | | | | | | 755,000 | 1,974,325 |
| 43 | 6872685 | 3/6/2018 | F | 4/1/2020 | 4/30/2020 | 7,000 | PEPL Pool - Field | $2.01 | 210,000 | 422,100 |
| 44 | 6872685 | 3/6/2018 | F | 5/1/2020 | 5/31/2020 | 7,000 | PEPL Pool - Field | $2.01 | 217,000 | 436,170 |
| 45 | 6872685 | 3/6/2018 | F | 6/1/2020 | 6/30/2020 | 7,000 | PEPL Pool - Field | $2.01 | 210,000 | 422,100 |
| 46 | 6872685 | 3/6/2018 | F | 7/1/2020 | 7/31/2020 | 7,000 | PEPL Pool - Field | $2.01 | 217,000 | 436,170 |
| 47 | 6872685 | 3/6/2018 | F | 8/1/2020 | 8/31/2020 | 7,000 | PEPL Pool - Field | $2.01 | 217,000 | 436,170 |
| 48 | 6872685 | 3/6/2018 | F | 9/1/2020 | 9/30/2020 | 7,000 | PEPL Pool - Field | $2.01 | 210,000 | 422,100 |
| 49 | 6872685 | 3/6/2018 | F | 10/1/2020 | 10/31/2020 | 7,000 | PEPL Pool - Field | $2.01 | 217,000 | 436,170 |
| 50 | **6872685 Total** | | | | | | | | 1,498,000 | 3,010,980 |
| 51 | 6872690 | 3/6/2018 | I | 4/1/2020 | 4/30/2020 | 5,900 | PEPL Pool - Field | $1.99 | 177,000 | 352,230 |
| 52 | 6872690 | 3/6/2018 | I | 5/1/2020 | 5/31/2020 | 5,900 | PEPL Pool - Field | $1.99 | 182,900 | 363,971 |
| 53 | 6872690 | 3/6/2018 | I | 6/1/2020 | 6/30/2020 | 5,900 | PEPL Pool - Field | $1.99 | 177,000 | 352,230 |
| 54 | 6872690 | 3/6/2018 | I | 7/1/2020 | 7/31/2020 | 5,900 | PEPL Pool - Field | $1.99 | 182,900 | 363,971 |
| 55 | 6872690 | 3/6/2018 | I | 8/1/2020 | 8/31/2020 | 5,900 | PEPL Pool - Field | $1.99 | 182,900 | 363,971 |
| 56 | 6872690 | 3/6/2018 | I | 9/1/2020 | 9/30/2020 | 5,900 | PEPL Pool - Field | $1.99 | 177,000 | 352,230 |
| 57 | 6872690 | 3/6/2018 | I | 10/1/2020 | 10/31/2020 | 5,900 | PEPL Pool - Field | $1.99 | 182,900 | 363,971 |
| 58 | **6872690 Total** | | | | | | | | 1,262,600 | 2,512,574 |

DTE Gas Company
Fixed Price Purchases
April 2020-March 2021

Case No: U-20544
Witness: E.P. Schiffer
Exhibit No: A-2


2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 59 | 6872767 | 3/6/2018 | AW | 11/1/2020 | 11/30/2020 | 4,100 | PEPL Pool - Field | $2.53 | 123,000 | 311,498 |
| 60 | 6872767 | 3/6/2018 | AW | 12/1/2020 | 12/31/2020 | 4,100 | PEPL Pool - Field | $2.53 | 127,100 | 321,881 |
| 61 | 6872767 | 3/6/2018 | AW | 1/1/2021 | 1/31/2021 | 4,100 | PEPL Pool - Field | $2.53 | 127,100 | 321,881 |
| 62 | 6872767 | 3/6/2018 | AW | 2/1/2021 | 2/28/2021 | 4,100 | PEPL Pool - Field | $2.53 | 114,799 | 290,728 |
| 63 | 6872767 | 3/6/2018 | AW | 3/1/2021 | 3/31/2021 | 4,100 | PEPL Pool - Field | $2.53 | 127,100 | 321,881 |
| 64 | **6872767 Total** | | | | | | | | 619,099 | 1,567,868 |
| 65 | 6874492 | 3/6/2018 | M | 11/1/2020 | 11/30/2020 | 5,000 | PEPL Pool - Field | $2.56 | 150,000 | 384,000 |
| 66 | 6874492 | 3/6/2018 | M | 12/1/2020 | 12/31/2020 | 5,000 | PEPL Pool - Field | $2.56 | 155,000 | 396,800 |
| 67 | 6874492 | 3/6/2018 | M | 1/1/2021 | 1/31/2021 | 5,000 | PEPL Pool - Field | $2.56 | 155,000 | 396,800 |
| 68 | 6874492 | 3/6/2018 | M | 2/1/2021 | 2/28/2021 | 4,906 | PEPL Pool - Field | $2.56 | 137,369 | 351,665 |
| 69 | 6874492 | 3/6/2018 | M | 3/1/2021 | 3/31/2021 | 5,000 | PEPL Pool - Field | $2.56 | 155,000 | 396,800 |
| 70 | **6874492 Total** | | | | | | | | 752,369 | 1,926,065 |
| 71 | 6933935 | 4/12/2018 | AW | 4/1/2020 | 4/30/2020 | 12,900 | GRTLKE Emerson | $2.15 | 387,000 | 832,050 |
| 72 | 6933935 | 4/12/2018 | AW | 5/1/2020 | 5/31/2020 | 12,900 | GRTLKE Emerson | $2.15 | 399,900 | 859,785 |
| 73 | 6933935 | 4/12/2018 | AW | 6/1/2020 | 6/30/2020 | 12,900 | GRTLKE Emerson | $2.15 | 387,000 | 832,050 |
| 74 | 6933935 | 4/12/2018 | AW | 7/1/2020 | 7/31/2020 | 12,900 | GRTLKE Emerson | $2.15 | 399,900 | 859,785 |
| 75 | 6933935 | 4/12/2018 | AW | 8/1/2020 | 8/31/2020 | 12,663 | GRTLKE Emerson | $2.15 | 392,547 | 843,976 |
| 76 | 6933935 | 4/12/2018 | AW | 9/1/2020 | 9/30/2020 | 12,900 | GRTLKE Emerson | $2.15 | 387,000 | 832,050 |
| 77 | 6933935 | 4/12/2018 | AW | 10/1/2020 | 10/31/2020 | 12,900 | GRTLKE Emerson | $2.15 | 399,900 | 859,785 |
| 78 | **6933935 Total** | | | | | | | | 2,753,247 | 5,919,481 |
| 79 | 6934522 | 4/12/2018 | AQ | 11/1/2020 | 11/30/2020 | 9,100 | GRTLKE Emerson | $2.81 | 273,000 | 765,765 |
| 80 | 6934522 | 4/12/2018 | AQ | 12/1/2020 | 12/31/2020 | 9,100 | GRTLKE Emerson | $2.81 | 282,100 | 791,291 |
| 81 | 6934522 | 4/12/2018 | AQ | 1/1/2021 | 1/31/2021 | 9,100 | GRTLKE Emerson | $2.81 | 282,100 | 791,291 |
| 82 | 6934522 | 4/12/2018 | AQ | 2/1/2021 | 2/28/2021 | 9,100 | GRTLKE Emerson | $2.81 | 254,800 | 714,714 |
| 83 | 6934522 | 4/12/2018 | AQ | 3/1/2021 | 3/31/2021 | 9,100 | GRTLKE Emerson | $2.81 | 282,100 | 791,291 |
| 84 | **6934522 Total** | | | | | | | | 1,374,100 | 3,854,351 |
| 85 | 6973527 | 5/3/2018 | M | 4/1/2020 | 4/30/2020 | 10,000 | PEPL Pool - Field | $1.85 | 300,000 | 555,000 |
| 86 | 6973527 | 5/3/2018 | M | 5/1/2020 | 5/31/2020 | 10,000 | PEPL Pool - Field | $1.85 | 310,000 | 573,500 |
| 87 | 6973527 | 5/3/2018 | M | 6/1/2020 | 6/30/2020 | 10,000 | PEPL Pool - Field | $1.85 | 300,000 | 555,000 |
| 88 | 6973527 | 5/3/2018 | M | 7/1/2020 | 7/31/2020 | 10,000 | PEPL Pool - Field | $1.85 | 310,000 | 573,500 |
| 89 | 6973527 | 5/3/2018 | M | 8/1/2020 | 8/31/2020 | 10,000 | PEPL Pool - Field | $1.85 | 310,000 | 573,500 |
| 90 | 6973527 | 5/3/2018 | M | 9/1/2020 | 9/30/2020 | 10,000 | PEPL Pool - Field | $1.85 | 300,000 | 555,000 |
| 91 | 6973527 | 5/3/2018 | M | 10/1/2020 | 10/31/2020 | 10,000 | PEPL Pool - Field | $1.85 | 310,000 | 573,500 |
| 92 | **6973527 Total** | | | | | | | | 2,140,000 | 3,959,000 |
| 93 | 6977914 | 5/4/2018 | M | 4/1/2020 | 4/30/2020 | 2,800 | ANR S W Headstation | $1.89 | 84,000 | 158,340 |
| 94 | 6977914 | 5/4/2018 | M | 5/1/2020 | 5/31/2020 | 2,800 | ANR S W Headstation | $1.89 | 86,800 | 163,618 |
| 95 | 6977914 | 5/4/2018 | M | 6/1/2020 | 6/30/2020 | 2,800 | ANR S W Headstation | $1.89 | 84,000 | 158,340 |
| 96 | 6977914 | 5/4/2018 | M | 7/1/2020 | 7/31/2020 | 2,800 | ANR S W Headstation | $1.89 | 86,800 | 163,618 |
| 97 | 6977914 | 5/4/2018 | M | 8/1/2020 | 8/31/2020 | 2,800 | ANR S W Headstation | $1.89 | 86,800 | 163,618 |
| 98 | 6977914 | 5/4/2018 | M | 9/1/2020 | 9/30/2020 | 2,800 | ANR S W Headstation | $1.89 | 84,000 | 158,340 |
| 99 | 6977914 | 5/4/2018 | M | 10/1/2020 | 10/31/2020 | 2,800 | ANR S W Headstation | $1.89 | 86,800 | 163,618 |
| 100 | **6977914 Total** | | | | | | | | 599,200 | 1,129,492 |
| 101 | 6978102 | 5/4/2018 | F | 11/1/2020 | 11/30/2020 | 8,800 | VIKING Emerson | $2.66 | 264,000 | 700,920 |
| 102 | 6978102 | 5/4/2018 | F | 12/1/2020 | 12/31/2020 | 8,800 | VIKING Emerson | $2.66 | 272,800 | 724,284 |
| 103 | 6978102 | 5/4/2018 | F | 1/1/2021 | 1/31/2021 | 8,800 | VIKING Emerson | $2.66 | 272,800 | 724,284 |
| 104 | 6978102 | 5/4/2018 | F | 2/1/2021 | 2/28/2021 | 8,800 | VIKING Emerson | $2.66 | 246,400 | 654,192 |
| 105 | 6978102 | 5/4/2018 | F | 3/1/2021 | 3/31/2021 | 0 | VIKING Emerson | $0.00 | 0 | 19,432 |
| 106 | 6978102 | 5/4/2018 | F | 3/1/2021 | 3/31/2021 | 7,521 | VIKING Emerson | $2.66 | 233,137 | 618,979 |
| 107 | **6978102 Total** | | | | | | | | 1,289,137 | 3,442,090 |
| 108 | 7032205 | 6/5/2018 | AQ | 4/1/2020 | 4/30/2020 | 12,800 | VIKING Emerson | $2.00 | 384,000 | 768,000 |
| 109 | 7032205 | 6/5/2018 | AQ | 5/1/2020 | 5/31/2020 | 12,800 | VIKING Emerson | $2.00 | 396,800 | 793,600 |
| 110 | 7032205 | 6/5/2018 | AQ | 6/1/2020 | 6/30/2020 | 11,520 | VIKING Emerson | $2.00 | 345,600 | 691,200 |
| 111 | 7032205 | 6/5/2018 | AQ | 7/1/2020 | 7/31/2020 | 12,800 | VIKING Emerson | $2.00 | 396,800 | 793,600 |
| 112 | 7032205 | 6/5/2018 | AQ | 8/1/2020 | 8/31/2020 | 12,800 | VIKING Emerson | $2.00 | 396,800 | 793,600 |
| 113 | 7032205 | 6/5/2018 | AQ | 9/1/2020 | 9/30/2020 | 12,800 | VIKING Emerson | $2.00 | 384,000 | 768,000 |
| 114 | 7032205 | 6/5/2018 | AQ | 10/1/2020 | 10/31/2020 | 11,702 | VIKING Emerson | $2.00 | 362,764 | 725,528 |
| 115 | **7032205 Total** | | | | | | | | 2,666,764 | 5,333,528 |
| 116 | 7032215 | 6/5/2018 | F | 11/1/2020 | 11/30/2020 | 9,100 | ANR S W Headstation | $2.41 | 273,000 | 656,565 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 117 | 7032215 | 6/5/2018 | F | 12/1/2020 | 12/31/2020 | 9,100 | ANR S W Headstation | $2.41 | 282,100 | 678,451 |
| 118 | 7032215 | 6/5/2018 | F | 1/1/2021 | 1/31/2021 | 9,100 | ANR S W Headstation | $2.41 | 282,100 | 678,451 |
| 119 | 7032215 | 6/5/2018 | F | 2/1/2021 | 2/28/2021 | 8,557 | ANR S W Headstation | $2.41 | 239,598 | 576,233 |
| 120 | 7032215 | 6/5/2018 | F | 3/1/2021 | 3/31/2021 | 9,100 | ANR S W Headstation | $2.41 | 282,100 | 678,451 |
| 121 | **7032215 Total** | | | | | | | | 1,358,898 | 3,268,150 |
| 122 | 7090771 | 7/9/2018 | I | 4/1/2020 | 4/30/2020 | 4,600 | PEPL Pool - Field | $1.95 | 138,000 | 269,100 |
| 123 | 7090771 | 7/9/2018 | I | 5/1/2020 | 5/31/2020 | 4,600 | PEPL Pool - Field | $1.95 | 142,600 | 278,070 |
| 124 | 7090771 | 7/9/2018 | I | 6/1/2020 | 6/30/2020 | 4,600 | PEPL Pool - Field | $1.95 | 138,000 | 269,100 |
| 125 | 7090771 | 7/9/2018 | I | 7/1/2020 | 7/31/2020 | 4,600 | PEPL Pool - Field | $1.95 | 142,600 | 278,070 |
| 126 | 7090771 | 7/9/2018 | I | 8/1/2020 | 8/31/2020 | 4,600 | PEPL Pool - Field | $1.95 | 142,600 | 278,070 |
| 127 | 7090771 | 7/9/2018 | I | 9/1/2020 | 9/30/2020 | 4,600 | PEPL Pool - Field | $1.95 | 138,000 | 269,100 |
| 128 | 7090771 | 7/9/2018 | I | 10/1/2020 | 10/31/2020 | 4,600 | PEPL Pool - Field | $1.95 | 142,600 | 278,070 |
| 129 | **7090771 Total** | | | | | | | | 984,400 | 1,919,580 |
| 130 | 7090772 | 7/9/2018 | C | 4/1/2020 | 4/30/2020 | 8,200 | VIKING Emerson | $2.05 | 246,000 | 504,300 |
| 131 | 7090772 | 7/9/2018 | C | 5/1/2020 | 5/31/2020 | 8,200 | VIKING Emerson | $2.05 | 254,200 | 521,110 |
| 132 | 7090772 | 7/9/2018 | C | 6/1/2020 | 6/30/2020 | 7,380 | VIKING Emerson | $2.05 | 221,400 | 453,870 |
| 133 | 7090772 | 7/9/2018 | C | 7/1/2020 | 7/31/2020 | 8,200 | VIKING Emerson | $2.05 | 254,200 | 521,110 |
| 134 | 7090772 | 7/9/2018 | C | 8/1/2020 | 8/31/2020 | 8,200 | VIKING Emerson | $2.05 | 254,200 | 521,110 |
| 135 | 7090772 | 7/9/2018 | C | 9/1/2020 | 9/30/2020 | 8,200 | VIKING Emerson | $2.05 | 246,000 | 504,300 |
| 136 | 7090772 | 7/9/2018 | C | 10/1/2020 | 10/31/2020 | 6,725 | VIKING Emerson | $2.05 | 208,471 | 427,366 |
| 137 | **7090772 Total** | | | | | | | | 1,684,471 | 3,453,166 |
| 138 | 7093249 | 7/10/2018 | I | 11/1/2020 | 11/30/2020 | 10,300 | GRTLKE Emerson | $2.62 | 308,999 | 808,032 |
| 139 | 7093249 | 7/10/2018 | I | 12/1/2020 | 12/31/2020 | 10,300 | GRTLKE Emerson | $2.62 | 319,300 | 834,970 |
| 140 | 7093249 | 7/10/2018 | I | 1/1/2021 | 1/31/2021 | 10,300 | GRTLKE Emerson | $2.62 | 319,300 | 834,970 |
| 141 | 7093249 | 7/10/2018 | I | 2/1/2021 | 2/28/2021 | 10,300 | GRTLKE Emerson | $2.62 | 288,400 | 754,166 |
| 142 | 7093249 | 7/10/2018 | I | 3/1/2021 | 3/31/2021 | 10,300 | GRTLKE Emerson | $2.62 | 319,300 | 834,970 |
| 143 | **7093249 Total** | | | | | | | | 1,555,299 | 4,067,107 |
| 144 | 7137188 | 8/6/2018 | C | 4/1/2020 | 4/30/2020 | 12,800 | PEPL Pool - Field | $1.97 | 384,000 | 756,480 |
| 145 | 7137188 | 8/6/2018 | C | 5/1/2020 | 5/31/2020 | 12,800 | PEPL Pool - Field | $1.97 | 396,800 | 781,696 |
| 146 | 7137188 | 8/6/2018 | C | 6/1/2020 | 6/30/2020 | 12,800 | PEPL Pool - Field | $1.97 | 384,000 | 756,480 |
| 147 | 7137188 | 8/6/2018 | C | 7/1/2020 | 7/31/2020 | 12,800 | PEPL Pool - Field | $1.97 | 396,800 | 781,696 |
| 148 | 7137188 | 8/6/2018 | C | 8/1/2020 | 8/31/2020 | 12,800 | PEPL Pool - Field | $1.97 | 396,800 | 781,696 |
| 149 | 7137188 | 8/6/2018 | C | 9/1/2020 | 9/30/2020 | 12,800 | PEPL Pool - Field | $1.97 | 384,000 | 756,480 |
| 150 | 7137188 | 8/6/2018 | C | 10/1/2020 | 10/31/2020 | 12,800 | PEPL Pool - Field | $1.97 | 396,800 | 781,696 |
| 151 | **7137188 Total** | | | | | | | | 2,739,200 | 5,396,224 |
| 152 | 7147064 | 8/13/2018 | Y | 11/1/2020 | 11/30/2020 | 10,200 | VIKING Emerson | $2.59 | 306,000 | 792,540 |
| 153 | 7147064 | 8/13/2018 | Y | 12/1/2020 | 12/31/2020 | 10,200 | VIKING Emerson | $2.59 | 316,200 | 818,958 |
| 154 | 7147064 | 8/13/2018 | Y | 1/1/2021 | 1/31/2021 | 10,200 | VIKING Emerson | $2.59 | 316,200 | 818,958 |
| 155 | 7147064 | 8/13/2018 | Y | 2/1/2021 | 2/28/2021 | 10,200 | VIKING Emerson | $2.59 | 285,600 | 739,704 |
| 156 | 7147064 | 8/13/2018 | Y | 3/1/2021 | 3/31/2021 | 0 | VIKING Emerson | $0.00 | 0 | 20,808 |
| 157 | 7147064 | 8/13/2018 | Y | 3/1/2021 | 3/31/2021 | 8,717 | VIKING Emerson | $2.59 | 270,229 | 699,893 |
| 158 | **7147064 Total** | | | | | | | | 1,494,229 | 3,890,861 |
| 159 | 7191751 | 9/7/2018 | Q | 4/1/2020 | 4/30/2020 | 6,800 | PEPL Pool - Field | $1.99 | 204,000 | 406,470 |
| 160 | 7191751 | 9/7/2018 | Q | 5/1/2020 | 5/31/2020 | 6,800 | PEPL Pool - Field | $1.99 | 210,800 | 420,019 |
| 161 | 7191751 | 9/7/2018 | Q | 6/1/2020 | 6/30/2020 | 6,800 | PEPL Pool - Field | $1.99 | 204,000 | 406,470 |
| 162 | 7191751 | 9/7/2018 | Q | 7/1/2020 | 7/31/2020 | 6,800 | PEPL Pool - Field | $1.99 | 210,800 | 420,019 |
| 163 | 7191751 | 9/7/2018 | Q | 8/1/2020 | 8/31/2020 | 6,800 | PEPL Pool - Field | $1.99 | 210,800 | 420,019 |
| 164 | 7191751 | 9/7/2018 | Q | 9/1/2020 | 9/30/2020 | 6,800 | PEPL Pool - Field | $1.99 | 204,000 | 406,470 |
| 165 | 7191751 | 9/7/2018 | Q | 10/1/2020 | 10/31/2020 | 6,800 | PEPL Pool - Field | $1.99 | 210,800 | 420,019 |
| 166 | **7191751 Total** | | | | | | | | 1,455,200 | 2,899,486 |
| 167 | 7191756 | 9/7/2018 | I | 4/1/2020 | 4/30/2020 | 6,000 | PEPL Pool - Field | $2.01 | 180,000 | 360,900 |
| 168 | 7191756 | 9/7/2018 | I | 5/1/2020 | 5/31/2020 | 6,000 | PEPL Pool - Field | $2.01 | 186,000 | 372,930 |
| 169 | 7191756 | 9/7/2018 | I | 6/1/2020 | 6/30/2020 | 6,000 | PEPL Pool - Field | $2.01 | 180,000 | 360,900 |
| 170 | 7191756 | 9/7/2018 | I | 7/1/2020 | 7/31/2020 | 6,000 | PEPL Pool - Field | $2.01 | 186,000 | 372,930 |
| 171 | 7191756 | 9/7/2018 | I | 8/1/2020 | 8/31/2020 | 6,000 | PEPL Pool - Field | $2.01 | 186,000 | 372,930 |
| 172 | 7191756 | 9/7/2018 | I | 9/1/2020 | 9/30/2020 | 6,000 | PEPL Pool - Field | $2.01 | 180,000 | 360,900 |
| 173 | 7191756 | 9/7/2018 | I | 10/1/2020 | 10/31/2020 | 6,000 | PEPL Pool - Field | $2.01 | 186,000 | 372,930 |
| 174 | **7191756 Total** | | | | | | | | 1,284,000 | 2,574,420 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 175 | 7200559 | 9/13/2018 | C | 11/1/2020 | 11/30/2020 | 2,000 | PEPL Pool - Field | $2.28 | 60,000 | 136,500 |
| 176 | 7200559 | 9/13/2018 | C | 12/1/2020 | 12/31/2020 | 2,000 | PEPL Pool - Field | $2.28 | 62,000 | 141,050 |
| 177 | 7200559 | 9/13/2018 | C | 1/1/2021 | 1/31/2021 | 2,000 | PEPL Pool - Field | $2.28 | 62,000 | 141,050 |
| 178 | 7200559 | 9/13/2018 | C | 2/1/2021 | 2/28/2021 | 2,000 | PEPL Pool - Field | $2.28 | 56,000 | 127,400 |
| 179 | 7200559 | 9/13/2018 | C | 3/1/2021 | 3/31/2021 | 2,000 | PEPL Pool - Field | $2.28 | 62,000 | 141,050 |
| 180 | **7200559 Total** | | | | | | | | 302,000 | 687,050 |
| 181 | 7201081 | 9/13/2018 | AQ | 11/1/2020 | 11/30/2020 | 8,300 | GRTLKE Emerson | $2.71 | 249,000 | 674,790 |
| 182 | 7201081 | 9/13/2018 | AQ | 12/1/2020 | 12/31/2020 | 8,300 | GRTLKE Emerson | $2.71 | 257,300 | 697,283 |
| 183 | 7201081 | 9/13/2018 | AQ | 1/1/2021 | 1/31/2021 | 8,300 | GRTLKE Emerson | $2.71 | 257,300 | 697,283 |
| 184 | 7201081 | 9/13/2018 | AQ | 2/1/2021 | 2/28/2021 | 8,300 | GRTLKE Emerson | $2.71 | 232,400 | 629,804 |
| 185 | 7201081 | 9/13/2018 | AQ | 3/1/2021 | 3/31/2021 | 8,300 | GRTLKE Emerson | $2.71 | 257,300 | 697,283 |
| 186 | **7201081 Total** | | | | | | | | 1,253,300 | 3,396,443 |
| 187 | 7240473 | 10/4/2018 | Y | 4/1/2020 | 4/30/2020 | 6,000 | ANR S W Headstation | $2.05 | 180,000 | 369,000 |
| 188 | 7240473 | 10/4/2018 | Y | 5/1/2020 | 5/31/2020 | 6,000 | ANR S W Headstation | $2.05 | 186,000 | 381,300 |
| 189 | 7240473 | 10/4/2018 | Y | 6/1/2020 | 6/30/2020 | 6,000 | ANR S W Headstation | $2.05 | 180,000 | 369,000 |
| 190 | 7240473 | 10/4/2018 | Y | 7/1/2020 | 7/31/2020 | 6,000 | ANR S W Headstation | $2.05 | 186,000 | 381,300 |
| 191 | 7240473 | 10/4/2018 | Y | 8/1/2020 | 8/31/2020 | 6,000 | ANR S W Headstation | $2.05 | 186,000 | 381,300 |
| 192 | 7240473 | 10/4/2018 | Y | 9/1/2020 | 9/30/2020 | 6,000 | ANR S W Headstation | $2.05 | 180,000 | 369,000 |
| 193 | 7240473 | 10/4/2018 | Y | 10/1/2020 | 10/31/2020 | 6,000 | ANR S W Headstation | $2.05 | 186,000 | 381,300 |
| 194 | **7240473 Total** | | | | | | | | 1,284,000 | 2,632,200 |
| 195 | 7240476 | 10/4/2018 | O | 4/1/2020 | 4/30/2020 | 6,700 | ANR S W Headstation | $2.05 | 201,000 | 411,045 |
| 196 | 7240476 | 10/4/2018 | O | 5/1/2020 | 5/31/2020 | 6,700 | ANR S W Headstation | $2.05 | 207,700 | 424,747 |
| 197 | 7240476 | 10/4/2018 | O | 6/1/2020 | 6/30/2020 | 6,700 | ANR S W Headstation | $2.05 | 201,000 | 411,045 |
| 198 | 7240476 | 10/4/2018 | O | 7/1/2020 | 7/31/2020 | 6,700 | ANR S W Headstation | $2.05 | 207,700 | 424,747 |
| 199 | 7240476 | 10/4/2018 | O | 8/1/2020 | 8/31/2020 | 6,700 | ANR S W Headstation | $2.05 | 207,700 | 424,747 |
| 200 | 7240476 | 10/4/2018 | O | 9/1/2020 | 9/30/2020 | 6,697 | ANR S W Headstation | $2.05 | 200,901 | 410,843 |
| 201 | 7240476 | 10/4/2018 | O | 10/1/2020 | 10/31/2020 | 6,700 | ANR S W Headstation | $2.05 | 207,700 | 424,747 |
| 202 | **7240476 Total** | | | | | | | | 1,433,701 | 2,931,919 |
| 203 | 7251716 | 10/10/2018 | M | 11/1/2020 | 11/30/2020 | 10,600 | ANR S W Headstation | $2.43 | 318,000 | 771,150 |
| 204 | 7251716 | 10/10/2018 | M | 12/1/2020 | 12/31/2020 | 10,600 | ANR S W Headstation | $2.43 | 328,600 | 796,855 |
| 205 | 7251716 | 10/10/2018 | M | 1/1/2021 | 1/31/2021 | 10,600 | ANR S W Headstation | $2.43 | 328,600 | 796,855 |
| 206 | 7251716 | 10/10/2018 | M | 2/1/2021 | 2/28/2021 | 10,501 | ANR S W Headstation | $2.43 | 294,040 | 713,047 |
| 207 | 7251716 | 10/10/2018 | M | 3/1/2021 | 3/31/2021 | 10,600 | ANR S W Headstation | $2.43 | 328,600 | 796,855 |
| 208 | **7251716 Total** | | | | | | | | 1,597,840 | 3,874,762 |
| 209 | 7306815 | 11/6/2018 | C | 11/1/2020 | 11/30/2020 | 5,700 | ANR S W Headstation | $2.45 | 171,000 | 418,950 |
| 210 | 7306815 | 11/6/2018 | C | 12/1/2020 | 12/31/2020 | 5,700 | ANR S W Headstation | $2.45 | 176,700 | 432,915 |
| 211 | 7306815 | 11/6/2018 | C | 1/1/2021 | 1/31/2021 | 5,700 | ANR S W Headstation | $2.45 | 176,700 | 432,915 |
| 212 | 7306815 | 11/6/2018 | C | 2/1/2021 | 2/28/2021 | 5,700 | ANR S W Headstation | $2.45 | 159,600 | 391,020 |
| 213 | 7306815 | 11/6/2018 | C | 3/1/2021 | 3/31/2021 | 5,700 | ANR S W Headstation | $2.45 | 176,700 | 432,915 |
| 214 | **7306815 Total** | | | | | | | | 860,700 | 2,108,715 |
| 215 | 7306819 | 11/6/2018 | F | 11/1/2020 | 11/30/2020 | 5,000 | ANR S W Headstation | $2.46 | 150,000 | 368,250 |
| 216 | 7306819 | 11/6/2018 | F | 12/1/2020 | 12/31/2020 | 5,000 | ANR S W Headstation | $2.46 | 155,000 | 380,525 |
| 217 | 7306819 | 11/6/2018 | F | 1/1/2021 | 1/31/2021 | 5,000 | ANR S W Headstation | $2.46 | 155,000 | 380,525 |
| 218 | 7306819 | 11/6/2018 | F | 2/1/2021 | 2/28/2021 | 4,702 | ANR S W Headstation | $2.46 | 131,648 | 323,196 |
| 219 | 7306819 | 11/6/2018 | F | 3/1/2021 | 3/31/2021 | 5,000 | ANR S W Headstation | $2.46 | 155,000 | 380,525 |
| 220 | **7306819 Total** | | | | | | | | 746,648 | 1,833,021 |
| 221 | 7358446 | 12/4/2018 | C | 4/1/2020 | 4/30/2020 | 12,700 | NEXUS Nexus I/C with TET | $2.00 | 381,000 | 760,095 |
| 222 | 7358446 | 12/4/2018 | C | 5/1/2020 | 5/31/2020 | 12,700 | NEXUS Nexus I/C with TET | $2.00 | 393,700 | 785,432 |
| 223 | 7358446 | 12/4/2018 | C | 6/1/2020 | 6/30/2020 | 12,700 | NEXUS Nexus I/C with TET | $2.00 | 381,000 | 760,095 |
| 224 | 7358446 | 12/4/2018 | C | 7/1/2020 | 7/31/2020 | 12,266 | NEXUS Nexus I/C with TET | $2.00 | 380,236 | 758,571 |
| 225 | 7358446 | 12/4/2018 | C | 8/1/2020 | 8/31/2020 | 12,700 | NEXUS Nexus I/C with TET | $2.00 | 393,700 | 785,432 |
| 226 | 7358446 | 12/4/2018 | C | 9/1/2020 | 9/30/2020 | 12,535 | NEXUS Nexus I/C with TET | $2.00 | 376,036 | 750,192 |
| 227 | 7358446 | 12/4/2018 | C | 10/1/2020 | 10/31/2020 | 12,700 | NEXUS Nexus I/C with TET | $2.00 | 393,700 | 785,432 |
| 228 | **7358446 Total** | | | | | | | | 2,699,372 | 5,385,247 |
| 229 | 7361582 | 12/6/2018 | F | 11/1/2020 | 11/30/2020 | 10,600 | ANR S W Headstation | $2.50 | 318,000 | 793,410 |
| 230 | 7361582 | 12/6/2018 | F | 12/1/2020 | 12/31/2020 | 10,600 | ANR S W Headstation | $2.50 | 328,600 | 819,857 |
| 231 | 7361582 | 12/6/2018 | F | 1/1/2021 | 1/31/2021 | 10,600 | ANR S W Headstation | $2.50 | 328,600 | 819,857 |
| 232 | 7361582 | 12/6/2018 | F | 2/1/2021 | 2/28/2021 | 9,968 | ANR S W Headstation | $2.50 | 279,090 | 696,330 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 233 | 7361582 | 12/6/2018 | F | 3/1/2021 | 3/31/2021 | 10,600 | ANR S W Headstation | $2.50 | 328,600 | 819,857 |
| 234 | **7361582 Total** | | | | | | | | 1,582,890 | 3,949,311 |
| 235 | 7406537 | 1/4/2019 | AX | 4/1/2020 | 4/30/2020 | 12,600 | NEXUS Nexus I/C with TET | $2.05 | 378,000 | 774,900 |
| 236 | 7406537 | 1/4/2019 | AX | 5/1/2020 | 5/31/2020 | 12,600 | NEXUS Nexus I/C with TET | $2.05 | 390,600 | 800,730 |
| 237 | 7406537 | 1/4/2019 | AX | 6/1/2020 | 6/30/2020 | 12,600 | NEXUS Nexus I/C with TET | $2.05 | 378,000 | 774,900 |
| 238 | 7406537 | 1/4/2019 | AX | 7/1/2020 | 7/31/2020 | 12,169 | NEXUS Nexus I/C with TET | $2.05 | 377,243 | 773,348 |
| 239 | 7406537 | 1/4/2019 | AX | 8/1/2020 | 8/31/2020 | 12,600 | NEXUS Nexus I/C with TET | $2.05 | 390,600 | 800,730 |
| 240 | 7406537 | 1/4/2019 | AX | 9/1/2020 | 9/30/2020 | 0 | NEXUS Nexus I/C with TET | $0.00 | 0 | 4,259 |
| 241 | 7406537 | 1/4/2019 | AX | 9/1/2020 | 9/30/2020 | 12,434 | NEXUS Nexus I/C with TET | $2.05 | 373,005 | 764,660 |
| 242 | 7406537 | 1/4/2019 | AX | 10/1/2020 | 10/31/2020 | 12,600 | NEXUS Nexus I/C with TET | $2.05 | 390,600 | 800,730 |
| 243 | **7406537 Total** | | | | | | | | 2,678,048 | 5,494,257 |
| 244 | 7417452 | 1/11/2019 | M | 11/1/2020 | 11/30/2020 | 10,600 | PEPL Pool - Field | $2.50 | 318,000 | 795,000 |
| 245 | 7417452 | 1/11/2019 | M | 12/1/2020 | 12/31/2020 | 10,600 | PEPL Pool - Field | $2.50 | 328,600 | 821,500 |
| 246 | 7417452 | 1/11/2019 | M | 1/1/2021 | 1/31/2021 | 10,600 | PEPL Pool - Field | $2.50 | 328,600 | 821,500 |
| 247 | 7417452 | 1/11/2019 | M | 2/1/2021 | 2/28/2021 | 10,401 | PEPL Pool - Field | $2.50 | 291,221 | 728,053 |
| 248 | 7417452 | 1/11/2019 | M | 3/1/2021 | 3/31/2021 | 10,600 | PEPL Pool - Field | $2.50 | 328,600 | 821,500 |
| 249 | **7417452 Total** | | | | | | | | 1,595,021 | 3,987,553 |
| 250 | 7463583 | 2/4/2019 | AQ | 4/1/2020 | 4/30/2020 | 6,300 | GRTLKE Emerson | $2.16 | 189,000 | 408,240 |
| 251 | 7463583 | 2/4/2019 | AQ | 5/1/2020 | 5/31/2020 | 6,300 | GRTLKE Emerson | $2.16 | 195,300 | 421,848 |
| 252 | 7463583 | 2/4/2019 | AQ | 6/1/2020 | 6/30/2020 | 6,300 | GRTLKE Emerson | $2.16 | 189,000 | 408,240 |
| 253 | 7463583 | 2/4/2019 | AQ | 7/1/2020 | 7/31/2020 | 6,300 | GRTLKE Emerson | $2.16 | 195,300 | 421,848 |
| 254 | 7463583 | 2/4/2019 | AQ | 8/1/2020 | 8/31/2020 | 6,198 | GRTLKE Emerson | $2.16 | 192,125 | 414,990 |
| 255 | 7463583 | 2/4/2019 | AQ | 9/1/2020 | 9/30/2020 | 6,300 | GRTLKE Emerson | $2.16 | 189,000 | 408,240 |
| 256 | 7463583 | 2/4/2019 | AQ | 10/1/2020 | 10/31/2020 | 6,300 | GRTLKE Emerson | $2.16 | 195,300 | 421,848 |
| 257 | **7463583 Total** | | | | | | | | 1,345,025 | 2,905,254 |
| 258 | 7463672 | 2/4/2019 | C | 4/1/2020 | 4/30/2020 | 6,300 | GRTLKE Emerson | $2.16 | 189,000 | 408,240 |
| 259 | 7463672 | 2/4/2019 | C | 5/1/2020 | 5/31/2020 | 6,300 | GRTLKE Emerson | $2.16 | 195,300 | 421,848 |
| 260 | 7463672 | 2/4/2019 | C | 6/1/2020 | 6/30/2020 | 6,300 | GRTLKE Emerson | $2.16 | 189,000 | 408,240 |
| 261 | 7463672 | 2/4/2019 | C | 7/1/2020 | 7/31/2020 | 6,300 | GRTLKE Emerson | $2.16 | 195,300 | 421,848 |
| 262 | 7463672 | 2/4/2019 | C | 8/1/2020 | 8/31/2020 | 6,300 | GRTLKE Emerson | $2.16 | 195,300 | 421,848 |
| 263 | 7463672 | 2/4/2019 | C | 9/1/2020 | 9/30/2020 | 6,300 | GRTLKE Emerson | $2.16 | 189,000 | 408,240 |
| 264 | 7463672 | 2/4/2019 | C | 10/1/2020 | 10/31/2020 | 6,300 | GRTLKE Emerson | $2.16 | 195,300 | 421,848 |
| 265 | **7463672 Total** | | | | | | | | 1,348,200 | 2,912,112 |
| 266 | 7466208 | 2/5/2019 | AX | 11/1/2020 | 11/30/2020 | 10,500 | NEXUS Nexus I/C with TET | $2.45 | 315,000 | 771,750 |
| 267 | 7466208 | 2/5/2019 | AX | 12/1/2020 | 12/31/2020 | 10,500 | NEXUS Nexus I/C with TET | $2.45 | 325,500 | 797,475 |
| 268 | 7466208 | 2/5/2019 | AX | 1/1/2021 | 1/31/2021 | 10,500 | NEXUS Nexus I/C with TET | $2.45 | 325,500 | 797,475 |
| 269 | 7466208 | 2/5/2019 | AX | 2/1/2021 | 2/28/2021 | 10,500 | NEXUS Nexus I/C with TET | $2.45 | 294,000 | 720,300 |
| 270 | 7466208 | 2/5/2019 | AX | 3/1/2021 | 3/31/2021 | 10,500 | NEXUS Nexus I/C with TET | $2.45 | 325,500 | 797,475 |
| 271 | **7466208 Total** | | | | | | | | 1,585,500 | 3,884,475 |
| 272 | 7513758 | 3/4/2019 | F | 4/1/2020 | 4/30/2020 | 6,000 | ANR S W Headstation | $2.22 | 180,000 | 399,600 |
| 273 | 7513758 | 3/4/2019 | F | 5/1/2020 | 5/31/2020 | 5,999 | ANR S W Headstation | $2.22 | 185,968 | 412,849 |
| 274 | 7513758 | 3/4/2019 | F | 6/1/2020 | 6/30/2020 | 6,000 | ANR S W Headstation | $2.22 | 180,000 | 399,600 |
| 275 | 7513758 | 3/4/2019 | F | 7/1/2020 | 7/31/2020 | 6,000 | ANR S W Headstation | $2.22 | 186,000 | 412,920 |
| 276 | 7513758 | 3/4/2019 | F | 8/1/2020 | 8/31/2020 | 6,000 | ANR S W Headstation | $2.22 | 186,000 | 412,920 |
| 277 | 7513758 | 3/4/2019 | F | 9/1/2020 | 9/30/2020 | 6,000 | ANR S W Headstation | $2.22 | 180,000 | 399,600 |
| 278 | 7513758 | 3/4/2019 | F | 10/1/2020 | 10/31/2020 | 6,000 | ANR S W Headstation | $2.22 | 186,000 | 412,920 |
| 279 | **7513758 Total** | | | | | | | | 1,283,968 | 2,850,409 |
| 280 | 7515773 | 3/5/2019 | M | 4/1/2020 | 4/30/2020 | 6,400 | ANR S W Headstation | $2.21 | 192,000 | 424,320 |
| 281 | 7515773 | 3/5/2019 | M | 5/1/2020 | 5/31/2020 | 6,400 | ANR S W Headstation | $2.21 | 198,400 | 438,464 |
| 282 | 7515773 | 3/5/2019 | M | 6/1/2020 | 6/30/2020 | 6,400 | ANR S W Headstation | $2.21 | 192,000 | 424,320 |
| 283 | 7515773 | 3/5/2019 | M | 7/1/2020 | 7/31/2020 | 6,400 | ANR S W Headstation | $2.21 | 198,400 | 438,464 |
| 284 | 7515773 | 3/5/2019 | M | 8/1/2020 | 8/31/2020 | 6,400 | ANR S W Headstation | $2.21 | 198,400 | 438,464 |
| 285 | 7515773 | 3/5/2019 | M | 9/1/2020 | 9/30/2020 | 6,400 | ANR S W Headstation | $2.21 | 192,000 | 424,320 |
| 286 | 7515773 | 3/5/2019 | M | 10/1/2020 | 10/31/2020 | 6,400 | ANR S W Headstation | $2.21 | 198,400 | 438,464 |
| 287 | **7515773 Total** | | | | | | | | 1,369,600 | 3,026,816 |
| 288 | 7517361 | 3/5/2019 | C | 11/1/2020 | 11/30/2020 | 10,500 | NEXUS Nexus I/C with TET | $2.58 | 315,000 | 812,700 |
| 289 | 7517361 | 3/5/2019 | C | 12/1/2020 | 12/31/2020 | 10,500 | NEXUS Nexus I/C with TET | $2.58 | 325,500 | 839,790 |
| 290 | 7517361 | 3/5/2019 | C | 1/1/2021 | 1/31/2021 | 10,500 | NEXUS Nexus I/C with TET | $2.58 | 325,500 | 839,790 |

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| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 291 | 7517361 | 3/5/2019 | C | 2/1/2021 | 2/28/2021 | 10,500 | NEXUS Nexus I/C with TET | $2.58 | 294,000 | 758,520 |
| 292 | 7517361 | 3/5/2019 | C | 3/1/2021 | 3/31/2021 | 10,500 | NEXUS Nexus I/C with TET | $2.58 | 325,500 | 839,790 |
| 293 | **7517361 Total** | | | | | | | | 1,585,500 | 4,090,590 |
| 294 | 7557647 | 4/1/2019 | AX | 11/1/2020 | 11/30/2020 | 10,900 | NEXUS Nexus I/C with TET | $2.49 | 327,000 | 815,538 |
| 295 | 7557647 | 4/1/2019 | AX | 12/1/2020 | 12/31/2020 | 10,900 | NEXUS Nexus I/C with TET | $2.49 | 337,900 | 842,723 |
| 296 | 7557647 | 4/1/2019 | AX | 1/1/2021 | 1/31/2021 | 10,900 | NEXUS Nexus I/C with TET | $2.49 | 337,900 | 842,723 |
| 297 | 7557647 | 4/1/2019 | AX | 2/1/2021 | 2/28/2021 | 10,900 | NEXUS Nexus I/C with TET | $2.49 | 305,200 | 761,169 |
| 298 | 7557647 | 4/1/2019 | AX | 3/1/2021 | 3/31/2021 | 10,900 | NEXUS Nexus I/C with TET | $2.49 | 337,900 | 842,723 |
| 299 | **7557647 Total** | | | | | | | | 1,645,900 | 4,104,875 |
| 300 | 7557664 | 4/1/2019 | M | 4/1/2020 | 4/30/2020 | 5,000 | ANR S W Headstation | $2.23 | 150,000 | 334,500 |
| 301 | 7557664 | 4/1/2019 | M | 5/1/2020 | 5/31/2020 | 5,000 | ANR S W Headstation | $2.23 | 155,000 | 345,650 |
| 302 | 7557664 | 4/1/2019 | M | 6/1/2020 | 6/30/2020 | 5,000 | ANR S W Headstation | $2.23 | 150,000 | 334,500 |
| 303 | 7557664 | 4/1/2019 | M | 7/1/2020 | 7/31/2020 | 5,000 | ANR S W Headstation | $2.23 | 155,000 | 345,650 |
| 304 | 7557664 | 4/1/2019 | M | 8/1/2020 | 8/31/2020 | 5,000 | ANR S W Headstation | $2.23 | 155,000 | 345,650 |
| 305 | 7557664 | 4/1/2019 | M | 9/1/2020 | 9/30/2020 | 5,000 | ANR S W Headstation | $2.23 | 150,000 | 334,500 |
| 306 | 7557664 | 4/1/2019 | M | 10/1/2020 | 10/31/2020 | 5,000 | ANR S W Headstation | $2.23 | 155,000 | 345,650 |
| 307 | **7557664 Total** | | | | | | | | 1,070,000 | 2,386,100 |
| 308 | 7557706 | 4/1/2019 | C | 4/1/2020 | 4/30/2020 | 5,000 | ANR S W Headstation | $2.24 | 150,000 | 336,000 |
| 309 | 7557706 | 4/1/2019 | C | 5/1/2020 | 5/31/2020 | 5,000 | ANR S W Headstation | $2.24 | 155,000 | 347,200 |
| 310 | 7557706 | 4/1/2019 | C | 6/1/2020 | 6/30/2020 | 5,000 | ANR S W Headstation | $2.24 | 150,000 | 336,000 |
| 311 | 7557706 | 4/1/2019 | C | 7/1/2020 | 7/31/2020 | 5,000 | ANR S W Headstation | $2.24 | 155,000 | 347,200 |
| 312 | 7557706 | 4/1/2019 | C | 8/1/2020 | 8/31/2020 | 5,000 | ANR S W Headstation | $2.24 | 155,000 | 347,200 |
| 313 | 7557706 | 4/1/2019 | C | 9/1/2020 | 9/30/2020 | 5,000 | ANR S W Headstation | $2.24 | 150,000 | 336,000 |
| 314 | 7557706 | 4/1/2019 | C | 10/1/2020 | 10/31/2020 | 5,000 | ANR S W Headstation | $2.24 | 155,000 | 347,200 |
| 315 | **7557706 Total** | | | | | | | | 1,070,000 | 2,396,800 |
| 316 | 7561731 | 4/3/2019 | C | 4/1/2020 | 4/30/2020 | 3,000 | GRTLKE Emerson | $2.24 | 90,000 | 201,150 |
| 317 | 7561731 | 4/3/2019 | C | 5/1/2020 | 5/31/2020 | 3,000 | GRTLKE Emerson | $2.24 | 93,000 | 207,855 |
| 318 | 7561731 | 4/3/2019 | C | 6/1/2020 | 6/30/2020 | 3,000 | GRTLKE Emerson | $2.24 | 90,000 | 201,150 |
| 319 | 7561731 | 4/3/2019 | C | 7/1/2020 | 7/31/2020 | 3,000 | GRTLKE Emerson | $2.24 | 93,000 | 207,855 |
| 320 | 7561731 | 4/3/2019 | C | 8/1/2020 | 8/31/2020 | 2,759 | GRTLKE Emerson | $2.24 | 85,515 | 191,126 |
| 321 | 7561731 | 4/3/2019 | C | 9/1/2020 | 9/30/2020 | 2,978 | GRTLKE Emerson | $2.24 | 89,343 | 199,682 |
| 322 | 7561731 | 4/3/2019 | C | 10/1/2020 | 10/31/2020 | 3,000 | GRTLKE Emerson | $2.24 | 93,000 | 207,855 |
| 323 | **7561731 Total** | | | | | | | | 633,858 | 1,416,673 |
| 324 | 7613893 | 5/6/2019 | E | 4/1/2020 | 4/30/2020 | 13,100 | ANR S W Headstation | $2.17 | 393,000 | 852,810 |
| 325 | 7613893 | 5/6/2019 | E | 5/1/2020 | 5/31/2020 | 13,100 | ANR S W Headstation | $2.17 | 406,100 | 881,237 |
| 326 | 7613893 | 5/6/2019 | E | 6/1/2020 | 6/30/2020 | 13,100 | ANR S W Headstation | $2.17 | 393,000 | 852,810 |
| 327 | 7613893 | 5/6/2019 | E | 7/1/2020 | 7/31/2020 | 13,100 | ANR S W Headstation | $2.17 | 406,100 | 881,237 |
| 328 | 7613893 | 5/6/2019 | E | 8/1/2020 | 8/31/2020 | 13,100 | ANR S W Headstation | $2.17 | 406,100 | 881,237 |
| 329 | 7613893 | 5/6/2019 | E | 9/1/2020 | 9/30/2020 | 13,100 | ANR S W Headstation | $2.17 | 393,000 | 852,810 |
| 330 | **7613893 Total** | | | | | | | | 2,397,300 | 5,202,141 |
| 331 | 7615691 | 5/7/2019 | O | 11/1/2020 | 11/30/2020 | 10,400 | PEPL Pool - Field | $2.46 | 312,000 | 765,960 |
| 332 | 7615691 | 5/7/2019 | O | 12/1/2020 | 12/31/2020 | 10,400 | PEPL Pool - Field | $2.46 | 322,400 | 791,492 |
| 333 | 7615691 | 5/7/2019 | O | 1/1/2021 | 1/31/2021 | 10,400 | PEPL Pool - Field | $2.46 | 322,400 | 791,492 |
| 334 | 7615691 | 5/7/2019 | O | 2/1/2021 | 2/28/2021 | 10,400 | PEPL Pool - Field | $2.46 | 291,200 | 714,896 |
| 335 | 7615691 | 5/7/2019 | O | 3/1/2021 | 3/31/2021 | 10,400 | PEPL Pool - Field | $2.46 | 322,400 | 791,492 |
| 336 | **7615691 Total** | | | | | | | | 1,570,400 | 3,855,332 |
| 337 | 7617394 | 5/8/2019 | F | 4/1/2020 | 4/30/2020 | 1,300 | ANR S W Headstation | $2.25 | 39,000 | 87,750 |
| 338 | 7617394 | 5/8/2019 | F | 5/1/2020 | 5/31/2020 | 1,300 | ANR S W Headstation | $2.25 | 40,297 | 90,668 |
| 339 | 7617394 | 5/8/2019 | F | 6/1/2020 | 6/30/2020 | 1,300 | ANR S W Headstation | $2.25 | 39,000 | 87,750 |
| 340 | 7617394 | 5/8/2019 | F | 7/1/2020 | 7/31/2020 | 1,300 | ANR S W Headstation | $2.25 | 40,300 | 90,675 |
| 341 | 7617394 | 5/8/2019 | F | 8/1/2020 | 8/31/2020 | 1,300 | ANR S W Headstation | $2.25 | 40,300 | 90,675 |
| 342 | 7617394 | 5/8/2019 | F | 9/1/2020 | 9/30/2020 | 1,300 | ANR S W Headstation | $2.25 | 39,000 | 87,750 |
| 343 | 7617394 | 5/8/2019 | F | 10/1/2020 | 10/31/2020 | 1,300 | ANR S W Headstation | $2.25 | 40,300 | 90,675 |
| 344 | **7617394 Total** | | | | | | | | 278,197 | 625,943 |
| 345 | 7667897 | 6/6/2019 | BE | 4/1/2020 | 4/30/2020 | 9,834 | ANR S W Headstation | $2.14 | 295,032 | 629,893 |
| 346 | 7667897 | 6/6/2019 | BE | 5/1/2020 | 5/31/2020 | 10,000 | ANR S W Headstation | $2.14 | 310,000 | 661,850 |
| 347 | 7667897 | 6/6/2019 | BE | 6/1/2020 | 6/30/2020 | 10,000 | ANR S W Headstation | $2.14 | 300,000 | 640,500 |
| 348 | 7667897 | 6/6/2019 | BE | 7/1/2020 | 7/31/2020 | 10,000 | ANR S W Headstation | $2.14 | 310,000 | 661,850 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 349 | 7667897 | 6/6/2019 | BE | 8/1/2020 | 8/31/2020 | 10,000 | ANR S W Headstation | $2.14 | 310,000 | 661,850 |
| 350 | 7667897 | 6/6/2019 | BE | 9/1/2020 | 9/30/2020 | 10,000 | ANR S W Headstation | $2.14 | 300,000 | 640,500 |
| 351 | **7667897 Total** | | | | | | | | 1,825,032 | 3,896,443 |
| 352 | 7669731 | 6/7/2019 | AW | 4/1/2020 | 4/30/2020 | 4,700 | ANR S W Headstation | $2.14 | 141,000 | 301,740 |
| 353 | 7669731 | 6/7/2019 | AW | 5/1/2020 | 5/31/2020 | 4,700 | ANR S W Headstation | $2.14 | 145,700 | 311,798 |
| 354 | 7669731 | 6/7/2019 | AW | 6/1/2020 | 6/30/2020 | 4,700 | ANR S W Headstation | $2.14 | 141,000 | 301,740 |
| 355 | 7669731 | 6/7/2019 | AW | 7/1/2020 | 7/31/2020 | 4,700 | ANR S W Headstation | $2.14 | 145,700 | 311,798 |
| 356 | 7669731 | 6/7/2019 | AW | 8/1/2020 | 8/31/2020 | 4,700 | ANR S W Headstation | $2.14 | 145,700 | 311,798 |
| 357 | 7669731 | 6/7/2019 | AW | 9/1/2020 | 9/30/2020 | 4,700 | ANR S W Headstation | $2.14 | 141,000 | 301,740 |
| 358 | **7669731 Total** | | | | | | | | 860,100 | 1,840,614 |
| 359 | 7672492 | 6/10/2019 | O | 11/1/2020 | 11/30/2020 | 7,192 | ANR S W Headstation | $2.50 | 215,750 | 539,375 |
| 360 | 7672492 | 6/10/2019 | O | 12/1/2020 | 12/31/2020 | 7,200 | ANR S W Headstation | $2.50 | 223,200 | 558,000 |
| 361 | 7672492 | 6/10/2019 | O | 1/1/2021 | 1/31/2021 | 7,200 | ANR S W Headstation | $2.50 | 223,200 | 558,000 |
| 362 | 7672492 | 6/10/2019 | O | 2/1/2021 | 2/28/2021 | 7,176 | ANR S W Headstation | $2.50 | 200,921 | 502,303 |
| 363 | 7672492 | 6/10/2019 | O | 3/1/2021 | 3/31/2021 | 7,200 | ANR S W Headstation | $2.50 | 223,200 | 558,000 |
| 364 | **7672492 Total** | | | | | | | | 1,086,271 | 2,715,678 |
| 365 | 7672566 | 6/10/2019 | AX | 11/1/2020 | 11/30/2020 | 5,000 | NEXUS Nexus I/C with TET | $2.49 | 150,000 | 373,500 |
| 366 | 7672566 | 6/10/2019 | AX | 12/1/2020 | 12/31/2020 | 5,000 | NEXUS Nexus I/C with TET | $2.49 | 155,000 | 385,950 |
| 367 | 7672566 | 6/10/2019 | AX | 1/1/2021 | 1/31/2021 | 5,000 | NEXUS Nexus I/C with TET | $2.49 | 155,000 | 385,950 |
| 368 | 7672566 | 6/10/2019 | AX | 2/1/2021 | 2/28/2021 | 5,000 | NEXUS Nexus I/C with TET | $2.49 | 140,000 | 348,600 |
| 369 | 7672566 | 6/10/2019 | AX | 3/1/2021 | 3/31/2021 | 5,000 | NEXUS Nexus I/C with TET | $2.49 | 155,000 | 385,950 |
| 370 | **7672566 Total** | | | | | | | | 755,000 | 1,879,950 |
| 371 | 7715322 | 7/8/2019 | AW | 4/1/2020 | 4/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 150,000 | 342,000 |
| 372 | 7715322 | 7/8/2019 | AW | 5/1/2020 | 5/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 155,000 | 353,400 |
| 373 | 7715322 | 7/8/2019 | AW | 6/1/2020 | 6/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 150,000 | 342,000 |
| 374 | 7715322 | 7/8/2019 | AW | 7/1/2020 | 7/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 155,000 | 353,400 |
| 375 | 7715322 | 7/8/2019 | AW | 8/1/2020 | 8/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 155,000 | 353,400 |
| 376 | 7715322 | 7/8/2019 | AW | 9/1/2020 | 9/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 150,000 | 342,000 |
| 377 | **7715322 Total** | | | | | | | | 915,000 | 2,086,200 |
| 378 | 7715335 | 7/8/2019 | R | 4/1/2020 | 4/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 150,000 | 341,250 |
| 379 | 7715335 | 7/8/2019 | R | 5/1/2020 | 5/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 155,000 | 352,625 |
| 380 | 7715335 | 7/8/2019 | R | 6/1/2020 | 6/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 150,000 | 341,250 |
| 381 | 7715335 | 7/8/2019 | R | 7/1/2020 | 7/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 155,000 | 352,625 |
| 382 | 7715335 | 7/8/2019 | R | 8/1/2020 | 8/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 155,000 | 352,625 |
| 383 | 7715335 | 7/8/2019 | R | 9/1/2020 | 9/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.28 | 150,000 | 341,250 |
| 384 | **7715335 Total** | | | | | | | | 915,000 | 2,081,625 |
| 385 | 7715347 | 7/8/2019 | F | 4/1/2020 | 4/30/2020 | 5,400 | MICHCON Michcon Cityga | $2.28 | 162,000 | 368,550 |
| 386 | 7715347 | 7/8/2019 | F | 5/1/2020 | 5/31/2020 | 5,400 | MICHCON Michcon Cityga | $2.28 | 167,400 | 380,835 |
| 387 | 7715347 | 7/8/2019 | F | 6/1/2020 | 6/30/2020 | 5,400 | MICHCON Michcon Cityga | $2.28 | 162,000 | 368,550 |
| 388 | 7715347 | 7/8/2019 | F | 7/1/2020 | 7/31/2020 | 5,400 | MICHCON Michcon Cityga | $2.28 | 167,400 | 380,835 |
| 389 | 7715347 | 7/8/2019 | F | 8/1/2020 | 8/31/2020 | 5,400 | MICHCON Michcon Cityga | $2.28 | 167,400 | 380,835 |
| 390 | 7715347 | 7/8/2019 | F | 9/1/2020 | 9/30/2020 | 5,400 | MICHCON Michcon Cityga | $2.28 | 162,000 | 368,550 |
| 391 | **7715347 Total** | | | | | | | | 988,200 | 2,248,155 |
| 392 | 7718488 | 7/9/2019 | F | 11/1/2020 | 11/30/2020 | 6,900 | PEPL Pool - Field | $2.42 | 207,000 | 499,905 |
| 393 | 7718488 | 7/9/2019 | F | 12/1/2020 | 12/31/2020 | 6,900 | PEPL Pool - Field | $2.42 | 213,900 | 516,569 |
| 394 | 7718488 | 7/9/2019 | F | 1/1/2021 | 1/31/2021 | 6,900 | PEPL Pool - Field | $2.42 | 213,900 | 516,569 |
| 395 | 7718488 | 7/9/2019 | F | 2/1/2021 | 2/28/2021 | 6,900 | PEPL Pool - Field | $2.42 | 193,200 | 466,578 |
| 396 | 7718488 | 7/9/2019 | F | 3/1/2021 | 3/31/2021 | 6,900 | PEPL Pool - Field | $2.42 | 213,900 | 516,569 |
| 397 | **7718488 Total** | | | | | | | | 1,041,900 | 2,516,189 |
| 398 | 7718489 | 7/9/2019 | C | 11/1/2020 | 11/30/2020 | 6,000 | PEPL Pool - Field | $2.42 | 180,000 | 435,600 |
| 399 | 7718489 | 7/9/2019 | C | 12/1/2020 | 12/31/2020 | 6,000 | PEPL Pool - Field | $2.42 | 186,000 | 450,120 |
| 400 | 7718489 | 7/9/2019 | C | 1/1/2021 | 1/31/2021 | 6,000 | PEPL Pool - Field | $2.42 | 186,000 | 450,120 |
| 401 | 7718489 | 7/9/2019 | C | 2/1/2021 | 2/28/2021 | 6,000 | PEPL Pool - Field | $2.42 | 168,000 | 406,560 |
| 402 | 7718489 | 7/9/2019 | C | 3/1/2021 | 3/31/2021 | 6,000 | PEPL Pool - Field | $2.42 | 186,000 | 450,120 |
| 403 | **7718489 Total** | | | | | | | | 906,000 | 2,192,520 |
| 404 | 7761428 | 8/5/2019 | AW | 4/1/2020 | 4/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.18 | 300,000 | 652,500 |
| 405 | 7761428 | 8/5/2019 | AW | 5/1/2020 | 5/31/2020 | 10,000 | MICHCON Michcon Cityga | $2.18 | 310,000 | 674,250 |
| 406 | 7761428 | 8/5/2019 | AW | 6/1/2020 | 6/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.18 | 300,000 | 652,500 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 407 | 7761428 | 8/5/2019 | AW | 7/1/2020 | 7/31/2020 | 10,000 | MICHCON Michcon Citygа | $2.18 | 310,000 | 674,250 |
| 408 | 7761428 | 8/5/2019 | AW | 8/1/2020 | 8/31/2020 | 10,000 | MICHCON Michcon Citygа | $2.18 | 310,000 | 674,250 |
| 409 | 7761428 | 8/5/2019 | AW | 9/1/2020 | 9/30/2020 | 10,000 | MICHCON Michcon Citygа | $2.18 | 300,000 | 652,500 |
| 410 | **7761428 Total** | | | | | | | | 1,830,000 | 3,980,250 |
| 411 | 7761447 | 8/5/2019 | R | 4/1/2020 | 4/30/2020 | 5,400 | MICHCON Michcon Citygа | $2.19 | 162,000 | 353,970 |
| 412 | 7761447 | 8/5/2019 | R | 5/1/2020 | 5/31/2020 | 5,400 | MICHCON Michcon Citygа | $2.19 | 167,400 | 365,769 |
| 413 | 7761447 | 8/5/2019 | R | 6/1/2020 | 6/30/2020 | 5,400 | MICHCON Michcon Citygа | $2.19 | 162,000 | 353,970 |
| 414 | 7761447 | 8/5/2019 | R | 7/1/2020 | 7/31/2020 | 5,400 | MICHCON Michcon Citygа | $2.19 | 167,400 | 365,769 |
| 415 | 7761447 | 8/5/2019 | R | 8/1/2020 | 8/31/2020 | 5,400 | MICHCON Michcon Citygа | $2.19 | 167,400 | 365,769 |
| 416 | 7761447 | 8/5/2019 | R | 9/1/2020 | 9/30/2020 | 5,400 | MICHCON Michcon Citygа | $2.19 | 162,000 | 353,970 |
| 417 | **7761447 Total** | | | | | | | | 988,200 | 2,159,217 |
| 418 | 7765529 | 8/7/2019 | E | 11/1/2020 | 11/30/2020 | 4,300 | PEPL Pool - Field | $2.29 | 129,000 | 294,765 |
| 419 | 7765529 | 8/7/2019 | E | 12/1/2020 | 12/31/2020 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 420 | 7765529 | 8/7/2019 | E | 1/1/2021 | 1/31/2021 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 421 | 7765529 | 8/7/2019 | E | 2/1/2021 | 2/28/2021 | 4,300 | PEPL Pool - Field | $2.29 | 120,400 | 275,114 |
| 422 | 7765529 | 8/7/2019 | E | 3/1/2021 | 3/31/2021 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 423 | **7765529 Total** | | | | | | | | 649,300 | 1,483,651 |
| 424 | 7765543 | 8/7/2019 | C | 11/1/2020 | 11/30/2020 | 4,300 | PEPL Pool - Field | $2.29 | 129,000 | 294,765 |
| 425 | 7765543 | 8/7/2019 | C | 12/1/2020 | 12/31/2020 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 426 | 7765543 | 8/7/2019 | C | 1/1/2021 | 1/31/2021 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 427 | 7765543 | 8/7/2019 | C | 2/1/2021 | 2/28/2021 | 4,300 | PEPL Pool - Field | $2.29 | 120,400 | 275,114 |
| 428 | 7765543 | 8/7/2019 | C | 3/1/2021 | 3/31/2021 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 429 | **7765543 Total** | | | | | | | | 649,300 | 1,483,651 |
| 430 | 7765550 | 8/7/2019 | M | 11/1/2020 | 11/30/2020 | 4,300 | PEPL Pool - Field | $2.29 | 129,000 | 294,765 |
| 431 | 7765550 | 8/7/2019 | M | 12/1/2020 | 12/31/2020 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 432 | 7765550 | 8/7/2019 | M | 1/1/2021 | 1/31/2021 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 433 | 7765550 | 8/7/2019 | M | 2/1/2021 | 2/28/2021 | 4,219 | PEPL Pool - Field | $2.29 | 118,135 | 269,938 |
| 434 | 7765550 | 8/7/2019 | M | 3/1/2021 | 3/31/2021 | 4,300 | PEPL Pool - Field | $2.29 | 133,300 | 304,591 |
| 435 | **7765550 Total** | | | | | | | | 647,035 | 1,478,475 |
| 436 | 7813016 | 9/5/2019 | E | 4/1/2020 | 4/30/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 150,000 | 329,250 |
| 437 | 7813016 | 9/5/2019 | E | 5/1/2020 | 5/31/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 155,000 | 340,225 |
| 438 | 7813016 | 9/5/2019 | E | 6/1/2020 | 6/30/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 150,000 | 329,250 |
| 439 | 7813016 | 9/5/2019 | E | 7/1/2020 | 7/31/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 155,000 | 340,225 |
| 440 | 7813016 | 9/5/2019 | E | 8/1/2020 | 8/31/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 155,000 | 340,225 |
| 441 | 7813016 | 9/5/2019 | E | 9/1/2020 | 9/30/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 150,000 | 329,250 |
| 442 | **7813016 Total** | | | | | | | | 915,000 | 2,008,425 |
| 443 | 7813025 | 9/5/2019 | F | 4/1/2020 | 4/30/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 150,000 | 330,000 |
| 444 | 7813025 | 9/5/2019 | F | 5/1/2020 | 5/31/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 155,000 | 341,000 |
| 445 | 7813025 | 9/5/2019 | F | 6/1/2020 | 6/30/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 150,000 | 330,000 |
| 446 | 7813025 | 9/5/2019 | F | 7/1/2020 | 7/31/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 155,000 | 341,000 |
| 447 | 7813025 | 9/5/2019 | F | 8/1/2020 | 8/31/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 155,000 | 341,000 |
| 448 | 7813025 | 9/5/2019 | F | 9/1/2020 | 9/30/2020 | 5,000 | MICHCON Michcon Citygа | $2.20 | 150,000 | 330,000 |
| 449 | **7813025 Total** | | | | | | | | 915,000 | 2,013,000 |
| 450 | 7813026 | 9/5/2019 | Q | 4/1/2020 | 4/30/2020 | 5,300 | MICHCON Michcon Citygа | $2.20 | 159,000 | 349,800 |
| 451 | 7813026 | 9/5/2019 | Q | 5/1/2020 | 5/31/2020 | 5,300 | MICHCON Michcon Citygа | $2.20 | 164,300 | 361,460 |
| 452 | 7813026 | 9/5/2019 | Q | 6/1/2020 | 6/30/2020 | 5,300 | MICHCON Michcon Citygа | $2.20 | 159,000 | 349,800 |
| 453 | 7813026 | 9/5/2019 | Q | 7/1/2020 | 7/31/2020 | 5,300 | MICHCON Michcon Citygа | $2.20 | 164,300 | 361,460 |
| 454 | 7813026 | 9/5/2019 | Q | 8/1/2020 | 8/31/2020 | 5,300 | MICHCON Michcon Citygа | $2.20 | 164,300 | 361,460 |
| 455 | 7813026 | 9/5/2019 | Q | 9/1/2020 | 9/30/2020 | 5,300 | MICHCON Michcon Citygа | $2.20 | 159,000 | 349,800 |
| 456 | **7813026 Total** | | | | | | | | 969,900 | 2,133,780 |
| 457 | 7813454 | 9/5/2019 | M | 11/1/2020 | 11/30/2020 | 6,350 | ANR S W Headstation | $2.33 | 190,500 | 443,865 |
| 458 | 7813454 | 9/5/2019 | M | 12/1/2020 | 12/31/2020 | 6,350 | ANR S W Headstation | $2.33 | 196,850 | 458,661 |
| 459 | 7813454 | 9/5/2019 | M | 1/1/2021 | 1/31/2021 | 6,350 | ANR S W Headstation | $2.33 | 196,850 | 458,661 |
| 460 | 7813454 | 9/5/2019 | M | 2/1/2021 | 2/28/2021 | 6,291 | ANR S W Headstation | $2.33 | 176,146 | 410,420 |
| 461 | 7813454 | 9/5/2019 | M | 3/1/2021 | 3/31/2021 | 6,350 | ANR S W Headstation | $2.33 | 196,850 | 458,661 |
| 462 | **7813454 Total** | | | | | | | | 957,196 | 2,230,267 |
| 463 | 7813455 | 9/5/2019 | E | 11/1/2020 | 11/30/2020 | 6,350 | ANR S W Headstation | $2.33 | 190,500 | 443,865 |
| 464 | 7813455 | 9/5/2019 | E | 12/1/2020 | 12/31/2020 | 6,350 | ANR S W Headstation | $2.33 | 196,850 | 458,661 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 465 | 7813455 | 9/5/2019 | E | 1/1/2021 | 1/31/2021 | 6,350 | ANR S W Headstation | $2.33 | 196,850 | 458,661 |
| 466 | 7813455 | 9/5/2019 | E | 2/1/2021 | 2/28/2021 | 6,310 | ANR S W Headstation | $2.33 | 176,682 | 411,669 |
| 467 | 7813455 | 9/5/2019 | E | 3/1/2021 | 3/31/2021 | 6,350 | ANR S W Headstation | $2.33 | 196,850 | 458,661 |
| 468 | **7813455 Total** | | | | | | | | 957,732 | 2,231,516 |
| 469 | 7859591 | 10/2/2019 | F | 11/1/2020 | 11/30/2020 | 10,000 | ANR S W Headstation | $2.32 | 300,000 | 694,500 |
| 470 | 7859591 | 10/2/2019 | F | 12/1/2020 | 12/31/2020 | 10,000 | ANR S W Headstation | $2.32 | 310,000 | 717,650 |
| 471 | 7859591 | 10/2/2019 | F | 1/1/2021 | 1/31/2021 | 10,000 | ANR S W Headstation | $2.32 | 310,000 | 717,650 |
| 472 | 7859591 | 10/2/2019 | F | 2/1/2021 | 2/28/2021 | 9,403 | ANR S W Headstation | $2.32 | 263,295 | 609,528 |
| 473 | 7859591 | 10/2/2019 | F | 3/1/2021 | 3/31/2021 | 10,000 | ANR S W Headstation | $2.32 | 310,000 | 717,650 |
| 474 | **7859591 Total** | | | | | | | | 1,493,295 | 3,456,978 |
| 475 | 7869493 | 10/8/2019 | AQ | 4/1/2020 | 4/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.10 | 300,000 | 630,000 |
| 476 | 7869493 | 10/8/2019 | AQ | 5/1/2020 | 5/31/2020 | 10,000 | MICHCON Michcon Cityga | $2.10 | 310,000 | 651,000 |
| 477 | 7869493 | 10/8/2019 | AQ | 6/1/2020 | 6/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.10 | 300,000 | 630,000 |
| 478 | 7869493 | 10/8/2019 | AQ | 7/1/2020 | 7/31/2020 | 10,000 | MICHCON Michcon Cityga | $2.10 | 310,000 | 651,000 |
| 479 | 7869493 | 10/8/2019 | AQ | 8/1/2020 | 8/31/2020 | 10,000 | MICHCON Michcon Cityga | $2.10 | 310,000 | 651,000 |
| 480 | 7869493 | 10/8/2019 | AQ | 9/1/2020 | 9/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.10 | 300,000 | 630,000 |
| 481 | **7869493 Total** | | | | | | | | 1,830,000 | 3,843,000 |
| 482 | 7871365 | 10/9/2019 | BC | 4/1/2020 | 4/30/2020 | 5,900 | MICHCON Michcon Cityga | $2.10 | 177,000 | 371,523 |
| 483 | 7871365 | 10/9/2019 | BC | 5/1/2020 | 5/31/2020 | 5,900 | MICHCON Michcon Cityga | $2.10 | 182,900 | 383,907 |
| 484 | 7871365 | 10/9/2019 | BC | 6/1/2020 | 6/30/2020 | 5,900 | MICHCON Michcon Cityga | $2.10 | 177,000 | 371,523 |
| 485 | 7871365 | 10/9/2019 | BC | 7/1/2020 | 7/31/2020 | 5,900 | MICHCON Michcon Cityga | $2.10 | 182,900 | 383,907 |
| 486 | 7871365 | 10/9/2019 | BC | 8/1/2020 | 8/31/2020 | 5,900 | MICHCON Michcon Cityga | $2.10 | 182,900 | 383,907 |
| 487 | 7871365 | 10/9/2019 | BC | 9/1/2020 | 9/30/2020 | 5,900 | MICHCON Michcon Cityga | $2.10 | 177,000 | 371,523 |
| 488 | **7871365 Total** | | | | | | | | 1,079,700 | 2,266,290 |
| 489 | 7871447 | 10/9/2019 | Q | 11/1/2020 | 11/30/2020 | 4,300 | ANR Rex Shelbyville | $2.52 | 129,000 | 324,435 |
| 490 | 7871447 | 10/9/2019 | Q | 12/1/2020 | 12/31/2020 | 4,300 | ANR Rex Shelbyville | $2.52 | 133,300 | 335,250 |
| 491 | 7871447 | 10/9/2019 | Q | 1/1/2021 | 1/31/2021 | 4,300 | ANR Rex Shelbyville | $2.52 | 133,300 | 335,250 |
| 492 | 7871447 | 10/9/2019 | Q | 2/1/2021 | 2/28/2021 | 4,270 | ANR Rex Shelbyville | $2.52 | 119,551 | 300,671 |
| 493 | 7871447 | 10/9/2019 | Q | 3/1/2021 | 3/31/2021 | 4,300 | ANR Rex Shelbyville | $2.52 | 133,300 | 335,250 |
| 494 | **7871447 Total** | | | | | | | | 648,451 | 1,630,854 |
| 495 | 7871451 | 10/9/2019 | BF | 4/1/2020 | 4/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 150,000 | 314,250 |
| 496 | 7871451 | 10/9/2019 | BF | 5/1/2020 | 5/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 155,000 | 324,725 |
| 497 | 7871451 | 10/9/2019 | BF | 6/1/2020 | 6/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 150,000 | 314,250 |
| 498 | 7871451 | 10/9/2019 | BF | 7/1/2020 | 7/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 155,000 | 324,725 |
| 499 | 7871451 | 10/9/2019 | BF | 8/1/2020 | 8/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 155,000 | 324,725 |
| 500 | 7871451 | 10/9/2019 | BF | 9/1/2020 | 9/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 150,000 | 314,250 |
| 501 | **7871451 Total** | | | | | | | | 915,000 | 1,916,925 |
| 502 | 7921193 | 11/6/2019 | F | 4/1/2020 | 4/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.27 | 300,000 | 681,000 |
| 503 | 7921193 | 11/6/2019 | F | 5/1/2020 | 5/31/2020 | 10,000 | MICHCON Michcon Cityga | $2.27 | 310,000 | 703,700 |
| 504 | 7921193 | 11/6/2019 | F | 6/1/2020 | 6/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.27 | 300,000 | 681,000 |
| 505 | 7921193 | 11/6/2019 | F | 7/1/2020 | 7/31/2020 | 10,000 | MICHCON Michcon Cityga | $2.27 | 310,000 | 703,700 |
| 506 | 7921193 | 11/6/2019 | F | 8/1/2020 | 8/31/2020 | 10,000 | MICHCON Michcon Cityga | $2.27 | 310,000 | 703,700 |
| 507 | 7921193 | 11/6/2019 | F | 9/1/2020 | 9/30/2020 | 10,000 | MICHCON Michcon Cityga | $2.27 | 300,000 | 681,000 |
| 508 | **7921193 Total** | | | | | | | | 1,830,000 | 4,154,100 |
| 509 | 7921199 | 11/5/2019 | Q | 4/1/2020 | 4/30/2020 | 7,100 | MICHCON Michcon Cityga | $2.26 | 213,000 | 481,380 |
| 510 | 7921199 | 11/5/2019 | Q | 5/1/2020 | 5/31/2020 | 7,100 | MICHCON Michcon Cityga | $2.26 | 220,100 | 497,426 |
| 511 | 7921199 | 11/5/2019 | Q | 6/1/2020 | 6/30/2020 | 7,100 | MICHCON Michcon Cityga | $2.26 | 213,000 | 481,380 |
| 512 | 7921199 | 11/5/2019 | Q | 7/1/2020 | 7/31/2020 | 7,100 | MICHCON Michcon Cityga | $2.26 | 220,100 | 497,426 |
| 513 | 7921199 | 11/5/2019 | Q | 8/1/2020 | 8/31/2020 | 7,100 | MICHCON Michcon Cityga | $2.26 | 220,100 | 497,426 |
| 514 | 7921199 | 11/5/2019 | Q | 9/1/2020 | 9/30/2020 | 7,100 | MICHCON Michcon Cityga | $2.26 | 213,000 | 481,380 |
| 515 | **7921199 Total** | | | | | | | | 1,299,300 | 2,936,418 |
| 516 | 7924582 | 11/6/2019 | C | 11/1/2020 | 11/30/2020 | 5,200 | ANR Rex Shelbyville | $2.59 | 156,000 | 403,260 |
| 517 | 7924582 | 11/6/2019 | C | 12/1/2020 | 12/31/2020 | 5,200 | ANR Rex Shelbyville | $2.59 | 161,200 | 416,702 |
| 518 | 7924582 | 11/6/2019 | C | 1/1/2021 | 1/31/2021 | 5,200 | ANR Rex Shelbyville | $2.59 | 161,200 | 416,702 |
| 519 | 7924582 | 11/6/2019 | C | 2/1/2021 | 2/28/2021 | 5,200 | ANR Rex Shelbyville | $2.59 | 145,600 | 376,376 |
| 520 | 7924582 | 11/6/2019 | C | 3/1/2021 | 3/31/2021 | 5,200 | ANR Rex Shelbyville | $2.59 | 161,200 | 416,702 |
| 521 | **7924582 Total** | | | | | | | | 785,200 | 2,029,742 |
| 522 | 7967147 | 12/3/2019 | BC | 4/1/2020 | 4/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 150,000 | 314,550 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 523 | 7967147 | 12/3/2019 | BC | 5/1/2020 | 5/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 155,000 | 325,035 |
| 524 | 7967147 | 12/3/2019 | BC | 6/1/2020 | 6/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 150,000 | 314,550 |
| 525 | 7967147 | 12/3/2019 | BC | 7/1/2020 | 7/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 155,000 | 325,035 |
| 526 | 7967147 | 12/3/2019 | BC | 8/1/2020 | 8/31/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 155,000 | 325,035 |
| 527 | 7967147 | 12/3/2019 | BC | 9/1/2020 | 9/30/2020 | 5,000 | MICHCON Michcon Cityga | $2.10 | 150,000 | 314,550 |
| 528 | **7967147 Total** | | | | | | | | 915,000 | 1,918,755 |
| 529 | 7967163 | 12/3/2019 | O | 4/1/2020 | 4/30/2020 | 8,100 | MICHCON Michcon Cityga | $2.09 | 243,000 | 507,870 |
| 530 | 7967163 | 12/3/2019 | O | 5/1/2020 | 5/31/2020 | 8,100 | MICHCON Michcon Cityga | $2.09 | 251,100 | 524,799 |
| 531 | 7967163 | 12/3/2019 | O | 6/1/2020 | 6/30/2020 | 8,100 | MICHCON Michcon Cityga | $2.09 | 243,000 | 507,870 |
| 532 | 7967163 | 12/3/2019 | O | 7/1/2020 | 7/31/2020 | 8,100 | MICHCON Michcon Cityga | $2.09 | 251,100 | 524,799 |
| 533 | 7967163 | 12/3/2019 | O | 8/1/2020 | 8/31/2020 | 8,100 | MICHCON Michcon Cityga | $2.09 | 251,100 | 524,799 |
| 534 | 7967163 | 12/3/2019 | O | 9/1/2020 | 9/30/2020 | 8,100 | MICHCON Michcon Cityga | $2.09 | 243,000 | 507,870 |
| 535 | **7967163 Total** | | | | | | | | 1,482,300 | 3,098,007 |
| 536 | 7969442 | 12/4/2019 | E | 11/1/2020 | 11/30/2020 | 1,700 | MICHCON Michcon Cityga | $2.45 | 51,000 | 124,695 |
| 537 | 7969442 | 12/4/2019 | E | 12/1/2020 | 12/31/2020 | 1,700 | MICHCON Michcon Cityga | $2.45 | 52,700 | 128,852 |
| 538 | 7969442 | 12/4/2019 | E | 1/1/2021 | 1/31/2021 | 1,700 | MICHCON Michcon Cityga | $2.45 | 52,700 | 128,852 |
| 539 | 7969442 | 12/4/2019 | E | 2/1/2021 | 2/28/2021 | 1,700 | MICHCON Michcon Cityga | $2.45 | 47,600 | 116,382 |
| 540 | 7969442 | 12/4/2019 | E | 3/1/2021 | 3/31/2021 | 1,700 | MICHCON Michcon Cityga | $2.45 | 52,700 | 128,852 |

2020-21 GCR YEAR FIXED PRICE PURCHASE DEAL SUMMARY

| Line | Deal No. | Trade Date | Supplier | Delivery Start | Delivery End | Contracted Daily Volume (Dth/day) | Receipt Point | Physical Fixed Price ($/Dth) | Delivered Volume (Dth) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) |
| 541 | **7969442 Total** | | | | | | | | 256,700 | 627,632 |
| 542 | 8319171 | 6/19/2020 | C | 6/16/2020 | 6/16/2020 | 8,200 | MICHCON Michcon Cityga | $2.16 | 8,200 | 17,712 |
| 543 | **8319171 Total** | | | | | | | | 8,200 | 17,712 |
| 544 | 8319175 | 6/19/2020 | C | 6/17/2020 | 6/17/2020 | 8,200 | MICHCON Michcon Cityga | $2.12 | 8,200 | 17,384 |
| 545 | **8319175 Total** | | | | | | | | 8,200 | 17,384 |
| 546 | 8319181 | 6/19/2020 | C | 6/18/2020 | 6/18/2020 | 8,200 | MICHCON Michcon Cityga | $2.11 | 8,200 | 17,261 |
| 547 | **8319181 Total** | | | | | | | | 8,200 | 17,261 |
| 548 | 8319272 | 6/19/2020 | AQ | 6/16/2020 | 6/16/2020 | 12,800 | MICHCON Michcon Cityga | $2.11 | 12,800 | 27,008 |
| 549 | **8319272 Total** | | | | | | | | 12,800 | 27,008 |
| 550 | 8319284 | 6/19/2020 | AQ | 6/17/2020 | 6/17/2020 | 12,800 | MICHCON Michcon Cityga | $2.07 | 12,800 | 26,496 |
| 551 | **8319284 Total** | | | | | | | | 12,800 | 26,496 |
| 552 | 8319288 | 6/19/2020 | AQ | 6/18/2020 | 6/18/2020 | 12,800 | MICHCON Michcon Cityga | $2.06 | 12,800 | 26,304 |
| 553 | **8319288 Total** | | | | | | | | 12,800 | 26,304 |
| 554 | 8372658 | 7/9/2020 | C | 7/8/2020 | 7/8/2020 | 4,643 | MICHCON Michcon Cityga | $2.50 | 4,643 | 11,608 |
| 555 | **8372658 Total** | | | | | | | | 4,643 | 11,608 |
| 556 | 8372692 | 7/9/2020 | C | 7/9/2020 | 7/9/2020 | 4,513 | MICHCON Michcon Cityga | $2.45 | 4,513 | 11,034 |
| 557 | **8372692 Total** | | | | | | | | 4,513 | 11,034 |
| 558 | 8456091 | 8/31/2020 | C | 8/13/2020 | 8/13/2020 | 1,734 | MICHCON Michcon Cityga | $2.26 | 1,734 | 3,910 |
| 559 | **8456091 Total** | | | | | | | | 1,734 | 3,910 |
| 560 | 8456125 | 8/31/2020 | C | 8/14/2020 | 8/14/2020 | 1,291 | MICHCON Michcon Cityga | $2.27 | 1,291 | 2,924 |
| 561 | **8456125 Total** | | | | | | | | 1,291 | 2,924 |
| 562 | 8456187 | 8/31/2020 | C | 8/15/2020 | 8/17/2020 | 1,136 | MICHCON Michcon Cityga | $2.30 | 1,136 | 2,613 |
| 563 | 8456187 | 8/31/2020 | C | 8/15/2020 | 8/17/2020 | 131 | MICHCON Michcon Cityga | $2.30 | 131 | 301 |
| 564 | 8456187 | 8/31/2020 | C | 8/15/2020 | 8/17/2020 | 1,093 | MICHCON Michcon Cityga | $2.30 | 1,093 | 2,514 |
| 565 | **8456187 Total** | | | | | | | | 2,360 | 5,428 |
| 566 | 8456210 | 8/31/2020 | C | 8/18/2020 | 8/18/2020 | 214 | MICHCON Michcon Cityga | $2.26 | 214 | 483 |
| 567 | **8456210 Total** | | | | | | | | 214 | 483 |
| 568 | 8456274 | 8/31/2020 | C | 8/28/2020 | 8/28/2020 | 128 | MICHCON Michcon Cityga | $2.20 | 128 | 282 |
| 569 | **8456274 Total** | | | | | | | | 128 | 282 |
| 570 | 8456298 | 8/31/2020 | C | 8/29/2020 | 8/31/2020 | 561 | MICHCON Michcon Cityga | $2.24 | 561 | 1,254 |
| 571 | 8456298 | 8/31/2020 | C | 8/29/2020 | 8/31/2020 | 606 | MICHCON Michcon Cityga | $2.24 | 606 | 1,354 |
| 572 | 8456298 | 8/31/2020 | C | 8/29/2020 | 8/31/2020 | 591 | MICHCON Michcon Cityga | $2.24 | 591 | 1,321 |
| 573 | **8456298 Total** | | | | | | | | 1,758 | 3,929 |
| 574 | 8456674 | 9/1/2020 | AW | 8/17/2020 | 8/17/2020 | 7,186 | MICHCON Michcon Cityga | $2.34 | 7,186 | 16,815 |
| 575 | **8456674 Total** | | | | | | | | 7,186 | 16,815 |
| 576 | 8470359 | 8/31/2020 | AQ | 8/26/2020 | 8/28/2020 | 1,031 | GRTLKE Emerson | $2.33 | 3,093 | 7,191 |
| 577 | **8470359 Total** | | | | | | | | 3,093 | 7,191 |
| 578 | 8486091 | 9/30/2020 | C | 9/9/2020 | 9/9/2020 | 42 | MICHCON Michcon Cityga | $2.51 | 42 | 105 |
| 579 | **8486091 Total** | | | | | | | | 42 | 105 |
| 580 | 8486094 | 9/30/2020 | C | 9/16/2020 | 9/16/2020 | 1,681 | MICHCON Michcon Cityga | $2.91 | 1,681 | 4,892 |
| 581 | **8486094 Total** | | | | | | | | 1,681 | 4,892 |
| 582 | 8486106 | 9/30/2020 | C | 9/17/2020 | 9/17/2020 | 1,398 | MICHCON Michcon Cityga | $3.16 | 1,398 | 4,418 |
| 583 | **8486106 Total** | | | | | | | | 1,398 | 4,418 |
| 584 | 8486109 | 9/30/2020 | C | 9/18/2020 | 9/18/2020 | 1,079 | MICHCON Michcon Cityga | $2.96 | 1,079 | 3,194 |
| 585 | **8486109 Total** | | | | | | | | 1,079 | 3,194 |
| 586 | 8486110 | 9/30/2020 | C | 9/19/2020 | 9/20/2020 | 382 | MICHCON Michcon Cityga | $2.88 | 764 | 2,200 |
| 587 | **8486110 Total** | | | | | | | | 764 | 2,200 |
| 588 | 8511758 | 9/30/2020 | C | 9/11/2020 | 9/11/2020 | 657 | MICHCON Michcon Cityga | $2.24 | 657 | 1,468 |
| 589 | **8511758 Total** | | | | | | | | 657 | 1,468 |
| 590 | 8544518 | 10/5/2020 | C | 10/5/2020 | 10/5/2020 | 45,729 | MICHCON Michcon Cityga | $2.05 | 45,729 | 93,744 |
| 591 | **8544518 Total** | | | | | | | | 45,729 | 93,744 |
| 592 | 8544534 | 10/5/2020 | AQ | 10/5/2020 | 10/5/2020 | 33,694 | MICHCON Michcon Cityga | $2.01 | 33,694 | 67,753 |
| 593 | **8544534 Total** | | | | | | | | 33,694 | 67,753 |
| 594 | 8659557 | 1/14/2021 | AA | 1/14/2021 | 1/14/2021 | 23,917 | MICHCON Michcon Cityga | $1.86 | 23,917 | 44,533 |
| 595 | **8659557 Total** | | | | | | | | 23,917 | 44,533 |
| 596 | **Grand Total** | | | | | | | | 100,518,986 | 225,966,782 |

DTE Gas Company
Fixed Price Purchases
April 2020-March 2021

Case No: U-20544
Witness: E.P. Schiffer
Exhibit No: A-2


2020 - 21 GCR YEAR FIXED PRICE COMPARED TO INDEX

| Line | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) | (col. k) | (col. l) | (col. m) | (col. n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Location | Apr-20 | May-20 | Jun-20 | Jul-20 | Aug-20 | Sep-20 | Oct-20 | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 | Total |
| 1 | Fixed Price Volume (Dth): | | | | | | | | | | | | | |
| 2 | ANR Southwest Field | 2,392,032 | 2,476,865 | 2,397,000 | 2,476,900 | 2,476,900 | 2,396,713 | 1,615,100 | 2,411,750 | 2,492,400 | 2,492,400 | 2,187,020 | 2,492,400 | 28,307,480 |
| 3 | Great Lakes-Emerson | 855,000 | 883,500 | 855,000 | 883,500 | 868,580 | 854,343 | 883,500 | 830,999 | 858,700 | 858,700 | 775,600 | 858,700 | 10,266,122 |
| 4 | MichCon city-gate | 2,916,000 | 3,013,200 | 2,979,000 | 3,022,356 | 3,027,871 | 2,926,408 | 79,423 | 51,000 | 52,700 | 76,617 | 47,600 | 52,700 | 18,244,875 |
| 5 | Panhandle Field Zone | 1,974,000 | 2,039,800 | 1,974,000 | 2,039,800 | 2,039,800 | 1,974,000 | 2,039,800 | 2,010,000 | 2,077,000 | 2,077,000 | 1,865,524 | 2,077,000 | 24,187,724 |
| 6 | Viking-Emerson | 630,000 | 651,000 | 567,000 | 651,000 | 651,000 | 630,000 | 571,235 | 570,000 | 589,000 | 589,000 | 532,000 | 503,366 | 7,134,601 |
| 7 | NEXUS - Clarington | 1,140,000 | 1,178,000 | 1,140,000 | 1,138,981 | 1,178,000 | 1,125,254 | 1,178,000 | 1,107,000 | 1,143,900 | 1,143,900 | 1,033,200 | 1,143,900 | 13,650,135 |
| 8 | ANR ML-3 | - | - | - | - | - | - | - | 285,000 | 294,500 | 294,500 | 265,151 | 294,500 | 1,433,651 |
| 9 | Total | 9,907,032 | 10,242,365 | 9,912,000 | 10,212,537 | 10,242,151 | 9,906,718 | 6,367,058 | 7,265,749 | 7,508,200 | 7,532,117 | 6,706,095 | 7,422,566 | 103,224,588 |
| 10 | | | | | | | | | | | | | | |
| 11 | Fixed Price ($/Dth): | | | | | | | | | | | | | |
| 12 | ANR Southwest Field | $2.156 | $2.156 | $2.156 | $2.156 | $2.156 | $2.156 | $2.159 | $2.446 | $2.446 | $2.446 | $2.447 | $2.446 | |
| 13 | Chicago | - | - | - | - | - | - | - | - | - | - | - | - | |
| 14 | Great Lakes-Emerson | $2.163 | $2.163 | $2.163 | $2.163 | $2.163 | $2.163 | $2.163 | $2.706 | $2.706 | $2.706 | $2.706 | $2.706 | |
| 15 | MichCon city-gate | $2.184 | $2.184 | $2.182 | $2.185 | $2.184 | $2.186 | $2.033 | $2.445 | $2.445 | $2.263 | $2.445 | $2.445 | |
| 16 | Panhandle Field Zone | $1.966 | $1.966 | $1.966 | $1.966 | $1.966 | $1.966 | $1.966 | $2.450 | $2.450 | $2.450 | $2.450 | $2.450 | |
| 17 | Vector-Alliance | - | - | - | - | - | - | - | - | - | - | - | - | |
| 18 | Viking-Emerson | $2.163 | $2.163 | $2.163 | $2.163 | $2.163 | $2.163 | $2.163 | $2.706 | $2.706 | $2.706 | $2.706 | $2.706 | |
| 19 | Nexus - Clarington | $2.027 | $2.027 | $2.027 | $2.027 | $2.027 | $2.030 | $2.027 | $2.505 | $2.505 | $2.505 | $2.505 | $2.505 | |
| 20 | ANR ML-3 | - | - | - | - | - | - | - | $2.553 | $2.553 | $2.553 | $2.553 | $2.553 | - |
| 20 | | | | | | | | | | | | | | |
| 21 | Index Price Comparison ($/Dth): | | | | | | | | | | | | | |
| 22 | ANR Southwest Field | $1.190 | $1.620 | $1.510 | $1.430 | $1.700 | $2.220 | $1.890 | $2.860 | $2.530 | $2.630 | $2.940 | $2.940 | |
| 23 | Chicago | $1.460 | $1.820 | $1.600 | $1.540 | $1.750 | $2.320 | $1.990 | $2.890 | $2.570 | $2.330 | $2.600 | $2.910 | |
| 24 | Great Lakes-Emerson | $1.440 | $1.740 | $1.600 | $1.610 | $1.715 | $2.246 | $2.347 | $3.545 | $2.600 | $2.310 | $2.650 | $2.770 | |
| 25 | MichCon city-gate | $1.480 | $1.780 | $1.600 | $1.440 | $1.700 | $2.200 | $1.820 | $2.680 | $2.610 | $2.300 | $2.590 | $2.730 | |
| 26 | Panhandle Field Zone | $1.070 | $1.540 | $1.320 | $1.323 | $1.610 | $2.200 | $1.780 | $2.690 | $2.570 | $2.290 | $2.820 | $2.820 | |
| 27 | Vector-Alliance | $1.460 | $1.820 | $1.600 | $1.540 | $1.750 | $2.320 | $1.990 | $2.890 | $2.570 | $2.330 | $2.600 | $2.910 | |
| 28 | Viking-Emerson | $1.440 | $1.740 | $1.600 | $1.610 | $1.715 | $2.246 | $2.347 | $3.545 | $2.600 | $2.310 | $2.650 | $2.770 | |
| 29 | Nexus - Clarington | $1.170 | $1.420 | $1.240 | $1.120 | $1.180 | $1.000 | $0.650 | $1.570 | $1.600 | $1.930 | $2.390 | $2.300 | |
| 30 | ANR ML-3 | $1.410 | $1.690 | $1.560 | $1.390 | $1.710 | $2.310 | $1.820 | $2.690 | $2.580 | $2.290 | $2.660 | $2.750 | |
| 31 | | | | | | | | | | | | | | |
| 32 | Difference between Fixed Price and Index ($/Dth): | | | | | | | | | | | | | |
| 33 | ANR Southwest Field | $0.966 | $0.536 | $0.646 | $0.726 | $0.456 | ($0.064) | $0.269 | ($0.414) | ($0.084) | ($0.184) | ($0.493) | ($0.494) | |
| 34 | Chicago | - | - | - | - | - | - | - | - | - | - | - | - | |
| 35 | Great Lakes-Emerson | $0.723 | $0.423 | $0.563 | $0.553 | $0.448 | ($0.083) | ($0.184) | ($0.839) | $0.106 | $0.396 | $0.056 | ($0.064) | |
| 36 | MichCon city-gate | $0.704 | $0.404 | $0.582 | $0.745 | $0.484 | ($0.014) | $0.213 | ($0.235) | ($0.165) | ($0.037) | ($0.145) | ($0.285) | |
| 37 | Panhandle Field Zone | $0.896 | $0.426 | $0.646 | $0.643 | $0.356 | ($0.234) | $0.186 | ($0.240) | ($0.120) | $0.160 | ($0.370) | ($0.370) | |
| 38 | Vector-Alliance | - | - | - | - | - | - | - | - | - | - | - | - | |
| 39 | Viking-Emerson | $0.723 | $0.423 | $0.563 | $0.553 | $0.448 | ($0.083) | ($0.184) | ($0.839) | $0.106 | $0.396 | $0.056 | ($0.064) | |
| 40 | Nexus - Clarington | $0.857 | $0.607 | $0.787 | $0.907 | $0.847 | $1.030 | $1.377 | $0.935 | $0.905 | $0.575 | $0.115 | $0.205 | |
| 41 | ANR ML-3 | - | - | - | - | - | - | - | ($0.137) | ($0.027) | $0.263 | ($0.107) | ($0.197) | |
| 42 | | | | | | | | | | | | | | |
| 43 | Cost of Fixed Price Gas Compared to Index ($): | | | | | | | | | | | | | |
| 44 | ANR Southwest Field | $2,311,815 | $1,328,639 | $1,549,470 | $1,799,271 | $1,130,508 | ($152,380) | $433,814 | ($999,600) | ($210,521) | ($459,761) | ($1,079,224) | ($1,232,405) | $4,419,627 |
| 45 | Chicago | - | - | - | - | - | - | - | - | - | - | - | - | $0 |
| 46 | Great Lakes-Emerson | $618,480 | $374,046 | $481,680 | $488,901 | $389,256 | ($70,899) | ($162,150) | ($696,889) | $90,923 | $339,946 | $43,344 | ($55,056) | $1,841,582 |
| 47 | MichCon city-gate | $2,052,213 | $1,216,660 | $1,733,658 | $2,250,605 | $1,466,546 | ($40,401) | $16,948 | ($11,985) | ($8,696) | ($2,834) | ($6,902) | ($15,020) | $8,650,793 |
| 48 | Panhandle Field Zone | $1,768,695 | $868,946 | $1,275,195 | $1,311,582 | $726,160 | ($461,925) | $379,394 | ($482,093) | ($248,922) | $332,638 | ($690,152) | ($768,172) | $4,011,345 |
| 49 | Vector-Alliance | - | - | - | - | - | - | - | - | - | - | - | - | $0 |
| 50 | Viking-Emerson | $455,722 | $275,613 | $319,430 | $360,243 | $291,747 | ($52,282) | ($104,840) | ($478,011) | $62,366 | $233,176 | $29,731 | ($32,274) | $1,360,622 |
| 51 | Nexus - Clarington | $976,530 | $714,581 | $896,730 | $1,032,617 | $997,301 | $1,159,450 | $1,621,641 | $1,035,498 | $1,035,698 | $658,211 | $119,241 | $234,968 | $10,482,465 |
| 52 | ANR ML-3 | - | - | - | - | - | - | - | ($38,955) | ($7,859) | $77,547 | ($28,255) | ($57,924) | ($55,445) |
| 53 | Total | $ 8,183,455 | $ 4,778,484 | $ 6,256,163 | $ 7,243,219 | $ 5,001,518 | $ 381,563 | $ 2,184,807 | $ (1,672,034) | $ 712,989 | $ 1,178,922 | $ (1,612,217) | $ (1,925,882) | $ 30,710,988 |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | | April-20 | | | May-20 | | | June-20 | | | July-20 | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | MCN | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | |
| 1 | **ANR ML-3** | | | | | | | | | | | | |
| 2 | **SPOT-Indexed Price** | | | | | | | | | | | | |
| 3 | AN | | | | | | | | | | | | |
| 4 | 8728225 | | | | | | | | | | | | |
| 5 | AW | | | | | | | | | | | | |
| 6 | 8622867 | | | | | | | | | | | | |
| 7 | 8725829 | | | | | | | | | | | | |
| 8 | F | | | | | | | | | | | | |
| 9 | 8622733 | | | | | | | | | | | | |
| 10 | M | | | | | | | | | | | | |
| 11 | 8622755 | | | | | | | | | | | | |
| 12 | 8725852 | | | | | | | | | | | | |
| 13 | BE | | | | | | | | | | | | |
| 14 | 8623043 | | | | | | | | | | | | |
| 15 | 8671322 | | | | | | | | | | | | |
| 16 | 8726089 | | | | | | | | | | | | |
| 17 | **TERM-Fixed Price** | | | | | | | | | | | | |
| 18 | C | | | | | | | | | | | | |
| 19 | 7924582 | | | | | | | | | | | | |
| 20 | Q | | | | | | | | | | | | |
| 21 | 7871447 | | | | | | | | | | | | |
| 22 | **ANR Southwest Field** | **2,428,032** | **5,201,353** | **2.075** | **2,514,065** | **5,402,447** | **2.110** | **2,397,000** | **5,168,940** | **2.148** | **2,514,100** | **5,395,178** | **2.095** |
| 23 | **SPOT-Indexed Price** | **36,000** | **43,020** | **1.195** | **37,200** | **61,287** | **1.648** | | | | **37,200** | **53,940** | **1.450** |
| 24 | C | 36,000 | 43,020 | 1.195 | 37,200 | 61,287 | 1.648 | | | | 37,200 | 53,940 | 1.450 |
| 25 | 8152703 | 36,000 | 43,020 | 1.195 | | | | | | | | | |
| 26 | 8206705 | | | | 37,200 | 61,287 | 1.648 | | | | | | |
| 27 | 8305348 | | | | | | | | | | 37,200 | 53,940 | 1.450 |
| 28 | F | | | | | | | | | | | | |
| 29 | 8624731 | | | | | | | | | | | | |
| 30 | **TERM-Fixed Price** | **2,392,032** | **5,158,333** | **2.148** | **2,476,865** | **5,341,160** | **2.148** | **2,397,000** | **5,168,940** | **2.148** | **2,476,900** | **5,341,238** | **2.148** |
| 31 | AW | 141,000 | 301,740 | 2.140 | 145,700 | 311,798 | 2.140 | 141,000 | 301,740 | 2.140 | 145,700 | 311,798 | 2.140 |
| 32 | 7669731 | 141,000 | 301,740 | 2.140 | 145,700 | 311,798 | 2.140 | 141,000 | 301,740 | 2.140 | 145,700 | 311,798 | 2.140 |
| 33 | C | 150,000 | 336,000 | 2.240 | 155,000 | 347,200 | 2.240 | 150,000 | 336,000 | 2.240 | 155,000 | 347,200 | 2.240 |
| 34 | 6763281 | | | | | | | | | | | | |
| 35 | 7306815 | | | | | | | | | | | | |
| 36 | 7557706 | 150,000 | 336,000 | 2.240 | 155,000 | 347,200 | 2.240 | 150,000 | 336,000 | 2.240 | 155,000 | 347,200 | 2.240 |
| 37 | E | 393,000 | 852,810 | 2.170 | 406,100 | 881,237 | 2.170 | 393,000 | 852,810 | 2.170 | 406,100 | 881,237 | 2.170 |
| 38 | 7613893 | 393,000 | 852,810 | 2.170 | 406,100 | 881,237 | 2.170 | 393,000 | 852,810 | 2.170 | 406,100 | 881,237 | 2.170 |
| 39 | 7813455 | | | | | | | | | | | | |
| 40 | F | 219,000 | 487,350 | 2.235 | 226,265 | 503,517 | 2.235 | 219,000 | 487,350 | 2.235 | 226,300 | 503,595 | 2.235 |
| 41 | 7032215 | | | | | | | | | | | | |
| 42 | 7306819 | | | | | | | | | | | | |
| 43 | 7361582 | | | | | | | | | | | | |
| 44 | 7513758 | 180,000 | 399,600 | 2.220 | 185,968 | 412,849 | 2.220 | 180,000 | 399,600 | 2.220 | 186,000 | 412,920 | 2.220 |
| 45 | 7617394 | 39,000 | 87,750 | 2.250 | 40,297 | 90,668 | 2.250 | 39,000 | 87,750 | 2.250 | 40,300 | 90,675 | 2.250 |
| 46 | 7859591 | | | | | | | | | | | | |
| 47 | M | 426,000 | 917,160 | 2.108 | 440,200 | 947,732 | 2.108 | 426,000 | 917,160 | 2.108 | 440,200 | 947,732 | 2.108 |
| 48 | 6977914 | 84,000 | 158,340 | 1.885 | 86,800 | 163,618 | 1.885 | 84,000 | 158,340 | 1.885 | 86,800 | 163,618 | 1.885 |
| 49 | 7251716 | | | | | | | | | | | | |
| 50 | 7515773 | 192,000 | 424,320 | 2.210 | 198,400 | 438,464 | 2.210 | 192,000 | 424,320 | 2.210 | 198,400 | 438,464 | 2.210 |
| 51 | 7557664 | 150,000 | 334,500 | 2.230 | 155,000 | 345,650 | 2.230 | 150,000 | 334,500 | 2.230 | 155,000 | 345,650 | 2.230 |
| 52 | 7813454 | | | | | | | | | | | | |
| 53 | O | 588,000 | 1,264,380 | 2.125 | 607,600 | 1,306,526 | 2.125 | 588,000 | 1,264,380 | 2.125 | 607,600 | 1,306,526 | 2.125 |
| 54 | 6763135 | 387,000 | 853,335 | 2.205 | 399,900 | 881,780 | 2.205 | 387,000 | 853,335 | 2.205 | 399,900 | 881,780 | 2.205 |
| 55 | 7240476 | 201,000 | 411,045 | 2.045 | 207,700 | 424,747 | 2.045 | 201,000 | 411,045 | 2.045 | 207,700 | 424,747 | 2.045 |
| 56 | 7672492 | | | | | | | | | | | | |
| 57 | Y | 180,000 | 369,000 | 2.050 | 186,000 | 381,300 | 2.050 | 180,000 | 369,000 | 2.050 | 186,000 | 381,300 | 2.050 |
| 58 | 7240473 | 180,000 | 369,000 | 2.050 | 186,000 | 381,300 | 2.050 | 180,000 | 369,000 | 2.050 | 186,000 | 381,300 | 2.050 |
| 59 | BE | 295,032 | 629,893 | 2.135 | 310,000 | 661,850 | 2.135 | 300,000 | 640,500 | 2.135 | 310,000 | 661,850 | 2.135 |
| 60 | 7667897 | 295,032 | 629,893 | 2.135 | 310,000 | 661,850 | 2.135 | 300,000 | 640,500 | 2.135 | 310,000 | 661,850 | 2.135 |
| 61 | **Chicago** | **1,317,600** | **1,917,696** | **1.458** | **1,170,870** | **2,105,241** | **1.798** | | | | | | |
| 62 | **SPOT-Indexed Price** | **1,317,600** | **1,917,696** | **1.458** | **1,170,870** | **2,105,241** | **1.798** | | | | | | |
| 63 | AQ | 150,000 | 219,000 | 1.460 | 310,000 | 556,450 | 1.795 | | | | | | |
| 64 | 8156014 | 150,000 | 219,000 | 1.460 | | | | | | | | | |
| 65 | 8207799 | | | | 310,000 | 556,450 | 1.795 | | | | | | |
| 66 | C | 267,600 | 390,696 | 1.460 | | | | | | | | | |
| 67 | 8156004 | 267,600 | 390,696 | 1.460 | | | | | | | | | |
| 68 | F | 300,000 | 438,000 | 1.460 | 310,000 | 556,450 | 1.795 | | | | | | |
| 69 | 8155997 | 300,000 | 438,000 | 1.460 | | | | | | | | | |
| 70 | 8207795 | | | | 310,000 | 556,450 | 1.795 | | | | | | |
| 71 | 8624728 | | | | | | | | | | | | |
| 72 | 8725096 | | | | | | | | | | | | |
| 73 | M | 600,000 | 870,000 | 1.450 | 310,000 | 558,775 | 1.803 | | | | | | |
| 74 | 8155762 | 600,000 | 870,000 | 1.450 | | | | | | | | | |
| 75 | 8206713 | | | | 310,000 | 558,775 | 1.803 | | | | | | |
| 76 | 8725100 | | | | | | | | | | | | |
| 77 | Y | | | | | | | | | | | | |
| 78 | 8728241 | | | | | | | | | | | | |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | April-20 | | | May-20 | | | June-20 | | | July-20 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | MCN | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | |
| 79 | Q | | | | 240,870 | 433,566 | 1.800 | | | | | | |
| 80 | 8208764 | | | | 240,870 | 433,566 | 1.800 | | | | | | |
| 81 | **Great Lakes-Emerson** | **912,900** | **1,958,075** | **2.115** | **946,275** | **2,027,689** | **2.112** | **855,000** | **1,849,680** | **2.176** | **952,630** | **2,023,486** | **2.065** |
| 82 | **SPOT-Indexed Price** | **57,900** | **108,395** | **1.872** | **62,775** | **116,353** | **1.854** | | | | **69,130** | **112,150** | **1.622** |
| 83 | AQ | 57,900 | 108,395 | 1.872 | 62,775 | 116,353 | 1.854 | | | | 69,130 | 112,150 | 1.622 |
| 84 | 8152338 | 57,900 | 108,395 | 1.872 | | | | | | | | | |
| 85 | 8204509 | | | | 62,775 | 116,353 | 1.854 | | | | | | |
| 86 | 8305280 | | | | | | | | | | 69,130 | 112,150 | 1.622 |
| 87 | 8521563 | | | | | | | | | | | | |
| 88 | 8574151 | | | | | | | | | | | | |
| 89 | 8622880 | | | | | | | | | | | | |
| 90 | 8671375 | | | | | | | | | | | | |
| 91 | 8726088 | | | | | | | | | | | | |
| 92 | **TERM-Fixed Price** | **855,000** | **1,849,680** | **2.176** | **883,500** | **1,911,336** | **2.176** | **855,000** | **1,849,680** | **2.176** | **883,500** | **1,911,336** | **2.176** |
| 93 | AQ | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 |
| 94 | 6934522 | | | | | | | | | | | | |
| 95 | 7201081 | | | | | | | | | | | | |
| 96 | 7463583 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 |
| 97 | 8470359 | | | | | | | | | | | | |
| 98 | AW | 387,000 | 832,050 | 2.150 | 399,900 | 859,785 | 2.150 | 387,000 | 832,050 | 2.150 | 399,900 | 859,785 | 2.150 |
| 99 | 6933935 | 387,000 | 832,050 | 2.150 | 399,900 | 859,785 | 2.150 | 387,000 | 832,050 | 2.150 | 399,900 | 859,785 | 2.150 |
| 100 | C | 279,000 | 609,390 | 2.198 | 288,300 | 629,703 | 2.198 | 279,000 | 609,390 | 2.198 | 288,300 | 629,703 | 2.198 |
| 101 | 7463672 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 |
| 102 | 7561731 | 90,000 | 201,150 | 2.235 | 93,000 | 207,855 | 2.235 | 90,000 | 201,150 | 2.235 | 93,000 | 207,855 | 2.235 |
| 103 | I | | | | | | | | | | | | |
| 104 | 7093249 | | | | | | | | | | | | |
| 105 | **MichCon city-gate** | **2,916,000** | **6,367,893** | **2.186** | **4,408,200** | **9,077,981** | **2.103** | **4,219,050** | **8,480,288** | **2.072** | **4,437,041** | **8,639,944** | **2.071** |
| 106 | **SPOT-Indexed Price** | | | | **1,395,000** | **2,497,825** | **1.791** | **1,240,050** | **1,980,230** | **1.597** | **1,414,685** | **2,037,146** | **1.440** |
| 107 | AN | | | | | | | | | | 310,000 | 446,400 | 1.440 |
| 108 | 8305590 | | | | | | | | | | 310,000 | 446,400 | 1.440 |
| 109 | 8359626 | | | | | | | | | | | | |
| 110 | 8363976 | | | | | | | | | | | | |
| 111 | 8413398 | | | | | | | | | | | | |
| 112 | 8472985 | | | | | | | | | | | | |
| 113 | 8522763 | | | | | | | | | | | | |
| 114 | AQ | | | | 155,000 | 278,225 | 1.795 | 190,050 | 303,605 | 1.598 | | | |
| 115 | 8204511 | | | | 155,000 | 278,225 | 1.795 | | | | | | |
| 116 | 8254334 | | | | | | | 190,050 | 303,605 | 1.598 | | | |
| 117 | 8364634 | | | | | | | | | | | | |
| 118 | 8472930 | | | | | | | | | | | | |
| 119 | 8521549 | | | | | | | | | | | | |
| 120 | 8800788 | | | | | | | | | | | | |
| 121 | AW | | | | | | | | | | | | |
| 122 | 8578034 | | | | | | | | | | | | |
| 123 | C | | | | 310,000 | 554,900 | 1.790 | | | | | | |
| 124 | 8206709 | | | | 310,000 | 554,900 | 1.790 | | | | | | |
| 125 | 8363998 | | | | | | | | | | | | |
| 126 | 8413384 | | | | | | | | | | | | |
| 127 | 8471085 | | | | | | | | | | | | |
| 128 | 8521564 | | | | | | | | | | | | |
| 129 | E | | | | 620,000 | 1,109,800 | 1.790 | 300,000 | 479,250 | 1.598 | | | |
| 130 | 8206698 | | | | 620,000 | 1,109,800 | 1.790 | | | | | | |
| 131 | 8254112 | | | | | | | 300,000 | 479,250 | 1.598 | | | |
| 132 | F | | | | 310,000 | 554,900 | 1.790 | 450,000 | 718,875 | 1.598 | 465,000 | 669,600 | 1.440 |
| 133 | 8206703 | | | | 310,000 | 554,900 | 1.790 | | | | | | |
| 134 | 8254117 | | | | | | | 450,000 | 718,875 | 1.598 | | | |
| 135 | 8304131 | | | | | | | | | | 465,000 | 669,600 | 1.440 |
| 136 | 8359630 | | | | | | | | | | | | |
| 137 | 8364806 | | | | | | | | | | | | |
| 138 | 8413380 | | | | | | | | | | | | |
| 139 | 8421650 | | | | | | | | | | | | |
| 140 | 8470571 | | | | | | | | | | | | |
| 141 | 8522755 | | | | | | | | | | | | |
| 142 | 8574091 | | | | | | | | | | | | |
| 143 | M | | | | | | | | | | | | |
| 144 | 8472943 | | | | | | | | | | | | |
| 145 | 8578022 | | | | | | | | | | | | |
| 146 | Y | | | | | | | | | | | | |
| 147 | 8471083 | | | | | | | | | | | | |
| 148 | AY | | | | | | | 300,000 | 478,500 | 1.595 | | | |
| 149 | 8254330 | | | | | | | 300,000 | 478,500 | 1.595 | | | |
| 150 | BE | | | | | | | | | | 310,000 | 446,400 | 1.440 |
| 151 | 8305780 | | | | | | | | | | 310,000 | 446,400 | 1.440 |
| 152 | 8413413 | | | | | | | | | | | | |
| 153 | 8471087 | | | | | | | | | | | | |
| 154 | 8521541 | | | | | | | | | | | | |
| 155 | 8574092 | | | | | | | | | | | | |
| 156 | W | | | | | | | | | | 329,685 | 474,746 | 1.440 |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | April-20 | | | May-20 | | | June-20 | | | July-20 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | MCN | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | |
| 157 | 8305784 | | | | | | | | | | 329,685 | 474,746 | 1.440 |
| 158 | **TERM-Fixed Price** | **2,916,000** | **6,367,893** | **2.186** | **3,013,200** | **6,580,156** | **2.186** | **2,916,000** | **6,367,893** | **2.186** | **3,022,356** | **6,602,798** | **2.220** |
| 159 | AQ | 300,000 | 630,000 | 2.100 | 310,000 | 651,000 | 2.100 | 300,000 | 630,000 | 2.100 | 310,000 | 651,000 | 2.100 |
| 160 | 7869493 | 300,000 | 630,000 | 2.100 | 310,000 | 651,000 | 2.100 | 300,000 | 630,000 | 2.100 | 310,000 | 651,000 | 2.100 |
| 161 | 8544534 | | | | | | | | | | | | |
| 162 | AW | 450,000 | 994,500 | 2.228 | 465,000 | 1,027,650 | 2.228 | 450,000 | 994,500 | 2.228 | 465,000 | 1,027,650 | 2.228 |
| 163 | 7715322 | 150,000 | 342,000 | 2.280 | 155,000 | 353,400 | 2.280 | 150,000 | 342,000 | 2.280 | 155,000 | 353,400 | 2.280 |
| 164 | 7761428 | 300,000 | 652,500 | 2.175 | 310,000 | 674,250 | 2.175 | 300,000 | 652,500 | 2.175 | 310,000 | 674,250 | 2.175 |
| 165 | 8456674 | | | | | | | | | | | | |
| 166 | C | | | | | | | | | | 9,156 | 22,642 | 2.473 |
| 167 | 8372658 | | | | | | | | | | 4,643 | 11,608 | 2.500 |
| 168 | 8372692 | | | | | | | | | | 4,513 | 11,034 | 2.445 |
| 169 | 8456091 | | | | | | | | | | | | |
| 170 | 8456125 | | | | | | | | | | | | |
| 171 | 8456187 | | | | | | | | | | | | |
| 172 | 8456210 | | | | | | | | | | | | |
| 173 | 8456274 | | | | | | | | | | | | |
| 174 | 8456298 | | | | | | | | | | | | |
| 175 | 8486091 | | | | | | | | | | | | |
| 176 | 8486094 | | | | | | | | | | | | |
| 177 | 8486106 | | | | | | | | | | | | |
| 178 | 8486109 | | | | | | | | | | | | |
| 179 | 8486110 | | | | | | | | | | | | |
| 180 | 8544518 | | | | | | | | | | | | |
| 181 | E | 150,000 | 329,250 | 2.195 | 155,000 | 340,225 | 2.195 | 150,000 | 329,250 | 2.195 | 155,000 | 340,225 | 2.195 |
| 182 | 7813016 | 150,000 | 329,250 | 2.195 | 155,000 | 340,225 | 2.195 | 150,000 | 329,250 | 2.195 | 155,000 | 340,225 | 2.195 |
| 183 | 7969442 | | | | | | | | | | | | |
| 184 | F | 612,000 | 1,379,550 | 2.248 | 632,400 | 1,425,535 | 2.248 | 612,000 | 1,379,550 | 2.248 | 632,400 | 1,425,535 | 2.248 |
| 185 | 7715347 | 162,000 | 368,550 | 2.275 | 167,400 | 380,835 | 2.275 | 162,000 | 368,550 | 2.275 | 167,400 | 380,835 | 2.275 |
| 186 | 7813025 | 150,000 | 330,000 | 2.200 | 155,000 | 341,000 | 2.200 | 150,000 | 330,000 | 2.200 | 155,000 | 341,000 | 2.200 |
| 187 | 7921193 | 300,000 | 681,000 | 2.270 | 310,000 | 703,700 | 2.270 | 300,000 | 681,000 | 2.270 | 310,000 | 703,700 | 2.270 |
| 188 | O | 243,000 | 507,870 | 2.090 | 251,100 | 524,799 | 2.090 | 243,000 | 507,870 | 2.090 | 251,100 | 524,799 | 2.090 |
| 189 | 7967163 | 243,000 | 507,870 | 2.090 | 251,100 | 524,799 | 2.090 | 243,000 | 507,870 | 2.090 | 251,100 | 524,799 | 2.090 |
| 190 | Q | 372,000 | 831,180 | 2.230 | 384,400 | 858,886 | 2.230 | 372,000 | 831,180 | 2.230 | 384,400 | 858,886 | 2.230 |
| 191 | 7813026 | 159,000 | 349,800 | 2.200 | 164,300 | 361,460 | 2.200 | 159,000 | 349,800 | 2.200 | 164,300 | 361,460 | 2.200 |
| 192 | 7921199 | 213,000 | 481,380 | 2.260 | 220,100 | 497,426 | 2.260 | 213,000 | 481,380 | 2.260 | 220,100 | 497,426 | 2.260 |
| 193 | R | 312,000 | 695,220 | 2.230 | 322,400 | 718,394 | 2.230 | 312,000 | 695,220 | 2.230 | 322,400 | 718,394 | 2.230 |
| 194 | 7715335 | 150,000 | 341,250 | 2.275 | 155,000 | 352,625 | 2.275 | 150,000 | 341,250 | 2.275 | 155,000 | 352,625 | 2.275 |
| 195 | 7761447 | 162,000 | 353,970 | 2.185 | 167,400 | 365,769 | 2.185 | 162,000 | 353,970 | 2.185 | 167,400 | 365,769 | 2.185 |
| 196 | BC | 327,000 | 686,073 | 2.098 | 337,900 | 708,942 | 2.098 | 327,000 | 686,073 | 2.098 | 337,900 | 708,942 | 2.098 |
| 197 | 7871365 | 177,000 | 371,523 | 2.099 | 182,900 | 383,907 | 2.099 | 177,000 | 371,523 | 2.099 | 182,900 | 383,907 | 2.099 |
| 198 | 7967147 | 150,000 | 314,550 | 2.097 | 155,000 | 325,035 | 2.097 | 150,000 | 314,550 | 2.097 | 155,000 | 325,035 | 2.097 |
| 199 | BF | 150,000 | 314,250 | 2.095 | 155,000 | 324,725 | 2.095 | 150,000 | 314,250 | 2.095 | 155,000 | 324,725 | 2.095 |
| 200 | 7871451 | 150,000 | 314,250 | 2.095 | 155,000 | 324,725 | 2.095 | 150,000 | 314,250 | 2.095 | 155,000 | 324,725 | 2.095 |
| 201 | **SPOT-Fixed Price** | | | | | | | **63,000** | **132,165** | **2.103** | | | |
| 202 | AQ | | | | | | | 38,400 | 79,808 | 2.078 | | | |
| 203 | 8319272 | | | | | | | 12,800 | 27,008 | 2.110 | | | |
| 204 | 8319284 | | | | | | | 12,800 | 26,496 | 2.070 | | | |
| 205 | 8319288 | | | | | | | 12,800 | 26,304 | 2.055 | | | |
| 206 | C | | | | | | | 24,600 | 52,357 | 2.128 | | | |
| 207 | 8319171 | | | | | | | 8,200 | 17,712 | 2.160 | | | |
| 208 | 8319175 | | | | | | | 8,200 | 17,384 | 2.120 | | | |
| 209 | 8319181 | | | | | | | 8,200 | 17,261 | 2.105 | | | |
| 210 | 8511758 | | | | | | | | | | | | |
| 211 | AA | | | | | | | | | | | | |
| 212 | 8659557 | | | | | | | | | | | | |
| 213 | **NEXUS - Clarington** | **1,890,000** | **2,960,055** | **1.768** | **790,500** | **1,595,586** | **1.855** | **765,000** | **1,543,035** | **1.795** | **763,467** | **1,539,164** | **1.752** |
| 214 | **SPOT-Indexed Price** | **1,131,000** | **1,425,060** | **1.260** | **6,200** | **9,424** | **1.520** | **6,000** | **8,040** | **1.340** | **5,988** | **7,245** | **1.210** |
| 215 | AX | 1,131,000 | 1,425,060 | 1.260 | 6,200 | 9,424 | 1.520 | 6,000 | 8,040 | 1.340 | 5,988 | 7,245 | 1.210 |
| 216 | 8152770 | 1,131,000 | 1,425,060 | 1.260 | | | | | | | | | |
| 217 | 8207831 | | | | 6,200 | 9,424 | 1.520 | | | | | | |
| 218 | 8254115 | | | | | | | 6,000 | 8,040 | 1.340 | | | |
| 219 | 8305567 | | | | | | | | | | 5,988 | 7,245 | 1.210 |
| 220 | 8579319 | | | | | | | | | | | | |
| 221 | 8726474 | | | | | | | | | | | | |
| 222 | **TERM-Fixed Price** | **759,000** | **1,534,995** | **2.023** | **784,300** | **1,586,162** | **2.023** | **759,000** | **1,534,995** | **2.023** | **757,479** | **1,531,919** | **2.023** |
| 223 | C | 381,000 | 760,095 | 1.995 | 393,700 | 785,432 | 1.995 | 381,000 | 760,095 | 1.995 | 380,236 | 758,571 | 1.995 |
| 224 | 7358446 | 381,000 | 760,095 | 1.995 | 393,700 | 785,432 | 1.995 | 381,000 | 760,095 | 1.995 | 380,236 | 758,571 | 1.995 |
| 225 | 7517361 | | | | | | | | | | | | |
| 226 | AX | 378,000 | 774,900 | 2.050 | 390,600 | 800,730 | 2.050 | 378,000 | 774,900 | 2.050 | 377,243 | 773,348 | 2.050 |
| 227 | 7406537 | 378,000 | 774,900 | 2.050 | 390,600 | 800,730 | 2.050 | 378,000 | 774,900 | 2.050 | 377,243 | 773,348 | 2.050 |
| 228 | 7466208 | | | | | | | | | | | | |
| 229 | 7557647 | | | | | | | | | | | | |
| 230 | 7672566 | | | | | | | | | | | | |
| 231 | **NEXUS - Kensington** | | | | **620,000** | **1,027,185** | **1.680** | **1,138,500** | **1,774,452** | **1.557** | **1,146,871** | **1,501,221** | **1.313** |
| 232 | **SPOT-Indexed Price** | | | | **620,000** | **1,027,185** | **1.680** | **1,138,500** | **1,774,452** | **1.557** | **1,146,871** | **1,501,221** | **1.313** |
| 233 | C | | | | 155,000 | 267,375 | 1.725 | | | | | | |
| 234 | 8208775 | | | | 155,000 | 267,375 | 1.725 | | | | | | |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | April-20 | | | May-20 | | | June-20 | | | July-20 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | MCN | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | |
| 235 | Z | | | | 465,000 | 759,810 | 1.634 | 388,500 | 602,952 | 1.552 | 303,596 | 400,747 | 1.320 |
| 236 | 8204482 | | | | 465,000 | 759,810 | 1.634 | | | | | | |
| 237 | 8254108 | | | | | | | 388,500 | 602,952 | 1.552 | | | |
| 238 | 8305589 | | | | | | | | | | 303,596 | 400,747 | 1.320 |
| 239 | BD | | | | | | | 750,000 | 1,171,500 | 1.562 | 843,275 | 1,100,474 | 1.305 |
| 240 | 8254106 | | | | | | | 750,000 | 1,171,500 | 1.562 | | | |
| 241 | 8304136 | | | | | | | | | | 843,275 | 1,100,474 | 1.305 |
| 242 | 8361380 | | | | | | | | | | | | |
| 243 | 8417206 | | | | | | | | | | | | |
| 244 | 8470568 | | | | | | | | | | | | |
| 245 | 8620086 | | | | | | | | | | | | |
| 246 | **Panhandle Field Zone** | **2,042,700** | **3,954,482** | **1.808** | **2,110,790** | **4,120,804** | **1.931** | **2,042,700** | **3,982,723** | **1.923** | **2,110,790** | **4,105,009** | **1.908** |
| 247 | **SPOT-Indexed Price** | **68,700** | **73,607** | **1.071** | **70,990** | **110,567** | **1.558** | **68,700** | **101,848** | **1.483** | **70,990** | **94,772** | **1.335** |
| 248 | C | 68,700 | 73,607 | 1.071 | 70,990 | 110,567 | 1.558 | 68,700 | 101,848 | 1.483 | 70,990 | 94,772 | 1.335 |
| 249 | 8152700 | 29,700 | 31,779 | 1.070 | | | | | | | | | |
| 250 | 8157471 | 39,000 | 41,828 | 1.073 | | | | | | | | | |
| 251 | 8206704 | | | | 70,990 | 110,567 | 1.558 | | | | | | |
| 252 | 8254497 | | | | | | | 68,700 | 101,848 | 1.483 | | | |
| 253 | 8305325 | | | | | | | | | | 70,990 | 94,772 | 1.335 |
| 254 | F | | | | | | | | | | | | |
| 255 | 8624735 | | | | | | | | | | | | |
| 256 | **TERM-Fixed Price** | **1,974,000** | **3,880,875** | **1.972** | **2,039,800** | **4,010,238** | **1.972** | **1,974,000** | **3,880,875** | **1.972** | **2,039,800** | **4,010,238** | **1.972** |
| 257 | AW | 150,000 | 297,750 | 1.985 | 155,000 | 307,675 | 1.985 | 150,000 | 297,750 | 1.985 | 155,000 | 307,675 | 1.985 |
| 258 | 6822722 | 150,000 | 297,750 | 1.985 | 155,000 | 307,675 | 1.985 | 150,000 | 297,750 | 1.985 | 155,000 | 307,675 | 1.985 |
| 259 | 6872767 | | | | | | | | | | | | |
| 260 | C | 615,000 | 1,217,325 | 1.983 | 635,500 | 1,257,903 | 1.983 | 615,000 | 1,217,325 | 1.983 | 635,500 | 1,257,903 | 1.983 |
| 261 | 6822728 | 231,000 | 460,845 | 1.995 | 238,700 | 476,207 | 1.995 | 231,000 | 460,845 | 1.995 | 238,700 | 476,207 | 1.995 |
| 262 | 7137188 | 384,000 | 756,480 | 1.970 | 396,800 | 781,696 | 1.970 | 384,000 | 756,480 | 1.970 | 396,800 | 781,696 | 1.970 |
| 263 | 7200559 | | | | | | | | | | | | |
| 264 | 7718489 | | | | | | | | | | | | |
| 265 | 7765543 | | | | | | | | | | | | |
| 266 | E | | | | | | | | | | | | |
| 267 | 7765529 | | | | | | | | | | | | |
| 268 | F | 210,000 | 422,100 | 2.010 | 217,000 | 436,170 | 2.010 | 210,000 | 422,100 | 2.010 | 217,000 | 436,170 | 2.010 |
| 269 | 6824613 | | | | | | | | | | | | |
| 270 | 6872685 | 210,000 | 422,100 | 2.010 | 217,000 | 436,170 | 2.010 | 210,000 | 422,100 | 2.010 | 217,000 | 436,170 | 2.010 |
| 271 | 7718488 | | | | | | | | | | | | |
| 272 | M | 300,000 | 555,000 | 1.850 | 310,000 | 573,500 | 1.850 | 300,000 | 555,000 | 1.850 | 310,000 | 573,500 | 1.850 |
| 273 | 6874492 | | | | | | | | | | | | |
| 274 | 6973527 | 300,000 | 555,000 | 1.850 | 310,000 | 573,500 | 1.850 | 300,000 | 555,000 | 1.850 | 310,000 | 573,500 | 1.850 |
| 275 | 7417452 | | | | | | | | | | | | |
| 276 | 7765550 | | | | | | | | | | | | |
| 277 | O | | | | | | | | | | | | |
| 278 | 6824618 | | | | | | | | | | | | |
| 279 | 7615691 | | | | | | | | | | | | |
| 280 | I | 495,000 | 982,230 | 1.982 | 511,500 | 1,014,971 | 1.982 | 495,000 | 982,230 | 1.982 | 511,500 | 1,014,971 | 1.982 |
| 281 | 6872690 | 177,000 | 352,230 | 1.990 | 182,900 | 363,971 | 1.990 | 177,000 | 352,230 | 1.990 | 182,900 | 363,971 | 1.990 |
| 282 | 7090771 | 138,000 | 269,100 | 1.950 | 142,600 | 278,070 | 1.950 | 138,000 | 269,100 | 1.950 | 142,600 | 278,070 | 1.950 |
| 283 | 7191756 | 180,000 | 360,900 | 2.005 | 186,000 | 372,930 | 2.005 | 180,000 | 360,900 | 2.005 | 186,000 | 372,930 | 2.005 |
| 284 | Q | 204,000 | 406,470 | 1.993 | 210,800 | 420,019 | 1.993 | 204,000 | 406,470 | 1.993 | 210,800 | 420,019 | 1.993 |
| 285 | 7191751 | 204,000 | 406,470 | 1.993 | 210,800 | 420,019 | 1.993 | 204,000 | 406,470 | 1.993 | 210,800 | 420,019 | 1.993 |
| 286 | **Vector-Alliance** | **300,000** | **434,250** | **1.448** | | | | | | | | | |
| 287 | **SPOT-Indexed Price** | **300,000** | **434,250** | **1.448** | | | | | | | | | |
| 288 | E | | | | | | | | | | | | |
| 289 | 8725840 | | | | | | | | | | | | |
| 290 | F | 300,000 | 434,250 | 1.448 | | | | | | | | | |
| 291 | 8152783 | 300,000 | 434,250 | 1.448 | | | | | | | | | |
| 292 | **Viking-Emerson** | **632,100** | **1,276,231** | **1.974** | **653,170** | **1,318,732** | **1.968** | **567,000** | **1,145,070** | **2.025** | **653,325** | **1,318,505** | **1.894** |
| 293 | **SPOT-Indexed Price** | **2,100** | **3,931** | **1.872** | **2,170** | **4,022** | **1.854** | | | | **2,325** | **3,795** | **1.632** |
| 294 | AQ | 2,100 | 3,931 | 1.872 | 2,170 | 4,022 | 1.854 | | | | 2,325 | 3,795 | 1.632 |
| 295 | 8152333 | 2,100 | 3,931 | 1.872 | | | | | | | | | |
| 296 | 8204507 | | | | 2,170 | 4,022 | 1.854 | | | | | | |
| 297 | 8305250 | | | | | | | | | | 2,325 | 3,795 | 1.632 |
| 298 | 8521559 | | | | | | | | | | | | |
| 299 | 8574150 | | | | | | | | | | | | |
| 300 | 8622875 | | | | | | | | | | | | |
| 301 | 8671365 | | | | | | | | | | | | |
| 302 | 8726080 | | | | | | | | | | | | |
| 303 | **TERM-Fixed Price** | **630,000** | **1,272,300** | **2.025** | **651,000** | **1,314,710** | **2.025** | **567,000** | **1,145,070** | **2.025** | **651,000** | **1,314,710** | **2.025** |
| 304 | AQ | 384,000 | 768,000 | 2.000 | 396,800 | 793,600 | 2.000 | 345,600 | 691,200 | 2.000 | 396,800 | 793,600 | 2.000 |
| 305 | 7032205 | 384,000 | 768,000 | 2.000 | 396,800 | 793,600 | 2.000 | 345,600 | 691,200 | 2.000 | 396,800 | 793,600 | 2.000 |
| 306 | C | 246,000 | 504,300 | 2.050 | 254,200 | 521,110 | 2.050 | 221,400 | 453,870 | 2.050 | 254,200 | 521,110 | 2.050 |
| 307 | 7090772 | 246,000 | 504,300 | 2.050 | 254,200 | 521,110 | 2.050 | 221,400 | 453,870 | 2.050 | 254,200 | 521,110 | 2.050 |
| 308 | F | | | | | | | | | | | | |
| 309 | 6978102 | | | | | | | | | | | | |
| 310 | Y | | | | | | | | | | | | |
| 311 | 7147064 | | | | | | | | | | | | |
| 312 | **Grand Total** | **12,439,332** | **24,070,035** | **1.977** | **13,213,870** | **26,675,666** | **2.022** | **11,984,250** | **23,944,188** | **2.036** | **12,578,224** | **24,522,507** | **1.995** |

| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Receipt Point | April-20 | | | May-20 | | | June-20 | | | July-20 | | |
| (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| internal_portfolio | MCN | | | | | | | | | | | |
| (4) Deal Number | | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 Subtotal Index Price | | | | | | | | | | | | |
| 316 Plus Affiliate Spot Index from Exhibit A-7 | | | | | | | | | | | | |
| 317 Total Spot Index Price | | | | | | | | | | | | |
| 318 Total Fixed Price | | | | | | | | | | | | |
| 319 Grand Total | | | | | | | | | | | | |

| | (m) | (n) | (o) | (p) | (q) | (r) | (s) | (t) | (u) | (v) | (w) | (x) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Receipt Point | August-20 | | | September-20 | | | October-20 | | | November-20 | | |
| (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| internal_portfolio | | | | | | | | | | | | |
| (4) Deal Number | | | | | | | | | | | | |
| 1 **ANR ML-3** | | | | | | | | | | **285,000** | **727,695** | **2.550** |
| 2 **SPOT-Indexed Price** | | | | | | | | | | | | |
| 3 AN | | | | | | | | | | | | |
| 4 8728225 | | | | | | | | | | | | |
| 5 AW | | | | | | | | | | | | |
| 6 8622867 | | | | | | | | | | | | |
| 7 8725829 | | | | | | | | | | | | |
| 8 F | | | | | | | | | | | | |
| 9 8622733 | | | | | | | | | | | | |
| 10 M | | | | | | | | | | | | |
| 11 8622755 | | | | | | | | | | | | |
| 12 8725852 | | | | | | | | | | | | |
| 13 BE | | | | | | | | | | | | |
| 14 8623043 | | | | | | | | | | | | |
| 15 8671322 | | | | | | | | | | | | |
| 16 8726089 | | | | | | | | | | | | |
| 17 **TERM-Fixed Price** | | | | | | | | | | **285,000** | **727,695** | **2.550** |
| 18 C | | | | | | | | | | 156,000 | 403,260 | 2.585 |
| 19 7924582 | | | | | | | | | | 156,000 | 403,260 | 2.585 |
| 20 Q | | | | | | | | | | 129,000 | 324,435 | 2.515 |
| 21 7871447 | | | | | | | | | | 129,000 | 324,435 | 2.515 |
| 22 **ANR Southwest Field** | **2,476,900** | **5,341,238** | **2.148** | **2,396,713** | **5,168,323** | **2.148** | **1,615,100** | **3,486,353** | **2.148** | **2,411,750** | **5,898,005** | **2.440** |
| 23 **SPOT-Indexed Price** | | | | | | | | | | | | |
| 24 C | | | | | | | | | | | | |
| 25 8152703 | | | | | | | | | | | | |
| 26 8206705 | | | | | | | | | | | | |
| 27 8305348 | | | | | | | | | | | | |
| 28 F | | | | | | | | | | | | |
| 29 8624731 | | | | | | | | | | | | |
| 30 **TERM-Fixed Price** | **2,476,900** | **5,341,238** | **2.148** | **2,396,713** | **5,168,323** | **2.148** | **1,615,100** | **3,486,353** | **2.148** | **2,411,750** | **5,898,005** | **2.440** |
| 31 AW | 145,700 | 311,798 | 2.140 | 141,000 | 301,740 | 2.140 | | | | | | |
| 32 7669731 | 145,700 | 311,798 | 2.140 | 141,000 | 301,740 | 2.140 | | | | | | |
| 33 C | 155,000 | 347,200 | 2.240 | 150,000 | 336,000 | 2.240 | 155,000 | 347,200 | 2.240 | 456,000 | 1,187,025 | 2.573 |
| 34 6763281 | | | | | | | | | | 285,000 | 768,075 | 2.695 |
| 35 7306815 | | | | | | | | | | 171,000 | 418,950 | 2.450 |
| 36 7557706 | 155,000 | 347,200 | 2.240 | 150,000 | 336,000 | 2.240 | 155,000 | 347,200 | 2.240 | | | |
| 37 E | 406,100 | 881,237 | 2.170 | 393,000 | 852,810 | 2.170 | | | | 190,500 | 443,865 | 2.330 |
| 38 7613893 | 406,100 | 881,237 | 2.170 | 393,000 | 852,810 | 2.170 | | | | | | |
| 39 7813455 | | | | | | | | | | 190,500 | 443,865 | 2.330 |
| 40 F | 226,300 | 503,595 | 2.235 | 219,000 | 487,350 | 2.235 | 226,300 | 503,595 | 2.235 | 1,041,000 | 2,512,725 | 2.418 |
| 41 7032215 | | | | | | | | | | 273,000 | 656,565 | 2.405 |
| 42 7306819 | | | | | | | | | | 150,000 | 368,250 | 2.455 |
| 43 7361582 | | | | | | | | | | 318,000 | 793,410 | 2.495 |
| 44 7513758 | 186,000 | 412,920 | 2.220 | 180,000 | 399,600 | 2.220 | 186,000 | 412,920 | 2.220 | | | |
| 45 7617394 | 40,300 | 90,675 | 2.250 | 39,000 | 87,750 | 2.250 | 40,300 | 90,675 | 2.250 | | | |
| 46 7859591 | | | | | | | | | | 300,000 | 694,500 | 2.315 |
| 47 M | 440,200 | 947,732 | 2.108 | 426,000 | 917,160 | 2.108 | 440,200 | 947,732 | 2.108 | 508,500 | 1,215,015 | 2.378 |
| 48 6977914 | 86,800 | 163,618 | 1.885 | 84,000 | 158,340 | 1.885 | 86,800 | 163,618 | 1.885 | | | |
| 49 7251716 | | | | | | | | | | 318,000 | 771,150 | 2.425 |
| 50 7515773 | 198,400 | 438,464 | 2.210 | 192,000 | 424,320 | 2.210 | 198,400 | 438,464 | 2.210 | | | |
| 51 7557664 | 155,000 | 345,650 | 2.230 | 150,000 | 334,500 | 2.230 | 155,000 | 345,650 | 2.230 | | | |
| 52 7813454 | | | | | | | | | | 190,500 | 443,865 | 2.330 |
| 53 O | 607,600 | 1,306,526 | 2.125 | 587,713 | 1,263,763 | 2.125 | 607,600 | 1,306,526 | 2.125 | 215,750 | 539,375 | 2.500 |
| 54 6763135 | 399,900 | 881,780 | 2.205 | 386,812 | 852,920 | 2.205 | 399,900 | 881,780 | 2.205 | | | |
| 55 7240476 | 207,700 | 424,747 | 2.045 | 200,901 | 410,843 | 2.045 | 207,700 | 424,747 | 2.045 | | | |
| 56 7672492 | | | | | | | | | | 215,750 | 539,375 | 2.500 |
| 57 Y | 186,000 | 381,300 | 2.050 | 180,000 | 369,000 | 2.050 | 186,000 | 381,300 | 2.050 | | | |
| 58 7240473 | 186,000 | 381,300 | 2.050 | 180,000 | 369,000 | 2.050 | 186,000 | 381,300 | 2.050 | | | |
| 59 BE | 310,000 | 661,850 | 2.135 | 300,000 | 640,500 | 2.135 | | | | | | |
| 60 7667897 | 310,000 | 661,850 | 2.135 | 300,000 | 640,500 | 2.135 | | | | | | |
| 61 **Chicago** | | | | | | | | | | | | |
| 62 **SPOT-Indexed Price** | | | | | | | | | | | | |
| 63 AQ | | | | | | | | | | | | |
| 64 8156014 | | | | | | | | | | | | |
| 65 8207799 | | | | | | | | | | | | |
| 66 C | | | | | | | | | | | | |
| 67 8156004 | | | | | | | | | | | | |
| 68 F | | | | | | | | | | | | |
| 69 8155997 | | | | | | | | | | | | |
| 70 8207795 | | | | | | | | | | | | |
| 71 8624728 | | | | | | | | | | | | |
| 72 8725096 | | | | | | | | | | | | |
| 73 M | | | | | | | | | | | | |
| 74 8155762 | | | | | | | | | | | | |
| 75 8206713 | | | | | | | | | | | | |
| 76 8725100 | | | | | | | | | | | | |
| 77 Y | | | | | | | | | | | | |
| 78 8728241 | | | | | | | | | | | | |

| | | (m) | (n) | (o) | (p) | (q) | (r) | (s) | (t) | (u) | (v) | (w) | (x) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | August-20 | | | September-20 | | | October-20 | | | November-20 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | |
| 79 | Q | | | | | | | | | | | | |
| 80 | 8208764 | | | | | | | | | | | | |
| 81 | **Great Lakes-Emerson** | **868,580** | **1,879,131** | **2.206** | **854,343** | **1,848,212** | **2.176** | **883,500** | **1,911,336** | **2.176** | **917,099** | **2,497,701** | **2.756** |
| 82 | **SPOT-Indexed Price** | | | | | | | | | | **86,100** | **249,113** | **2.893** |
| 83 | AQ | | | | | | | | | | 86,100 | 249,113 | 2.893 |
| 84 | 8152338 | | | | | | | | | | | | |
| 85 | 8204509 | | | | | | | | | | | | |
| 86 | 8305280 | | | | | | | | | | | | |
| 87 | 8521563 | | | | | | | | | | 86,100 | 249,113 | 2.893 |
| 88 | 8574151 | | | | | | | | | | | | |
| 89 | 8622880 | | | | | | | | | | | | |
| 90 | 8671375 | | | | | | | | | | | | |
| 91 | 8726088 | | | | | | | | | | | | |
| 92 | **TERM-Fixed Price** | **868,580** | **1,879,131** | **2.206** | **854,343** | **1,848,212** | **2.176** | **883,500** | **1,911,336** | **2.176** | **830,999** | **2,248,587** | **2.710** |
| 93 | AQ | 195,218 | 422,181 | 2.243 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 | 522,000 | 1,440,555 | 2.758 |
| 94 | 6934522 | | | | | | | | | | 273,000 | 765,765 | 2.805 |
| 95 | 7201081 | | | | | | | | | | 249,000 | 674,790 | 2.710 |
| 96 | 7463583 | 192,125 | 414,990 | 2.160 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 | | | |
| 97 | 8470359 | 3,093 | 7,191 | 2.325 | | | | | | | | | |
| 98 | AW | 392,547 | 843,976 | 2.150 | 387,000 | 832,050 | 2.150 | 399,900 | 859,785 | 2.150 | | | |
| 99 | 6933935 | 392,547 | 843,976 | 2.150 | 387,000 | 832,050 | 2.150 | 399,900 | 859,785 | 2.150 | | | |
| 100 | C | 280,815 | 612,974 | 2.198 | 278,343 | 607,922 | 2.198 | 288,300 | 629,703 | 2.198 | | | |
| 101 | 7463672 | 195,300 | 421,848 | 2.160 | 189,000 | 408,240 | 2.160 | 195,300 | 421,848 | 2.160 | | | |
| 102 | 7561731 | 85,515 | 191,126 | 2.235 | 89,343 | 199,682 | 2.235 | 93,000 | 207,855 | 2.235 | | | |
| 103 | I | | | | | | | | | | 308,999 | 808,032 | 2.615 |
| 104 | 7093249 | | | | | | | | | | 308,999 | 808,032 | 2.615 |
| 105 | **MichCon city-gate** | **4,793,321** | **9,615,967** | **2.122** | **5,057,621** | **11,074,850** | **2.324** | **2,946,923** | **5,376,775** | **1.866** | **2,295,000** | **6,144,960** | **2.643** |
| 106 | **SPOT-Indexed Price** | **1,765,450** | **3,002,040** | **1.700** | **2,136,000** | **4,690,680** | **2.196** | **2,867,500** | **5,215,277** | **1.819** | **2,244,000** | **6,020,265** | **2.683** |
| 107 | AN | 775,000 | 1,317,500 | 1.700 | 450,000 | 988,875 | 2.198 | 508,400 | 925,288 | 1.820 | 600,000 | 1,611,000 | 2.685 |
| 108 | 8305590 | | | | | | | | | | | | |
| 109 | 8359626 | 465,000 | 790,500 | 1.700 | | | | | | | | | |
| 110 | 8363976 | 310,000 | 527,000 | 1.700 | | | | | | | | | |
| 111 | 8413398 | | | | 450,000 | 988,875 | 2.198 | | | | | | |
| 112 | 8472985 | | | | | | | 508,400 | 925,288 | 1.820 | | | |
| 113 | 8522763 | | | | | | | | | | 600,000 | 1,611,000 | 2.685 |
| 114 | AQ | 155,000 | 263,500 | 1.700 | | | | 310,000 | 563,425 | 1.818 | 300,000 | 804,000 | 2.680 |
| 115 | 8204511 | | | | | | | | | | | | |
| 116 | 8254334 | | | | | | | | | | | | |
| 117 | 8364634 | 155,000 | 263,500 | 1.700 | | | | | | | | | |
| 118 | 8472930 | | | | | | | 310,000 | 563,425 | 1.818 | | | |
| 119 | 8521549 | | | | | | | | | | 300,000 | 804,000 | 2.680 |
| 120 | 8800788 | | | | | | | | | | | | |
| 121 | AW | | | | | | | | | | | | |
| 122 | 8578034 | | | | | | | | | | | | |
| 123 | C | 310,000 | 527,775 | 1.703 | 450,000 | 988,875 | 2.198 | 310,000 | 564,200 | 1.820 | 294,000 | 789,390 | 2.685 |
| 124 | 8206709 | | | | | | | | | | | | |
| 125 | 8363998 | 310,000 | 527,775 | 1.703 | | | | | | | | | |
| 126 | 8413384 | | | | 450,000 | 988,875 | 2.198 | | | | | | |
| 127 | 8471085 | | | | | | | 310,000 | 564,200 | 1.820 | | | |
| 128 | 8521564 | | | | | | | | | | 294,000 | 789,390 | 2.685 |
| 129 | E | | | | | | | | | | | | |
| 130 | 8206698 | | | | | | | | | | | | |
| 131 | 8254112 | | | | | | | | | | | | |
| 132 | F | 525,450 | 893,265 | 1.700 | 636,000 | 1,395,930 | 2.194 | 620,000 | 1,126,850 | 1.818 | 600,000 | 1,611,000 | 2.685 |
| 133 | 8206703 | | | | | | | | | | | | |
| 134 | 8254117 | | | | | | | | | | | | |
| 135 | 8304131 | | | | | | | | | | | | |
| 136 | 8359630 | 465,000 | 790,500 | 1.700 | | | | | | | | | |
| 137 | 8364806 | 60,450 | 102,765 | 1.700 | | | | | | | | | |
| 138 | 8413380 | | | | 600,000 | 1,317,000 | 2.195 | | | | | | |
| 139 | 8421650 | | | | 36,000 | 78,930 | 2.193 | | | | | | |
| 140 | 8470571 | | | | | | | 620,000 | 1,126,850 | 1.818 | | | |
| 141 | 8522755 | | | | | | | | | | 600,000 | 1,611,000 | 2.685 |
| 142 | 8574091 | | | | | | | | | | | | |
| 143 | M | | | | | | | 499,100 | 907,114 | 1.818 | | | |
| 144 | 8472943 | | | | | | | 499,100 | 907,114 | 1.818 | | | |
| 145 | 8578022 | | | | | | | | | | | | |
| 146 | Y | | | | | | | 310,000 | 564,200 | 1.820 | | | |
| 147 | 8471083 | | | | | | | 310,000 | 564,200 | 1.820 | | | |
| 148 | AY | | | | | | | | | | | | |
| 149 | 8254330 | | | | | | | | | | | | |
| 150 | BE | | | | 600,000 | 1,317,000 | 2.195 | 310,000 | 564,200 | 1.820 | 450,000 | 1,204,875 | 2.678 |
| 151 | 8305780 | | | | | | | | | | | | |
| 152 | 8413413 | | | | 600,000 | 1,317,000 | 2.195 | | | | | | |
| 153 | 8471087 | | | | | | | 310,000 | 564,200 | 1.820 | | | |
| 154 | 8521541 | | | | | | | | | | 450,000 | 1,204,875 | 2.678 |
| 155 | 8574092 | | | | | | | | | | | | |
| 156 | W | | | | | | | | | | | | |

| | | (m) | (n) | (o) | (p) | (q) | (r) | (s) | (t) | (u) | (v) | (w) | (x) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | August-20 | | | September-20 | | | October-20 | | | November-20 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | |
| 157 | 8305784 | | | | | | | | | | | | |
| 158 | **TERM-Fixed Price** | **3,027,871** | **6,613,927** | **2.220** | **2,920,964** | **6,382,702** | **2.361** | **79,423** | **161,498** | **2.030** | **51,000** | **124,695** | **2.445** |
| 159 | AQ | 310,000 | 651,000 | 2.100 | 300,000 | 630,000 | 2.100 | 33,694 | 67,753 | 2.011 | | | |
| 160 | 7869493 | 310,000 | 651,000 | 2.100 | 300,000 | 630,000 | 2.100 | | | | | | |
| 161 | 8544534 | | | | | | | 33,694 | 67,753 | 2.011 | | | |
| 162 | AW | 472,186 | 1,044,465 | 2.265 | 450,000 | 994,500 | 2.228 | | | | | | |
| 163 | 7715322 | 155,000 | 353,400 | 2.280 | 150,000 | 342,000 | 2.280 | | | | | | |
| 164 | 7761428 | 310,000 | 674,250 | 2.175 | 300,000 | 652,500 | 2.175 | | | | | | |
| 165 | 8456674 | 7,186 | 16,815 | 2.340 | | | | | | | | | |
| 166 | C | 7,485 | 16,956 | 2.258 | 4,964 | 14,809 | 2.884 | 45,729 | 93,744 | 2.050 | | | |
| 167 | 8372658 | | | | | | | | | | | | |
| 168 | 8372692 | | | | | | | | | | | | |
| 169 | 8456091 | 1,734 | 3,910 | 2.255 | | | | | | | | | |
| 170 | 8456125 | 1,291 | 2,924 | 2.265 | | | | | | | | | |
| 171 | 8456187 | 2,360 | 5,428 | 2.300 | | | | | | | | | |
| 172 | 8456210 | 214 | 483 | 2.255 | | | | | | | | | |
| 173 | 8456274 | 128 | 282 | 2.200 | | | | | | | | | |
| 174 | 8456298 | 1,758 | 3,929 | 2.235 | | | | | | | | | |
| 175 | 8486091 | | | | 42 | 105 | 2.510 | | | | | | |
| 176 | 8486094 | | | | 1,681 | 4,892 | 2.910 | | | | | | |
| 177 | 8486106 | | | | 1,398 | 4,418 | 3.160 | | | | | | |
| 178 | 8486109 | | | | 1,079 | 3,194 | 2.960 | | | | | | |
| 179 | 8486110 | | | | 764 | 2,200 | 2.880 | | | | | | |
| 180 | 8544518 | | | | | | | 45,729 | 93,744 | 2.050 | | | |
| 181 | E | 155,000 | 340,225 | 2.195 | 150,000 | 329,250 | 2.195 | | | | 51,000 | 124,695 | 2.445 |
| 182 | 7813016 | 155,000 | 340,225 | 2.195 | 150,000 | 329,250 | 2.195 | | | | | | |
| 183 | 7969442 | | | | | | | | | | 51,000 | 124,695 | 2.445 |
| 184 | F | 632,400 | 1,425,535 | 2.248 | 612,000 | 1,379,550 | 2.248 | | | | | | |
| 185 | 7715347 | 167,400 | 380,835 | 2.275 | 162,000 | 368,550 | 2.275 | | | | | | |
| 186 | 7813025 | 155,000 | 341,000 | 2.200 | 150,000 | 330,000 | 2.200 | | | | | | |
| 187 | 7921193 | 310,000 | 703,700 | 2.270 | 300,000 | 681,000 | 2.270 | | | | | | |
| 188 | O | 251,100 | 524,799 | 2.090 | 243,000 | 507,870 | 2.090 | | | | | | |
| 189 | 7967163 | 251,100 | 524,799 | 2.090 | 243,000 | 507,870 | 2.090 | | | | | | |
| 190 | Q | 384,400 | 858,886 | 2.230 | 372,000 | 831,180 | 2.230 | | | | | | |
| 191 | 7813026 | 164,300 | 361,460 | 2.200 | 159,000 | 349,800 | 2.200 | | | | | | |
| 192 | 7921199 | 220,100 | 497,426 | 2.260 | 213,000 | 481,380 | 2.260 | | | | | | |
| 193 | R | 322,400 | 718,394 | 2.230 | 312,000 | 695,220 | 2.230 | | | | | | |
| 194 | 7715335 | 155,000 | 352,625 | 2.275 | 150,000 | 341,250 | 2.275 | | | | | | |
| 195 | 7761447 | 167,400 | 365,769 | 2.185 | 162,000 | 353,970 | 2.185 | | | | | | |
| 196 | BC | 337,900 | 708,942 | 2.098 | 327,000 | 686,073 | 2.098 | | | | | | |
| 197 | 7871365 | 182,900 | 383,907 | 2.099 | 177,000 | 371,523 | 2.099 | | | | | | |
| 198 | 7967147 | 155,000 | 325,035 | 2.097 | 150,000 | 314,550 | 2.097 | | | | | | |
| 199 | BF | 155,000 | 324,725 | 2.095 | 150,000 | 314,250 | 2.095 | | | | | | |
| 200 | 7871451 | 155,000 | 324,725 | 2.095 | 150,000 | 314,250 | 2.095 | | | | | | |
| 201 | **SPOT-Fixed Price** | | | | **657** | **1,468** | **2.235** | | | | | | |
| 202 | AQ | | | | | | | | | | | | |
| 203 | 8319272 | | | | | | | | | | | | |
| 204 | 8319284 | | | | | | | | | | | | |
| 205 | 8319288 | | | | | | | | | | | | |
| 206 | C | | | | 657 | 1,468 | 2.235 | | | | | | |
| 207 | 8319171 | | | | | | | | | | | | |
| 208 | 8319175 | | | | | | | | | | | | |
| 209 | 8319181 | | | | | | | | | | | | |
| 210 | 8511758 | | | | 657 | 1,468 | 2.235 | | | | | | |
| 211 | AA | | | | | | | | | | | | |
| 212 | 8659557 | | | | | | | | | | | | |
| 213 | **NEXUS - Clarington** | **790,500** | **1,594,036** | **1.772** | **754,961** | **1,525,563** | **1.284** | **790,500** | **1,590,750** | **1.595** | **1,107,000** | **2,773,488** | **2.504** |
| 214 | **SPOT-Indexed Price** | **6,200** | **7,874** | **1.270** | **5,920** | **6,453** | **1.090** | **6,200** | **4,588** | **0.740** | | | |
| 215 | AX | 6,200 | 7,874 | 1.270 | 5,920 | 6,453 | 1.090 | 6,200 | 4,588 | 0.740 | | | |
| 216 | 8152770 | | | | | | | | | | | | |
| 217 | 8207831 | | | | | | | | | | | | |
| 218 | 8254115 | | | | | | | | | | | | |
| 219 | 8305567 | 6,200 | 7,874 | 1.270 | 5,920 | 6,453 | 1.090 | 6,200 | 4,588 | 0.740 | | | |
| 220 | 8579319 | | | | | | | | | | | | |
| 221 | 8726474 | | | | | | | | | | | | |
| 222 | **TERM-Fixed Price** | **784,300** | **1,586,162** | **2.023** | **749,041** | **1,519,111** | **1.348** | **784,300** | **1,586,162** | **2.023** | **1,107,000** | **2,773,488** | **2.504** |
| 223 | C | 393,700 | 785,432 | 1.995 | 376,036 | 750,192 | 1.995 | 393,700 | 785,432 | 1.995 | 315,000 | 812,700 | 2.580 |
| 224 | 7358446 | 393,700 | 785,432 | 1.995 | 376,036 | 750,192 | 1.995 | 393,700 | 785,432 | 1.995 | | | |
| 225 | 7517361 | | | | | | | | | | 315,000 | 812,700 | 2.580 |
| 226 | AX | 390,600 | 800,730 | 2.050 | 373,005 | 768,919 | 1.025 | 390,600 | 800,730 | 2.050 | 792,000 | 1,960,788 | 2.478 |
| 227 | 7406537 | 390,600 | 800,730 | 2.050 | 373,005 | 768,919 | 1.025 | 390,600 | 800,730 | 2.050 | | | |
| 228 | 7466208 | | | | | | | | | | 315,000 | 771,750 | 2.450 |
| 229 | 7557647 | | | | | | | | | | 327,000 | 815,538 | 2.494 |
| 230 | 7672566 | | | | | | | | | | 150,000 | 373,500 | 2.490 |
| 231 | **NEXUS - Kensington** | **1,177,070** | **1,970,415** | **1.674** | **1,014,185** | **2,311,328** | **2.279** | **1,174,900** | **2,186,489** | **1.861** | | | |
| 232 | **SPOT-Indexed Price** | **1,177,070** | **1,970,415** | **1.674** | **1,014,185** | **2,311,328** | **2.279** | **1,174,900** | **2,186,489** | **1.861** | | | |
| 233 | C | | | | | | | | | | | | |
| 234 | 8208775 | | | | | | | | | | | | |

| | | (m) | (n) | (o) | (p) | (q) | (r) | (s) | (t) | (u) | (v) | (w) | (x) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | August-20 | | | September-20 | | | October-20 | | | November-20 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | |
| 235 | Z | | | | | | | | | | | | |
| 236 | 8204482 | | | | | | | | | | | | |
| 237 | 8254108 | | | | | | | | | | | | |
| 238 | 8305589 | | | | | | | | | | | | |
| 239 | BD | 1,177,070 | 1,970,415 | 1.674 | 1,014,185 | 2,311,328 | 2.279 | 1,174,900 | 2,186,489 | 1.861 | | | |
| 240 | 8254106 | | | | | | | | | | | | |
| 241 | 8304136 | | | | | | | | | | | | |
| 242 | 8361380 | 1,177,070 | 1,970,415 | 1.674 | | | | | | | | | |
| 243 | 8417206 | | | | 1,014,185 | 2,311,328 | 2.279 | | | | | | |
| 244 | 8470568 | | | | | | | 1,174,900 | 2,186,489 | 1.861 | | | |
| 245 | 8620086 | | | | | | | | | | | | |
| 246 | **Panhandle Field Zone** | **2,039,800** | **4,010,238** | **1.972** | **1,974,000** | **3,880,875** | **1.972** | **2,039,800** | **4,010,238** | **1.972** | **2,010,000** | **4,924,808** | **2.436** |
| 247 | **SPOT-Indexed Price** | | | | | | | | | | | | |
| 248 | C | | | | | | | | | | | | |
| 249 | 8152700 | | | | | | | | | | | | |
| 250 | 8157471 | | | | | | | | | | | | |
| 251 | 8206704 | | | | | | | | | | | | |
| 252 | 8254497 | | | | | | | | | | | | |
| 253 | 8305325 | | | | | | | | | | | | |
| 254 | F | | | | | | | | | | | | |
| 255 | 8624735 | | | | | | | | | | | | |
| 256 | **TERM-Fixed Price** | **2,039,800** | **4,010,238** | **1.972** | **1,974,000** | **3,880,875** | **1.972** | **2,039,800** | **4,010,238** | **1.972** | **2,010,000** | **4,924,808** | **2.436** |
| 257 | AW | 155,000 | 307,675 | 1.985 | 150,000 | 297,750 | 1.985 | 155,000 | 307,675 | 1.985 | 123,000 | 311,498 | 2.533 |
| 258 | 6822722 | 155,000 | 307,675 | 1.985 | 150,000 | 297,750 | 1.985 | 155,000 | 307,675 | 1.985 | | | |
| 259 | 6872767 | | | | | | | | | | 123,000 | 311,498 | 2.533 |
| 260 | C | 635,500 | 1,257,903 | 1.983 | 615,000 | 1,217,325 | 1.983 | 635,500 | 1,257,903 | 1.983 | 369,000 | 866,865 | 2.327 |
| 261 | 6822728 | 238,700 | 476,207 | 1.995 | 231,000 | 460,845 | 1.995 | 238,700 | 476,207 | 1.995 | | | |
| 262 | 7137188 | 396,800 | 781,696 | 1.970 | 384,000 | 756,480 | 1.970 | 396,800 | 781,696 | 1.970 | | | |
| 263 | 7200559 | | | | | | | | | | 60,000 | 136,500 | 2.275 |
| 264 | 7718489 | | | | | | | | | | 180,000 | 435,600 | 2.420 |
| 265 | 7765543 | | | | | | | | | | 129,000 | 294,765 | 2.285 |
| 266 | E | | | | | | | | | | 129,000 | 294,765 | 2.285 |
| 267 | 7765529 | | | | | | | | | | 129,000 | 294,765 | 2.285 |
| 268 | F | 217,000 | 436,170 | 2.010 | 210,000 | 422,100 | 2.010 | 217,000 | 436,170 | 2.010 | 330,000 | 819,705 | 2.508 |
| 269 | 6824613 | | | | | | | | | | 123,000 | 319,800 | 2.600 |
| 270 | 6872685 | 217,000 | 436,170 | 2.010 | 210,000 | 422,100 | 2.010 | 217,000 | 436,170 | 2.010 | | | |
| 271 | 7718488 | | | | | | | | | | 207,000 | 499,905 | 2.415 |
| 272 | M | 310,000 | 573,500 | 1.850 | 300,000 | 555,000 | 1.850 | 310,000 | 573,500 | 1.850 | 597,000 | 1,473,765 | 2.448 |
| 273 | 6874492 | | | | | | | | | | 150,000 | 384,000 | 2.560 |
| 274 | 6973527 | 310,000 | 573,500 | 1.850 | 300,000 | 555,000 | 1.850 | 310,000 | 573,500 | 1.850 | | | |
| 275 | 7417452 | | | | | | | | | | 318,000 | 795,000 | 2.500 |
| 276 | 7765550 | | | | | | | | | | 129,000 | 294,765 | 2.285 |
| 277 | O | | | | | | | | | | 462,000 | 1,158,210 | 2.535 |
| 278 | 6824618 | | | | | | | | | | 150,000 | 392,250 | 2.615 |
| 279 | 7615691 | | | | | | | | | | 312,000 | 765,960 | 2.455 |
| 280 | I | 511,500 | 1,014,971 | 1.982 | 495,000 | 982,230 | 1.982 | 511,500 | 1,014,971 | 1.982 | | | |
| 281 | 6872690 | 182,900 | 363,971 | 1.990 | 177,000 | 352,230 | 1.990 | 182,900 | 363,971 | 1.990 | | | |
| 282 | 7090771 | 142,600 | 278,070 | 1.950 | 138,000 | 269,100 | 1.950 | 142,600 | 278,070 | 1.950 | | | |
| 283 | 7191756 | 186,000 | 372,930 | 2.005 | 180,000 | 360,900 | 2.005 | 186,000 | 372,930 | 2.005 | | | |
| 284 | Q | 210,800 | 420,019 | 1.993 | 204,000 | 406,470 | 1.993 | 210,800 | 420,019 | 1.993 | | | |
| 285 | 7191751 | 210,800 | 420,019 | 1.993 | 204,000 | 406,470 | 1.993 | 210,800 | 420,019 | 1.993 | | | |
| 286 | **Vector-Alliance** | | | | | | | | | | | | |
| 287 | **SPOT-Indexed Price** | | | | | | | | | | | | |
| 288 | E | | | | | | | | | | | | |
| 289 | 8725840 | | | | | | | | | | | | |
| 290 | F | | | | | | | | | | | | |
| 291 | 8152783 | | | | | | | | | | | | |
| 292 | **Viking-Emerson** | **651,000** | **1,314,710** | **2.025** | **630,000** | **1,272,300** | **2.025** | **571,235** | **1,152,894** | **2.025** | **631,500** | **1,671,398** | **2.713** |
| 293 | **SPOT-Indexed Price** | | | | | | | | | | **61,500** | **177,938** | **2.893** |
| 294 | AQ | | | | | | | | | | 61,500 | 177,938 | 2.893 |
| 295 | 8152333 | | | | | | | | | | | | |
| 296 | 8204507 | | | | | | | | | | | | |
| 297 | 8305250 | | | | | | | | | | | | |
| 298 | 8521559 | | | | | | | | | | 61,500 | 177,938 | 2.893 |
| 299 | 8574150 | | | | | | | | | | | | |
| 300 | 8622875 | | | | | | | | | | | | |
| 301 | 8671365 | | | | | | | | | | | | |
| 302 | 8726080 | | | | | | | | | | | | |
| 303 | **TERM-Fixed Price** | **651,000** | **1,314,710** | **2.025** | **630,000** | **1,272,300** | **2.025** | **571,235** | **1,152,894** | **2.025** | **570,000** | **1,493,460** | **2.623** |
| 304 | AQ | 396,800 | 793,600 | 2.000 | 384,000 | 768,000 | 2.000 | 362,764 | 725,528 | 2.000 | | | |
| 305 | 7032205 | 396,800 | 793,600 | 2.000 | 384,000 | 768,000 | 2.000 | 362,764 | 725,528 | 2.000 | | | |
| 306 | C | 254,200 | 521,110 | 2.050 | 246,000 | 504,300 | 2.050 | 208,471 | 427,366 | 2.050 | | | |
| 307 | 7090772 | 254,200 | 521,110 | 2.050 | 246,000 | 504,300 | 2.050 | 208,471 | 427,366 | 2.050 | | | |
| 308 | F | | | | | | | | | | 264,000 | 700,920 | 2.655 |
| 309 | 6978102 | | | | | | | | | | 264,000 | 700,920 | 2.655 |
| 310 | Y | | | | | | | | | | 306,000 | 792,540 | 2.590 |
| 311 | 7147064 | | | | | | | | | | 306,000 | 792,540 | 2.590 |
| 312 | **Grand Total** | **12,797,171** | **25,725,734** | **2.086** | **12,681,823** | **27,081,451** | **2.142** | **10,021,958** | **19,714,833** | **1.980** | **9,657,349** | **24,638,054** | **2.531** |

| | (m) | (n) | (o) | (p) | (q) | (r) | (s) | (t) | (u) | (v) | (w) | (x) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Receipt Point | August-20 | | | September-20 | | | October-20 | | | November-20 | | |
| (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| internal_portfolio | | | | | | | | | | | | |
| (4) Deal Number | | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 Subtotal Index Price | | | | | | | | | | | | |
| 316 Plus Affiliate Spot Index fro | | | | | | | | | | | | |
| 317 Total Spot Index Price | | | | | | | | | | | | |
| 318 Total Fixed Price | | | | | | | | | | | | |
| 319 Grand Total | | | | | | | | | | | | |

| | (1) Receipt Point / (2) Duration/Price Method / internal_portfolio / (4) Deal Number | (y) December-20 Volume (Dth) | (z) December-20 Cost ($) | (aa) December-20 $/Dth | (ab) January-21 Volume (Dth) | (ac) January-21 Cost ($) | (ad) January-21 $/Dth | (ae) February-21 Volume (Dth) | (af) February-21 Cost ($) | (ag) February-21 $/Dth | (ah) March-21 Volume (Dth) | (ai) March-21 Cost ($) | (aj) March-21 $/Dth | (ak) April 2020 - March 2021 Volume (Dth) | (al) April 2020 - March 2021 Cost ($) | (am) April 2020 - March 2021 $/Dth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **ANR ML-3** | **294,500** | **751,952** | **2.550** | **1,875,500** | **4,374,069** | **2.378** | **416,351** | **1,081,129** | **2.591** | **1,875,500** | **5,132,717** | **2.698** | **4,746,851** | **12,067,561** | **2.549** |
| 2 | **SPOT-Indexed Price** | | | | **1,581,000** | **3,622,118** | **2.291** | **151,200** | **404,082** | **2.673** | **1,581,000** | **4,380,765** | **2.772** | **3,313,200** | **8,406,965** | **2.547** |
| 3 | AN | | | | | | | | | | 341,000 | 951,390 | 2.790 | 341,000 | 951,390 | 2.790 |
| 4 | 8728225 | | | | | | | | | | 341,000 | 951,390 | 2.790 | 341,000 | 951,390 | 2.790 |
| 5 | AW | | | | 310,000 | 711,450 | 2.295 | | | | 310,000 | 857,925 | 2.768 | 620,000 | 1,569,375 | 2.531 |
| 6 | 8622867 | | | | 310,000 | 711,450 | 2.295 | | | | | | | 310,000 | 711,450 | 2.295 |
| 7 | 8725829 | | | | | | | | | | 310,000 | 857,925 | 2.768 | 310,000 | 857,925 | 2.768 |
| 8 | F | | | | 310,000 | 709,125 | 2.288 | | | | | | | 310,000 | 709,125 | 2.288 |
| 9 | 8622733 | | | | 310,000 | 709,125 | 2.288 | | | | | | | 310,000 | 709,125 | 2.288 |
| 10 | M | | | | 620,000 | 1,419,800 | 2.290 | | | | 620,000 | 1,714,300 | 2.765 | 1,240,000 | 3,134,100 | 2.528 |
| 11 | 8622755 | | | | 620,000 | 1,419,800 | 2.290 | | | | | | | 620,000 | 1,419,800 | 2.290 |
| 12 | 8725852 | | | | | | | | | | 620,000 | 1,714,300 | 2.765 | 620,000 | 1,714,300 | 2.765 |
| 13 | BE | | | | 341,000 | 781,743 | 2.293 | 151,200 | 404,082 | 2.673 | 310,000 | 857,150 | 2.765 | 802,200 | 2,042,975 | 2.577 |
| 14 | 8623043 | | | | 341,000 | 781,743 | 2.293 | | | | | | | 341,000 | 781,743 | 2.293 |
| 15 | 8671322 | | | | | | | 151,200 | 404,082 | 2.673 | | | | 151,200 | 404,082 | 2.673 |
| 16 | 8726089 | | | | | | | | | | 310,000 | 857,150 | 2.765 | 310,000 | 857,150 | 2.765 |
| 17 | **TERM-Fixed Price** | **294,500** | **751,952** | **2.550** | **294,500** | **751,952** | **2.550** | **265,151** | **677,047** | **2.550** | **294,500** | **751,952** | **2.550** | **1,433,651** | **3,660,596** | **2.550** |
| 18 | C | 161,200 | 416,702 | 2.585 | 161,200 | 416,702 | 2.585 | 145,600 | 376,376 | 2.585 | 161,200 | 416,702 | 2.585 | 785,200 | 2,029,742 | 2.585 |
| 19 | 7924582 | 161,200 | 416,702 | 2.585 | 161,200 | 416,702 | 2.585 | 145,600 | 376,376 | 2.585 | 161,200 | 416,702 | 2.585 | 785,200 | 2,029,742 | 2.585 |
| 20 | Q | 133,300 | 335,250 | 2.515 | 133,300 | 335,250 | 2.515 | 119,551 | 300,671 | 2.515 | 133,300 | 335,250 | 2.515 | 648,451 | 1,630,854 | 2.515 |
| 21 | 7871447 | 133,300 | 335,250 | 2.515 | 133,300 | 335,250 | 2.515 | 119,551 | 300,671 | 2.515 | 133,300 | 335,250 | 2.515 | 648,451 | 1,630,854 | 2.515 |
| 22 | **ANR Southwest Field** | **2,492,400** | **6,095,251** | **2.440** | **2,511,000** | **6,139,426** | **2.434** | **2,187,020** | **5,350,615** | **2.440** | **2,492,400** | **6,095,251** | **2.440** | **28,436,480** | **64,742,381** | **2.242** |
| 23 | **SPOT-Indexed Price** | | | | **18,600** | **44,175** | **2.375** | | | | | | | **129,000** | **202,422** | **1.667** |
| 24 | C | | | | | | | | | | | | | 110,400 | 158,247 | 1.431 |
| 25 | 8152703 | | | | | | | | | | | | | 36,000 | 43,020 | 1.195 |
| 26 | 8206705 | | | | | | | | | | | | | 37,200 | 61,287 | 1.648 |
| 27 | 8305348 | | | | | | | | | | | | | 37,200 | 53,940 | 1.450 |
| 28 | F | | | | 18,600 | 44,175 | 2.375 | | | | | | | 18,600 | 44,175 | 2.375 |
| 29 | 8624731 | | | | 18,600 | 44,175 | 2.375 | | | | | | | 18,600 | 44,175 | 2.375 |
| 30 | **TERM-Fixed Price** | **2,492,400** | **6,095,251** | **2.440** | **2,492,400** | **6,095,251** | **2.440** | **2,187,020** | **5,350,615** | **2.440** | **2,492,400** | **6,095,251** | **2.440** | **28,307,480** | **64,539,959** | **2.260** |
| 31 | AW | | | | | | | | | | | | | 860,100 | 1,840,614 | 2.140 |
| 32 | 7669731 | | | | | | | | | | | | | 860,100 | 1,840,614 | 2.140 |
| 33 | C | 471,200 | 1,226,593 | 2.573 | 471,200 | 1,226,593 | 2.573 | 425,600 | 1,107,890 | 2.573 | 471,200 | 1,226,593 | 2.573 | 3,365,200 | 8,371,493 | 2.436 |
| 34 | 6763281 | 294,500 | 793,678 | 2.695 | 294,500 | 793,678 | 2.695 | 266,000 | 716,870 | 2.695 | 294,500 | 793,678 | 2.695 | 1,434,500 | 3,865,978 | 2.695 |
| 35 | 7306815 | 176,700 | 432,915 | 2.450 | 176,700 | 432,915 | 2.450 | 159,600 | 391,020 | 2.450 | 176,700 | 432,915 | 2.450 | 860,700 | 2,108,715 | 2.450 |
| 36 | 7557706 | | | | | | | | | | | | | 1,070,000 | 2,396,800 | 2.240 |
| 37 | E | 196,850 | 458,661 | 2.330 | 196,850 | 458,661 | 2.330 | 176,682 | 411,669 | 2.330 | 196,850 | 458,661 | 2.330 | 3,355,032 | 7,433,657 | 2.243 |
| 38 | 7613893 | | | | | | | | | | | | | 2,397,300 | 5,202,141 | 2.170 |
| 39 | 7813455 | 196,850 | 458,661 | 2.330 | 196,850 | 458,661 | 2.330 | 176,682 | 411,669 | 2.330 | 196,850 | 458,661 | 2.330 | 957,732 | 2,231,516 | 2.330 |
| 40 | F | 1,075,700 | 2,596,483 | 2.418 | 1,075,700 | 2,596,483 | 2.418 | 913,631 | 2,205,287 | 2.418 | 1,075,700 | 2,596,483 | 2.418 | 6,743,896 | 15,983,811 | 2.342 |
| 41 | 7032215 | 282,100 | 678,451 | 2.405 | 282,100 | 678,451 | 2.405 | 239,598 | 576,233 | 2.405 | 282,100 | 678,451 | 2.405 | 1,358,898 | 3,268,150 | 2.405 |
| 42 | 7306819 | 155,000 | 380,525 | 2.455 | 155,000 | 380,525 | 2.455 | 131,648 | 323,196 | 2.455 | 155,000 | 380,525 | 2.455 | 746,648 | 1,833,021 | 2.455 |
| 43 | 7361582 | 328,600 | 819,857 | 2.495 | 328,600 | 819,857 | 2.495 | 279,090 | 696,330 | 2.495 | 328,600 | 819,857 | 2.495 | 1,582,890 | 3,949,311 | 2.495 |
| 44 | 7513758 | | | | | | | | | | | | | 1,283,968 | 2,850,409 | 2.220 |
| 45 | 7617394 | | | | | | | | | | | | | 278,197 | 625,943 | 2.250 |
| 46 | 7859591 | 310,000 | 717,650 | 2.315 | 310,000 | 717,650 | 2.315 | 263,295 | 609,528 | 2.315 | 310,000 | 717,650 | 2.315 | 1,493,295 | 3,456,978 | 2.315 |
| 47 | M | 525,450 | 1,255,516 | 2.378 | 525,450 | 1,255,516 | 2.378 | 470,186 | 1,123,467 | 2.378 | 525,450 | 1,255,516 | 2.378 | 5,593,836 | 12,647,437 | 2.195 |
| 48 | 6977914 | | | | | | | | | | | | | 599,200 | 1,129,492 | 1.885 |
| 49 | 7251716 | 328,600 | 796,855 | 2.425 | 328,600 | 796,855 | 2.425 | 294,040 | 713,047 | 2.425 | 328,600 | 796,855 | 2.425 | 1,597,840 | 3,874,762 | 2.425 |
| 50 | 7515773 | | | | | | | | | | | | | 1,369,600 | 3,026,816 | 2.210 |
| 51 | 7557664 | | | | | | | | | | | | | 1,070,000 | 2,386,100 | 2.230 |
| 52 | 7813454 | 196,850 | 458,661 | 2.330 | 196,850 | 458,661 | 2.330 | 176,146 | 410,420 | 2.330 | 196,850 | 458,661 | 2.330 | 957,196 | 2,230,267 | 2.330 |
| 53 | O | 223,200 | 558,000 | 2.500 | 223,200 | 558,000 | 2.500 | 200,921 | 502,303 | 2.500 | 223,200 | 558,000 | 2.500 | 5,280,384 | 11,734,305 | 2.224 |
| 54 | 6763135 | | | | | | | | | | | | | 2,760,412 | 6,086,708 | 2.205 |
| 55 | 7240476 | | | | | | | | | | | | | 1,433,701 | 2,931,919 | 2.045 |
| 56 | 7672492 | 223,200 | 558,000 | 2.500 | 223,200 | 558,000 | 2.500 | 200,921 | 502,303 | 2.500 | 223,200 | 558,000 | 2.500 | 1,086,271 | 2,715,678 | 2.500 |
| 57 | Y | | | | | | | | | | | | | 1,284,000 | 2,632,200 | 2.050 |
| 58 | 7240473 | | | | | | | | | | | | | 1,284,000 | 2,632,200 | 2.050 |
| 59 | BE | | | | | | | | | | | | | 1,825,032 | 3,896,443 | 2.135 |
| 60 | 7667897 | | | | | | | | | | | | | 1,825,032 | 3,896,443 | 2.135 |
| 61 | **Chicago** | | | | **77,500** | **179,025** | **2.310** | | | | **1,556,200** | **4,497,604** | **2.895** | **4,122,170** | **8,699,566** | **2.001** |
| 62 | **SPOT-Indexed Price** | | | | **77,500** | **179,025** | **2.310** | | | | **1,556,200** | **4,497,604** | **2.895** | **4,122,170** | **8,699,566** | **2.001** |
| 63 | AQ | | | | | | | | | | | | | 460,000 | 775,450 | 1.628 |
| 64 | 8156014 | | | | | | | | | | | | | 150,000 | 219,000 | 1.460 |
| 65 | 8207799 | | | | | | | | | | | | | 310,000 | 556,450 | 1.795 |
| 66 | C | | | | | | | | | | | | | 267,600 | 390,696 | 1.460 |
| 67 | 8156004 | | | | | | | | | | | | | 267,600 | 390,696 | 1.460 |
| 68 | F | | | | 77,500 | 179,025 | 2.310 | | | | 620,000 | 1,788,700 | 2.885 | 1,307,500 | 2,962,175 | 2.113 |
| 69 | 8155997 | | | | | | | | | | | | | 300,000 | 438,000 | 1.460 |
| 70 | 8207795 | | | | | | | | | | | | | 310,000 | 556,450 | 1.795 |
| 71 | 8624728 | | | | 77,500 | 179,025 | 2.310 | | | | | | | 77,500 | 179,025 | 2.310 |
| 72 | 8725096 | | | | | | | | | | 620,000 | 1,788,700 | 2.885 | 620,000 | 1,788,700 | 2.885 |
| 73 | M | | | | | | | | | | 620,000 | 1,785,600 | 2.880 | 1,530,000 | 3,214,375 | 2.044 |
| 74 | 8155762 | | | | | | | | | | | | | 600,000 | 870,000 | 1.450 |
| 75 | 8206713 | | | | | | | | | | | | | 310,000 | 558,775 | 1.803 |
| 76 | 8725100 | | | | | | | | | | 620,000 | 1,785,600 | 2.880 | 620,000 | 1,785,600 | 2.880 |
| 77 | Y | | | | | | | | | | 316,200 | 923,304 | 2.920 | 316,200 | 923,304 | 2.920 |
| 78 | 8728241 | | | | | | | | | | 316,200 | 923,304 | 2.920 | 316,200 | 923,304 | 2.920 |

| | | (y) | (z) | (aa) | (ab) | (ac) | (ad) | (ae) | (af) | (ag) | (ah) | (ai) | (aj) | (ak) | (al) | (am) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | December-20 | | | January-21 | | | February-21 | | | March-21 | | | April 2020 - March 2021 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | | | | | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | | | | |
| 79 | Q | | | | | | | | | | | | | 240,870 | 433,566 | 1.800 |
| 80 | 8208764 | | | | | | | | | | | | | 240,870 | 433,566 | 1.800 |
| 81 | **Great Lakes-Emerson** | **948,600** | **2,546,720** | **2.653** | **948,600** | **2,562,839** | **2.698** | **862,400** | **2,313,948** | **2.653** | **954,800** | **2,602,838** | **2.759** | **10,904,727** | **26,021,654** | **2.359** |
| 82 | **SPOT-Indexed Price** | **89,900** | **223,177** | **2.483** | **89,900** | **239,296** | **2.662** | **86,800** | **215,264** | **2.480** | **96,100** | **279,295** | **2.906** | **638,605** | **1,543,043** | **2.346** |
| 83 | AQ | 89,900 | 223,177 | 2.483 | 89,900 | 239,296 | 2.662 | 86,800 | 215,264 | 2.480 | 96,100 | 279,295 | 2.906 | 638,605 | 1,543,043 | 2.346 |
| 84 | 8152338 | | | | | | | | | | | | | 57,900 | 108,395 | 1.872 |
| 85 | 8204509 | | | | | | | | | | | | | 62,775 | 116,353 | 1.854 |
| 86 | 8305280 | | | | | | | | | | | | | 69,130 | 112,150 | 1.622 |
| 87 | 8521563 | | | | | | | | | | | | | 86,100 | 249,113 | 2.893 |
| 88 | 8574151 | 89,900 | 223,177 | 2.483 | | | | | | | | | | 89,900 | 223,177 | 2.483 |
| 89 | 8622880 | | | | 89,900 | 239,296 | 2.662 | | | | | | | 89,900 | 239,296 | 2.662 |
| 90 | 8671375 | | | | | | | 86,800 | 215,264 | 2.480 | | | | 86,800 | 215,264 | 2.480 |
| 91 | 8726088 | | | | | | | | | | 96,100 | 279,295 | 2.906 | 96,100 | 279,295 | 2.906 |
| 92 | **TERM-Fixed Price** | **858,700** | **2,323,543** | **2.710** | **858,700** | **2,323,543** | **2.710** | **775,600** | **2,098,684** | **2.710** | **858,700** | **2,323,543** | **2.710** | **10,266,122** | **24,478,611** | **2.362** |
| 93 | AQ | 539,400 | 1,488,574 | 2.758 | 539,400 | 1,488,574 | 2.758 | 487,200 | 1,344,518 | 2.758 | 539,400 | 1,488,574 | 2.758 | 3,975,518 | 10,163,239 | 2.501 |
| 94 | 6934522 | 282,100 | 791,291 | 2.805 | 282,100 | 791,291 | 2.805 | 254,800 | 714,714 | 2.805 | 282,100 | 791,291 | 2.805 | 1,374,100 | 3,854,351 | 2.805 |
| 95 | 7201081 | 257,300 | 697,283 | 2.710 | 257,300 | 697,283 | 2.710 | 232,400 | 629,804 | 2.710 | 257,300 | 697,283 | 2.710 | 1,253,300 | 3,396,443 | 2.710 |
| 96 | 7463583 | | | | | | | | | | | | | 1,345,025 | 2,905,254 | 2.160 |
| 97 | 8470359 | | | | | | | | | | | | | 3,093 | 7,191 | 2.325 |
| 98 | AW | | | | | | | | | | | | | 2,753,247 | 5,919,481 | 2.150 |
| 99 | 6933935 | | | | | | | | | | | | | 2,753,247 | 5,919,481 | 2.150 |
| 100 | C | | | | | | | | | | | | | 1,982,058 | 4,328,785 | 2.198 |
| 101 | 7463672 | | | | | | | | | | | | | 1,348,200 | 2,912,112 | 2.160 |
| 102 | 7561731 | | | | | | | | | | | | | 633,858 | 1,416,673 | 2.235 |
| 103 | I | 319,300 | 834,970 | 2.615 | 319,300 | 834,970 | 2.615 | 288,400 | 754,166 | 2.615 | 319,300 | 834,970 | 2.615 | 1,555,299 | 4,067,107 | 2.615 |
| 104 | 7093249 | 319,300 | 834,970 | 2.615 | 319,300 | 834,970 | 2.615 | 288,400 | 754,166 | 2.615 | 319,300 | 834,970 | 2.615 | 1,555,299 | 4,067,107 | 2.615 |
| 105 | **MichCon city-gate** | **1,333,000** | **3,459,957** | **2.571** | **76,617** | **173,385** | **2.154** | **47,600** | **116,382** | **2.445** | **66,389** | **168,636** | **2.676** | **32,596,762** | **68,697,018** | **2.172** |
| 106 | **SPOT-Indexed Price** | **1,280,300** | **3,331,105** | **2.602** | | | | | | | **13,689** | **39,784** | **2.906** | **14,356,674** | **28,814,353** | **1.999** |
| 107 | AN | | | | | | | | | | | | | 2,643,400 | 5,289,063 | 1.924 |
| 108 | 8305590 | | | | | | | | | | | | | 310,000 | 446,400 | 1.440 |
| 109 | 8359626 | | | | | | | | | | | | | 465,000 | 790,500 | 1.700 |
| 110 | 8363976 | | | | | | | | | | | | | 310,000 | 527,000 | 1.700 |
| 111 | 8413398 | | | | | | | | | | | | | 450,000 | 988,875 | 2.198 |
| 112 | 8472985 | | | | | | | | | | | | | 508,400 | 925,288 | 1.820 |
| 113 | 8522763 | | | | | | | | | | | | | 600,000 | 1,611,000 | 2.685 |
| 114 | AQ | | | | | | | | | | 13,689 | 39,784 | 2.906 | 1,123,739 | 2,252,539 | 2.083 |
| 115 | 8204511 | | | | | | | | | | | | | 155,000 | 278,225 | 1.795 |
| 116 | 8254334 | | | | | | | | | | | | | 190,050 | 303,605 | 1.598 |
| 117 | 8364634 | | | | | | | | | | | | | 155,000 | 263,500 | 1.700 |
| 118 | 8472930 | | | | | | | | | | | | | 310,000 | 563,425 | 1.818 |
| 119 | 8521549 | | | | | | | | | | | | | 300,000 | 804,000 | 2.680 |
| 120 | 8800788 | | | | | | | | | | 13,689 | 39,784 | 2.906 | 13,689 | 39,784 | 2.906 |
| 121 | AW | 310,000 | 807,550 | 2.605 | | | | | | | | | | 310,000 | 807,550 | 2.605 |
| 122 | 8578034 | 310,000 | 807,550 | 2.605 | | | | | | | | | | 310,000 | 807,550 | 2.605 |
| 123 | C | | | | | | | | | | | | | 1,674,000 | 3,425,140 | 2.039 |
| 124 | 8206709 | | | | | | | | | | | | | 310,000 | 554,900 | 1.790 |
| 125 | 8363998 | | | | | | | | | | | | | 310,000 | 527,775 | 1.703 |
| 126 | 8413384 | | | | | | | | | | | | | 450,000 | 988,875 | 2.198 |
| 127 | 8471085 | | | | | | | | | | | | | 310,000 | 564,200 | 1.820 |
| 128 | 8521564 | | | | | | | | | | | | | 294,000 | 789,390 | 2.685 |
| 129 | E | | | | | | | | | | | | | 920,000 | 1,589,050 | 1.694 |
| 130 | 8206698 | | | | | | | | | | | | | 620,000 | 1,109,800 | 1.790 |
| 131 | 8254112 | | | | | | | | | | | | | 300,000 | 479,250 | 1.598 |
| 132 | F | 310,000 | 806,000 | 2.600 | | | | | | | | | | 3,916,450 | 7,776,420 | 1.972 |
| 133 | 8206703 | | | | | | | | | | | | | 310,000 | 554,900 | 1.790 |
| 134 | 8254117 | | | | | | | | | | | | | 450,000 | 718,875 | 1.598 |
| 135 | 8304131 | | | | | | | | | | | | | 465,000 | 669,600 | 1.440 |
| 136 | 8359630 | | | | | | | | | | | | | 465,000 | 790,500 | 1.700 |
| 137 | 8364806 | | | | | | | | | | | | | 60,450 | 102,765 | 1.700 |
| 138 | 8413380 | | | | | | | | | | | | | 600,000 | 1,317,000 | 2.195 |
| 139 | 8421650 | | | | | | | | | | | | | 36,000 | 78,930 | 2.193 |
| 140 | 8470571 | | | | | | | | | | | | | 620,000 | 1,126,850 | 1.818 |
| 141 | 8522755 | | | | | | | | | | | | | 600,000 | 1,611,000 | 2.685 |
| 142 | 8574091 | 310,000 | 806,000 | 2.600 | | | | | | | | | | 310,000 | 806,000 | 2.600 |
| 143 | M | 350,300 | 910,780 | 2.600 | | | | | | | | | | 849,400 | 1,817,894 | 2.209 |
| 144 | 8472943 | | | | | | | | | | | | | 499,100 | 907,114 | 1.818 |
| 145 | 8578022 | 350,300 | 910,780 | 2.600 | | | | | | | | | | 350,300 | 910,780 | 2.600 |
| 146 | Y | | | | | | | | | | | | | 310,000 | 564,200 | 1.820 |
| 147 | 8471083 | | | | | | | | | | | | | 310,000 | 564,200 | 1.820 |
| 148 | AY | | | | | | | | | | | | | 300,000 | 478,500 | 1.595 |
| 149 | 8254330 | | | | | | | | | | | | | 300,000 | 478,500 | 1.595 |
| 150 | BE | 310,000 | 806,775 | 2.603 | | | | | | | | | | 1,980,000 | 4,339,250 | 2.147 |
| 151 | 8305780 | | | | | | | | | | | | | 310,000 | 446,400 | 1.440 |
| 152 | 8413413 | | | | | | | | | | | | | 600,000 | 1,317,000 | 2.195 |
| 153 | 8471087 | | | | | | | | | | | | | 310,000 | 564,200 | 1.820 |
| 154 | 8521541 | | | | | | | | | | | | | 450,000 | 1,204,875 | 2.678 |
| 155 | 8574092 | 310,000 | 806,775 | 2.603 | | | | | | | | | | 310,000 | 806,775 | 2.603 |
| 156 | W | | | | | | | | | | | | | 329,685 | 474,746 | 1.440 |

| | | (y) | (z) | (aa) | (ab) | (ac) | (ad) | (ae) | (af) | (ag) | (ah) | (ai) | (aj) | (ak) | (al) | (am) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | December-20 | | | January-21 | | | February-21 | | | March-21 | | | April 2020 - March 2021 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | | | | | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | | | | |
| 157 | 8305784 | | | | | | | | | | | | | 329,685 | 474,746 | 1.440 |
| 158 | **TERM-Fixed Price** | **52,700** | **128,852** | **2.445** | **52,700** | **128,852** | **2.445** | **47,600** | **116,382** | **2.445** | **52,700** | **128,852** | **2.445** | **18,152,514** | **39,704,498** | **2.238** |
| 159 | AQ | | | | | | | | | | | | | 1,863,694 | 3,910,753 | 2.087 |
| 160 | 7869493 | | | | | | | | | | | | | 1,830,000 | 3,843,000 | 2.100 |
| 161 | 8544534 | | | | | | | | | | | | | 33,694 | 67,753 | 2.011 |
| 162 | AW | | | | | | | | | | | | | 2,752,186 | 6,083,265 | 2.236 |
| 163 | 7715322 | | | | | | | | | | | | | 915,000 | 2,086,200 | 2.280 |
| 164 | 7761428 | | | | | | | | | | | | | 1,830,000 | 3,980,250 | 2.175 |
| 165 | 8456674 | | | | | | | | | | | | | 7,186 | 16,815 | 2.340 |
| 166 | C | | | | | | | | | | | | | 67,334 | 148,151 | 2.444 |
| 167 | 8372658 | | | | | | | | | | | | | 4,643 | 11,608 | 2.500 |
| 168 | 8372692 | | | | | | | | | | | | | 4,513 | 11,034 | 2.445 |
| 169 | 8456091 | | | | | | | | | | | | | 1,734 | 3,910 | 2.255 |
| 170 | 8456125 | | | | | | | | | | | | | 1,291 | 2,924 | 2.265 |
| 171 | 8456187 | | | | | | | | | | | | | 2,360 | 5,428 | 2.300 |
| 172 | 8456210 | | | | | | | | | | | | | 214 | 483 | 2.255 |
| 173 | 8456274 | | | | | | | | | | | | | 128 | 282 | 2.200 |
| 174 | 8456298 | | | | | | | | | | | | | 1,758 | 3,929 | 2.235 |
| 175 | 8486091 | | | | | | | | | | | | | 42 | 105 | 2.510 |
| 176 | 8486094 | | | | | | | | | | | | | 1,681 | 4,892 | 2.910 |
| 177 | 8486106 | | | | | | | | | | | | | 1,398 | 4,418 | 3.160 |
| 178 | 8486109 | | | | | | | | | | | | | 1,079 | 3,194 | 2.960 |
| 179 | 8486110 | | | | | | | | | | | | | 764 | 2,200 | 2.880 |
| 180 | 8544518 | | | | | | | | | | | | | 45,729 | 93,744 | 2.050 |
| 181 | E | 52,700 | 128,852 | 2.445 | 52,700 | 128,852 | 2.445 | 47,600 | 116,382 | 2.445 | 52,700 | 128,852 | 2.445 | 1,171,700 | 2,636,057 | 2.309 |
| 182 | 7813016 | | | | | | | | | | | | | 915,000 | 2,008,425 | 2.195 |
| 183 | 7969442 | 52,700 | 128,852 | 2.445 | 52,700 | 128,852 | 2.445 | 47,600 | 116,382 | 2.445 | 52,700 | 128,852 | 2.445 | 256,700 | 627,632 | 2.445 |
| 184 | F | | | | | | | | | | | | | 3,733,200 | 8,415,255 | 2.248 |
| 185 | 7715347 | | | | | | | | | | | | | 988,200 | 2,248,155 | 2.275 |
| 186 | 7813025 | | | | | | | | | | | | | 915,000 | 2,013,000 | 2.200 |
| 187 | 7921193 | | | | | | | | | | | | | 1,830,000 | 4,154,100 | 2.270 |
| 188 | O | | | | | | | | | | | | | 1,482,300 | 3,098,007 | 2.090 |
| 189 | 7967163 | | | | | | | | | | | | | 1,482,300 | 3,098,007 | 2.090 |
| 190 | Q | | | | | | | | | | | | | 2,269,200 | 5,070,198 | 2.230 |
| 191 | 7813026 | | | | | | | | | | | | | 969,900 | 2,133,780 | 2.200 |
| 192 | 7921199 | | | | | | | | | | | | | 1,299,300 | 2,936,418 | 2.260 |
| 193 | R | | | | | | | | | | | | | 1,903,200 | 4,240,842 | 2.230 |
| 194 | 7715335 | | | | | | | | | | | | | 915,000 | 2,081,625 | 2.275 |
| 195 | 7761447 | | | | | | | | | | | | | 988,200 | 2,159,217 | 2.185 |
| 196 | BC | | | | | | | | | | | | | 1,994,700 | 4,185,045 | 2.098 |
| 197 | 7871365 | | | | | | | | | | | | | 1,079,700 | 2,266,290 | 2.099 |
| 198 | 7967147 | | | | | | | | | | | | | 915,000 | 1,918,755 | 2.097 |
| 199 | BF | | | | | | | | | | | | | 915,000 | 1,916,925 | 2.095 |
| 200 | 7871451 | | | | | | | | | | | | | 915,000 | 1,916,925 | 2.095 |
| 201 | **SPOT-Fixed Price** | | | | **23,917** | **44,533** | **1.862** | | | | | | | **87,574** | **178,167** | **2.090** |
| 202 | AQ | | | | | | | | | | | | | 38,400 | 79,808 | 2.078 |
| 203 | 8319272 | | | | | | | | | | | | | 12,800 | 27,008 | 2.110 |
| 204 | 8319284 | | | | | | | | | | | | | 12,800 | 26,496 | 2.070 |
| 205 | 8319288 | | | | | | | | | | | | | 12,800 | 26,304 | 2.055 |
| 206 | C | | | | | | | | | | | | | 25,257 | 53,825 | 2.155 |
| 207 | 8319171 | | | | | | | | | | | | | 8,200 | 17,712 | 2.160 |
| 208 | 8319175 | | | | | | | | | | | | | 8,200 | 17,384 | 2.120 |
| 209 | 8319181 | | | | | | | | | | | | | 8,200 | 17,261 | 2.105 |
| 210 | 8511758 | | | | | | | | | | | | | 657 | 1,468 | 2.235 |
| 211 | AA | | | | 23,917 | 44,533 | 1.862 | | | | | | | 23,917 | 44,533 | 1.862 |
| 212 | 8659557 | | | | 23,917 | 44,533 | 1.862 | | | | | | | 23,917 | 44,533 | 1.862 |
| 213 | **NEXUS - Clarington** | **1,184,200** | **2,935,254** | **2.347** | **1,143,900** | **2,865,938** | **2.504** | **1,033,200** | **2,588,589** | **2.504** | **1,184,200** | **2,964,673** | **2.493** | **12,197,428** | **26,476,129** | **2.068** |
| 214 | **SPOT-Indexed Price** | **40,300** | **69,316** | **1.720** | | | | | | | **40,300** | **98,735** | **2.450** | **1,248,108** | **1,636,735** | **1.400** |
| 215 | AX | 40,300 | 69,316 | 1.720 | | | | | | | 40,300 | 98,735 | 2.450 | 1,248,108 | 1,636,735 | 1.400 |
| 216 | 8152770 | | | | | | | | | | | | | 1,131,000 | 1,425,060 | 1.260 |
| 217 | 8207831 | | | | | | | | | | | | | 6,200 | 9,424 | 1.520 |
| 218 | 8254115 | | | | | | | | | | | | | 6,000 | 8,040 | 1.340 |
| 219 | 8305567 | | | | | | | | | | | | | 24,308 | 26,160 | 1.078 |
| 220 | 8579319 | 40,300 | 69,316 | 1.720 | | | | | | | | | | 40,300 | 69,316 | 1.720 |
| 221 | 8726474 | | | | | | | | | | 40,300 | 98,735 | 2.450 | 40,300 | 98,735 | 2.450 |
| 222 | **TERM-Fixed Price** | **1,143,900** | **2,865,938** | **2.504** | **1,143,900** | **2,865,938** | **2.504** | **1,033,200** | **2,588,589** | **2.504** | **1,143,900** | **2,865,938** | **2.504** | **10,949,320** | **24,839,394** | **2.240** |
| 223 | C | 325,500 | 839,790 | 2.580 | 325,500 | 839,790 | 2.580 | 294,000 | 758,520 | 2.580 | 325,500 | 839,790 | 2.580 | 4,284,872 | 9,475,837 | 2.239 |
| 224 | 7358446 | | | | | | | | | | | | | 2,699,372 | 5,385,247 | 1.995 |
| 225 | 7517361 | 325,500 | 839,790 | 2.580 | 325,500 | 839,790 | 2.580 | 294,000 | 758,520 | 2.580 | 325,500 | 839,790 | 2.580 | 1,585,500 | 4,090,590 | 2.580 |
| 226 | AX | 818,400 | 2,026,148 | 2.478 | 818,400 | 2,026,148 | 2.478 | 739,200 | 1,830,069 | 2.478 | 818,400 | 2,026,148 | 2.478 | 6,664,448 | 15,363,557 | 2.240 |
| 227 | 7406537 | | | | | | | | | | | | | 2,678,048 | 5,494,257 | 1.794 |
| 228 | 7466208 | 325,500 | 797,475 | 2.450 | 325,500 | 797,475 | 2.450 | 294,000 | 720,300 | 2.450 | 325,500 | 797,475 | 2.450 | 1,585,500 | 3,884,475 | 2.450 |
| 229 | 7557647 | 337,900 | 842,723 | 2.494 | 337,900 | 842,723 | 2.494 | 305,200 | 761,169 | 2.494 | 337,900 | 842,723 | 2.494 | 1,645,900 | 4,104,875 | 2.494 |
| 230 | 7672566 | 155,000 | 385,950 | 2.490 | 155,000 | 385,950 | 2.490 | 140,000 | 348,600 | 2.490 | 155,000 | 385,950 | 2.490 | 755,000 | 1,879,950 | 2.490 |
| 231 | **NEXUS - Kensington** | | | | **1,174,900** | **2,722,243** | **2.317** | | | | | | | **7,446,426** | **13,493,333** | **1.773** |
| 232 | **SPOT-Indexed Price** | | | | **1,174,900** | **2,722,243** | **2.317** | | | | | | | **7,446,426** | **13,493,333** | **1.773** |
| 233 | C | | | | | | | | | | | | | 155,000 | 267,375 | 1.725 |
| 234 | 8208775 | | | | | | | | | | | | | 155,000 | 267,375 | 1.725 |

| | | (y) | (z) | (aa) | (ab) | (ac) | (ad) | (ae) | (af) | (ag) | (ah) | (ai) | (aj) | (ak) | (al) | (am) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Receipt Point | December-20 | | | January-21 | | | February-21 | | | March-21 | | | April 2020 - March 2021 | | |
| | (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| | internal_portfolio | | | | | | | | | | | | | | | |
| | (4) Deal Number | | | | | | | | | | | | | | | |
| 235 | Z | | | | | | | | | | | | | 1,157,096 | 1,763,509 | 1.502 |
| 236 | 8204482 | | | | | | | | | | | | | 465,000 | 759,810 | 1.634 |
| 237 | 8254108 | | | | | | | | | | | | | 388,500 | 602,952 | 1.552 |
| 238 | 8305589 | | | | | | | | | | | | | 303,596 | 400,747 | 1.320 |
| 239 | BD | | | | 1,174,900 | 2,722,243 | 2.317 | | | | | | | 6,134,330 | 11,462,449 | 1.897 |
| 240 | 8254106 | | | | | | | | | | | | | 750,000 | 1,171,500 | 1.562 |
| 241 | 8304136 | | | | | | | | | | | | | 843,275 | 1,100,474 | 1.305 |
| 242 | 8361380 | | | | | | | | | | | | | 1,177,070 | 1,970,415 | 1.674 |
| 243 | 8417206 | | | | | | | | | | | | | 1,014,185 | 2,311,328 | 2.279 |
| 244 | 8470568 | | | | | | | | | | | | | 1,174,900 | 2,186,489 | 1.861 |
| 245 | 8620086 | | | | 1,174,900 | 2,722,243 | 2.317 | | | | | | | 1,174,900 | 2,722,243 | 2.317 |
| 246 | **Panhandle Field Zone** | **2,077,000** | **5,088,968** | **2.436** | **2,104,900** | **5,153,208** | **2.425** | **1,865,524** | **4,570,626** | **2.436** | **2,077,000** | **5,088,968** | **2.436** | **24,495,004** | **52,890,944** | **2.164** |
| 247 | **SPOT-Indexed Price** | | | | **27,900** | **64,240** | **2.303** | | | | | | | **307,280** | **445,033** | **1.470** |
| 248 | C | | | | | | | | | | | | | 279,380 | 380,793 | 1.304 |
| 249 | 8152700 | | | | | | | | | | | | | 29,700 | 31,779 | 1.070 |
| 250 | 8157471 | | | | | | | | | | | | | 39,000 | 41,828 | 1.073 |
| 251 | 8206704 | | | | | | | | | | | | | 70,990 | 110,567 | 1.558 |
| 252 | 8254497 | | | | | | | | | | | | | 68,700 | 101,848 | 1.483 |
| 253 | 8305325 | | | | | | | | | | | | | 70,990 | 94,772 | 1.335 |
| 254 | F | | | | 27,900 | 64,240 | 2.303 | | | | | | | 27,900 | 64,240 | 2.303 |
| 255 | 8624735 | | | | 27,900 | 64,240 | 2.303 | | | | | | | 27,900 | 64,240 | 2.303 |
| 256 | **TERM-Fixed Price** | **2,077,000** | **5,088,968** | **2.436** | **2,077,000** | **5,088,968** | **2.436** | **1,865,524** | **4,570,626** | **2.436** | **2,077,000** | **5,088,968** | **2.436** | **24,187,724** | **52,445,912** | **2.198** |
| 257 | AW | 127,100 | 321,881 | 2.533 | 127,100 | 321,881 | 2.533 | 114,799 | 290,728 | 2.533 | 127,100 | 321,881 | 2.533 | 1,689,099 | 3,691,818 | 2.213 |
| 258 | 6822722 | | | | | | | | | | | | | 1,070,000 | 2,123,950 | 1.985 |
| 259 | 6872767 | 127,100 | 321,881 | 2.533 | 127,100 | 321,881 | 2.533 | 114,799 | 290,728 | 2.533 | 127,100 | 321,881 | 2.533 | 619,099 | 1,567,868 | 2.533 |
| 260 | C | 381,300 | 895,761 | 2.327 | 381,300 | 895,761 | 2.327 | 344,400 | 809,074 | 2.327 | 381,300 | 895,761 | 2.327 | 6,244,300 | 13,046,806 | 2.161 |
| 261 | 6822728 | | | | | | | | | | | | | 1,647,800 | 3,287,361 | 1.995 |
| 262 | 7137188 | | | | | | | | | | | | | 2,739,200 | 5,396,224 | 1.970 |
| 263 | 7200559 | 62,000 | 141,050 | 2.275 | 62,000 | 141,050 | 2.275 | 56,000 | 127,400 | 2.275 | 62,000 | 141,050 | 2.275 | 302,000 | 687,050 | 2.275 |
| 264 | 7718489 | 186,000 | 450,120 | 2.420 | 186,000 | 450,120 | 2.420 | 168,000 | 406,560 | 2.420 | 186,000 | 450,120 | 2.420 | 906,000 | 2,192,520 | 2.420 |
| 265 | 7765543 | 133,300 | 304,591 | 2.285 | 133,300 | 304,591 | 2.285 | 120,400 | 275,114 | 2.285 | 133,300 | 304,591 | 2.285 | 649,300 | 1,483,651 | 2.285 |
| 266 | E | 133,300 | 304,591 | 2.285 | 133,300 | 304,591 | 2.285 | 120,400 | 275,114 | 2.285 | 133,300 | 304,591 | 2.285 | 649,300 | 1,483,651 | 2.285 |
| 267 | 7765529 | 133,300 | 304,591 | 2.285 | 133,300 | 304,591 | 2.285 | 120,400 | 275,114 | 2.285 | 133,300 | 304,591 | 2.285 | 649,300 | 1,483,651 | 2.285 |
| 268 | F | 341,000 | 847,029 | 2.508 | 341,000 | 847,029 | 2.508 | 308,000 | 765,058 | 2.508 | 341,000 | 847,029 | 2.508 | 3,159,000 | 7,136,829 | 2.303 |
| 269 | 6824613 | 127,100 | 330,460 | 2.600 | 127,100 | 330,460 | 2.600 | 114,800 | 298,480 | 2.600 | 127,100 | 330,460 | 2.600 | 619,100 | 1,609,660 | 2.600 |
| 270 | 6872685 | | | | | | | | | | | | | 1,498,000 | 3,010,980 | 2.010 |
| 271 | 7718488 | 213,900 | 516,569 | 2.415 | 213,900 | 516,569 | 2.415 | 193,200 | 466,578 | 2.415 | 213,900 | 516,569 | 2.415 | 1,041,900 | 2,516,189 | 2.415 |
| 272 | M | 616,900 | 1,522,891 | 2.448 | 616,900 | 1,522,891 | 2.448 | 546,725 | 1,349,656 | 2.448 | 616,900 | 1,522,891 | 2.448 | 5,134,425 | 11,351,092 | 2.258 |
| 273 | 6874492 | 155,000 | 396,800 | 2.560 | 155,000 | 396,800 | 2.560 | 137,369 | 351,665 | 2.560 | 155,000 | 396,800 | 2.560 | 752,369 | 1,926,065 | 2.560 |
| 274 | 6973527 | | | | | | | | | | | | | 2,140,000 | 3,959,000 | 1.850 |
| 275 | 7417452 | 328,600 | 821,500 | 2.500 | 328,600 | 821,500 | 2.500 | 291,221 | 728,053 | 2.500 | 328,600 | 821,500 | 2.500 | 1,595,021 | 3,987,553 | 2.500 |
| 276 | 7765550 | 133,300 | 304,591 | 2.285 | 133,300 | 304,591 | 2.285 | 118,135 | 269,938 | 2.285 | 133,300 | 304,591 | 2.285 | 647,035 | 1,478,475 | 2.285 |
| 277 | O | 477,400 | 1,196,817 | 2.535 | 477,400 | 1,196,817 | 2.535 | 431,200 | 1,080,996 | 2.535 | 477,400 | 1,196,817 | 2.535 | 2,325,400 | 5,829,657 | 2.535 |
| 278 | 6824618 | 155,000 | 405,325 | 2.615 | 155,000 | 405,325 | 2.615 | 140,000 | 366,100 | 2.615 | 155,000 | 405,325 | 2.615 | 755,000 | 1,974,325 | 2.615 |
| 279 | 7615691 | 322,400 | 791,492 | 2.455 | 322,400 | 791,492 | 2.455 | 291,200 | 714,896 | 2.455 | 322,400 | 791,492 | 2.455 | 1,570,400 | 3,855,332 | 2.455 |
| 280 | I | | | | | | | | | | | | | 3,531,000 | 7,006,574 | 1.982 |
| 281 | 6872690 | | | | | | | | | | | | | 1,262,600 | 2,512,574 | 1.990 |
| 282 | 7090771 | | | | | | | | | | | | | 984,400 | 1,919,580 | 1.950 |
| 283 | 7191756 | | | | | | | | | | | | | 1,284,000 | 2,574,420 | 2.005 |
| 284 | Q | | | | | | | | | | | | | 1,455,200 | 2,899,486 | 1.993 |
| 285 | 7191751 | | | | | | | | | | | | | 1,455,200 | 2,899,486 | 1.993 |
| 286 | **Vector-Alliance** | | | | | | | | | | **601,400** | **1,750,074** | **2.910** | **901,400** | **2,184,324** | **2.179** |
| 287 | **SPOT-Indexed Price** | | | | | | | | | | **601,400** | **1,750,074** | **2.910** | **901,400** | **2,184,324** | **2.179** |
| 288 | E | | | | | | | | | | 601,400 | 1,750,074 | 2.910 | 601,400 | 1,750,074 | 2.910 |
| 289 | 8725840 | | | | | | | | | | 601,400 | 1,750,074 | 2.910 | 601,400 | 1,750,074 | 2.910 |
| 290 | F | | | | | | | | | | | | | 300,000 | 434,250 | 1.448 |
| 291 | 8152783 | | | | | | | | | | | | | 300,000 | 434,250 | 1.448 |
| 292 | **Viking-Emerson** | **652,550** | **1,701,005** | **2.576** | **651,000** | **1,708,894** | **2.639** | **588,000** | **1,532,776** | **2.575** | **551,340** | **1,498,538** | **1.630** | **7,432,220** | **16,911,053** | **2.158** |
| 293 | **SPOT-Indexed Price** | **63,550** | **157,763** | **2.483** | **62,000** | **165,652** | **2.672** | **56,000** | **138,880** | **2.480** | **47,974** | **139,427** | **2.906** | **297,619** | **791,408** | **2.349** |
| 294 | AQ | 63,550 | 157,763 | 2.483 | 62,000 | 165,652 | 2.672 | 56,000 | 138,880 | 2.480 | 47,974 | 139,427 | 2.906 | 297,619 | 791,408 | 2.349 |
| 295 | 8152333 | | | | | | | | | | | | | 2,100 | 3,931 | 1.872 |
| 296 | 8204507 | | | | | | | | | | | | | 2,170 | 4,022 | 1.854 |
| 297 | 8305250 | | | | | | | | | | | | | 2,325 | 3,795 | 1.632 |
| 298 | 8521559 | | | | | | | | | | | | | 61,500 | 177,938 | 2.893 |
| 299 | 8574150 | 63,550 | 157,763 | 2.483 | | | | | | | | | | 63,550 | 157,763 | 2.483 |
| 300 | 8622875 | | | | 62,000 | 165,652 | 2.672 | | | | | | | 62,000 | 165,652 | 2.672 |
| 301 | 8671365 | | | | | | | 56,000 | 138,880 | 2.480 | | | | 56,000 | 138,880 | 2.480 |
| 302 | 8726080 | | | | | | | | | | 47,974 | 139,427 | 2.906 | 47,974 | 139,427 | 2.906 |
| 303 | **TERM-Fixed Price** | **589,000** | **1,543,242** | **2.623** | **589,000** | **1,543,242** | **2.623** | **532,000** | **1,393,896** | **2.623** | **503,366** | **1,359,111** | **1.311** | **7,134,601** | **16,119,645** | **2.099** |
| 304 | AQ | | | | | | | | | | | | | 2,666,764 | 5,333,528 | 2.000 |
| 305 | 7032205 | | | | | | | | | | | | | 2,666,764 | 5,333,528 | 2.000 |
| 306 | C | | | | | | | | | | | | | 1,684,471 | 3,453,166 | 2.050 |
| 307 | 7090772 | | | | | | | | | | | | | 1,684,471 | 3,453,166 | 2.050 |
| 308 | F | 272,800 | 724,284 | 2.655 | 272,800 | 724,284 | 2.655 | 246,400 | 654,192 | 2.655 | 233,137 | 638,410 | 1.328 | 1,289,137 | 3,442,090 | 2.213 |
| 309 | 6978102 | 272,800 | 724,284 | 2.655 | 272,800 | 724,284 | 2.655 | 246,400 | 654,192 | 2.655 | 233,137 | 638,410 | 1.328 | 1,289,137 | 3,442,090 | 2.213 |
| 310 | Y | 316,200 | 818,958 | 2.590 | 316,200 | 818,958 | 2.590 | 285,600 | 739,704 | 2.590 | 270,229 | 720,701 | 1.295 | 1,494,229 | 3,890,861 | 2.158 |
| 311 | 7147064 | 316,200 | 818,958 | 2.590 | 316,200 | 818,958 | 2.590 | 285,600 | 739,704 | 2.590 | 270,229 | 720,701 | 1.295 | 1,494,229 | 3,890,861 | 2.158 |
| 312 | **Grand Total** | **8,982,250** | **22,579,105** | **2.479** | **10,563,917** | **25,879,026** | **2.449** | **7,000,095** | **17,554,065** | **2.492** | **11,359,229** | **29,799,298** | **2.467** | **133,279,468** | **292,183,962** | **2.195** |

| | (y) | (z) | (aa) | (ab) | (ac) | (ad) | (ae) | (af) | (ag) | (ah) | (ai) | (aj) | (ak) | (al) | (am) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Receipt Point | December-20 | | | January-21 | | | February-21 | | | March-21 | | | April 2020 - March 2021 | | |
| (2) Duration/Price Method | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth | Volume (Dth) | Cost ($) | $/Dth |
| internal_portfolio | | | | | | | | | | | | | | | |
| (4) Deal Number | | | | | | | | | | | | | | | |
| 313 | | | | | | | | | | | | | | | |
| 314 | | | | | | | | | | | | | | | Vol Wt Avg Price |
| 315 Subtotal Index Price | | | | | | | | | | | | | **32,760,482** | **66,217,180** | **2.021** |
| 316 Plus Affiliate Spot Index fro | | | | | | | | | | | | | **3,758,679** | **9,393,512** | **2.499** |
| 317 Total Spot Index Price | | | | | | | | | | | | | **36,519,161** | **75,610,693** | **2.070** |
| 318 Total Fixed Price | | | | | | | | | | | | | **103,219,801** | **231,462,940** | **2.242** |
| 319 Grand Total | | | | | | | | | | | | | **139,738,962** | **307,073,633** | **2.197** |

| Line | Month | Purchase Volume (Dth) | Commodity Cost ($) | Pipeline Transportation Costs ($) | Total Gas Costs ($) | Total Gas Costs ($/Dth) |
|---|---|---|---|---|---|---|
| | | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) |
| 1 | Apr-20 | 12,439,332 | $ 24,070,035 | $ 5,006,730 | $ 29,076,764 | $ 2.34 |
| 2 | May-20 | 13,213,870 | 26,675,666 | 4,992,935 | $ 31,668,601 | $ 2.40 |
| 3 | Jun-20 | 11,984,250 | 23,944,188 | 4,874,317 | $ 28,818,504 | $ 2.40 |
| 4 | Jul-20 | 12,578,224 | 24,522,507 | 4,953,446 | $ 29,475,953 | $ 2.34 |
| 5 | Aug-20 | 12,797,171 | 25,725,734 | 4,976,681 | $ 30,702,415 | $ 2.40 |
| 6 | Sep-20 | 12,681,823 | 27,081,451 | 4,872,870 | $ 31,954,321 | $ 2.52 |
| 7 | Oct-20 | 10,021,958 | 19,714,833 | 4,915,034 | $ 24,629,868 | $ 2.46 |
| 8 | Nov-20 | 9,657,349 | 24,638,054 | 5,183,277 | $ 29,821,331 | $ 3.09 |
| 9 | Dec-20 | 8,982,250 | 22,579,105 | 5,298,626 | $ 27,877,731 | $ 3.10 |
| 10 | Jan-21 | 10,563,917 | 25,879,026 | 5,492,120 | $ 31,371,146 | $ 2.97 |
| 11 | Feb-21 | 7,000,095 | 17,554,065 | 5,108,420 | $ 22,662,485 | $ 3.24 |
| 12 | Mar-21 | 11,359,229 | 29,799,298 | 3,855,655 | $ 33,654,954 | $ 2.96 |
| 13 | Total (Dth) | 133,279,468 | $ 292,183,962 | $ 59,530,111 | $ 351,714,073 | $ 2.64 |
| 14 | Affiliate Purchases (Dth) | 6,459,494 | 14,889,671 | | 14,889,671 | |
| 15 | Less: Fuel (Dth) | 2,407,600 | | | | |
| 16 | Less: Btu Adjustment (Dth) | 7,026,332 | | | | |
| 17 | Total Mcf @ 14.65 | 130,305,030 | $ 307,073,633 | $ 59,530,111 | $ 366,603,744 | $ 2.81 |
| 18 | $CAD to $ USD Exchange rate adjustment (Vector) | | | | | |
| 19 | Great Lakes RP17-598-003 Rate Settlement Refund | | | - | - | |
| 20 | Tariff Purchases (Mcf) & Escheat (Mcf) | | | | - | |
| 21 | Cashouts (Mcf) | (22,255) | | (138,062) | (138,062) | $ 6.20 |
| 22 | Exchange | 435,291 | 1,267,829 | - | 1,267,829 | $ 2.91 |
| 23 | Preliminary to Final Adjustments (incl rounding adj) | (17,649) | (211,994) | 948,627 | 736,633 | $ (41.74) |
| 24 | Total (Mcf @ 14.65) (Ties to 45-day report) | 130,700,417 | $ 308,129,469 | $ 60,340,676 | $ 368,470,145 | $ 2.82 |
| 25 | | | | | | |
| 26 | Plan Volume (Mcf @ 14.65) | 129,601,465 | $ 311,632,164 | $ 61,839,452 | $ 373,471,616 | $ 2.88 |
| 27 | | | | | | |
| 28 | Variance from Plan (Mcf @ 14.65) | 1,098,952 | $ (3,502,695) | $ (1,498,776) | $ (5,001,471) | $ (0.06) |

| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) | (col. i) | (col. j) | (col. k) | (col. l) | (col. m) | (col. n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Transport Route** | **Apr-20** | **May-20** | **Jun-20** | **Jul-20** | **Aug-20** | **Sep-20** | **Oct-20** | **Nov-20** | **Dec-20** | **Jan-21** | **Feb-21** | **Mar-21** | **Total** |
| 1 | **ANR Alpena** | **272,058** | **270,264** | **255,950** | **255,950** | **255,950** | **255,950** | **255,950** | **255,450** | **255,450** | **256,382** | **255,450** | **274,175** | **3,118,979** |
| 2 | Capacity Release | (30,500) | (30,500) | (30,500) | (30,500) | (30,500) | (30,500) | (30,500) | (31,000) | (31,000) | (31,000) | (31,000) | (31,000) | (368,500) |
| 3 | Transportation Charges | 302,558 | 300,764 | 286,450 | 286,450 | 286,450 | 286,450 | 286,450 | 286,450 | 286,450 | 287,382 | 286,450 | 305,175 | 3,487,479 |
| 4 | **ANR SW Oklahoma** | **936,082** | **938,491** | **935,766** | **938,492** | **937,629** | **935,293** | **917,034** | **935,639** | **937,503** | **937,971** | **930,479** | **937,543** | **11,217,922** |
| 5 | Transportation Charges | 936,082 | 938,491 | 935,766 | 938,492 | 937,629 | 935,293 | 917,034 | 935,639 | 937,503 | 937,971 | 930,479 | 937,543 | 11,217,922 |
| 6 | **Great Lakes Emerson** | **222,193** | **220,233** | **218,887** | **219,764** | **215,470** | **217,761** | **221,015** | **224,215** | **228,671** | **228,816** | **226,582** | **225,639** | **2,669,246** |
| 7 | Transportation Charges | 222,193 | 220,233 | 218,887 | 219,764 | 215,470 | 217,761 | 221,015 | 224,215 | 228,671 | 228,816 | 226,582 | 225,639 | 2,669,246 |
| 8 | **Panhandle Field TX OK** | **1,455,216** | **1,506,806** | **1,457,576** | **1,507,492** | **1,501,993** | **1,454,506** | **1,503,273** | **1,453,282** | **1,500,322** | **1,500,015** | **1,332,575** | **150,199** | **16,323,253** |
| 9 | Capacity Release | | | | | (1,302) | | (1,302) | | | | | | (2,604) |
| 10 | Transportation Charges | 1,455,216 | 1,506,806 | 1,457,576 | 1,507,492 | 1,503,295 | 1,454,506 | 1,504,575 | 1,453,282 | 1,500,322 | 1,500,015 | 1,332,575 | 150,199 | 16,325,857 |
| 11 | **Vector Chicago** | **42,971** | **38,336** | **36,570** | **39,482** | **36,042** | **38,083** | **42,583** | **85,166** | **87,586** | **76,506** | **90,391** | **85,821** | **699,538** |
| 12 | Capacity Release | | (4,247) | (6,013) | (3,101) | (6,541) | (4,500) | | | | (12,400) | | | (36,802) |
| 13 | Transportation Charges | 42,971 | 42,583 | 42,583 | 42,583 | 42,583 | 42,583 | 42,583 | 85,166 | 87,586 | 88,906 | 90,391 | 85,821 | 736,340 |
| 14 | **Viking Emerson** | **109,698** | **110,012** | **108,728** | **72,620** | **109,980** | **109,667** | **56,651** | **109,553** | **109,862** | **109,839** | **108,914** | **108,375** | **1,223,897** |
| 15 | Transportation Charges | 109,698 | 110,012 | 108,728 | 72,620 | 109,980 | 109,667 | 56,651 | 109,553 | 109,862 | 109,839 | 108,914 | 108,375 | 1,223,897 |
| 16 | **ANR Marshfield** | **128,036** | **128,294** | **127,241** | **128,296** | **128,267** | **128,011** | **127,179** | **120,639** | **128,148** | **128,134** | **127,376** | **126,936** | **1,526,556** |
| 17 | Transportation Charges | 128,036 | 128,294 | 127,241 | 128,296 | 128,267 | 128,011 | 127,179 | 120,639 | 128,148 | 128,134 | 127,376 | 126,936 | 1,526,556 |
| 18 | **NEXUS** | **1,839,375** | **1,779,400** | **1,732,500** | **1,790,250** | **1,790,250** | **1,732,500** | **1,790,250** | **1,698,765** | **1,770,255** | **1,790,250** | **1,617,000** | **1,607,761** | **20,938,556** |
| 19 | Capacity Release | | (10,850) | | | | | | (33,735) | (19,995) | | | | (64,580) |
| 20 | Transportation Charges | 1,839,375 | 1,790,250 | 1,732,500 | 1,790,250 | 1,790,250 | 1,732,500 | 1,790,250 | 1,732,500 | 1,790,250 | 1,790,250 | 1,617,000 | 1,607,761 | 21,003,136 |
| 21 | **AEP** | **1,100** | **1,100** | **1,100** | **1,100** | **1,100** | **1,100** | **1,100** | **1,100** | **1,100** | **1,100** | **7,738** | **1,100** | **19,838** |
| 22 | Transportation Charges | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 7,738 | 1,100 | 19,838 |
| 23 | **ANR ML-3** | | | | | | | | **299,469** | **279,729** | **338,108** | **286,916** | **338,108** | **1,542,328** |
| 24 | Capacity Release | | | | | | | | (15,000) | (34,880) | | (29,517) | | (79,397) |
| 25 | Transportation Charges | | | | | | | | 314,469 | 314,609 | 338,108 | 316,433 | 338,108 | 1,621,726 |
| 26 | **Physical Call Option Premium** | | | | | | | | | | **125,000** | **125,000** | | **250,000** |
| 27 | Transportation Charges | | | | | | | | | | 125,000 | 125,000 | | 250,000 |
| 28 | **Grand Total** | **5,006,730** | **4,992,935** | **4,874,317** | **4,953,446** | **4,976,681** | **4,872,870** | **4,915,034** | **5,183,277** | **5,298,626** | **5,492,120** | **5,108,420** | **3,855,655** | **59,530,111** |

DTE Gas Company
Cashout Summary by Production Month
April 2020-March 2021

Case No: U-20236
Witness: E.P. Schiffer
Exhibit No: A-6


| | | Interstate Receipts | Intrastate Payments | | | Intrastate Receipts | | | Total Cashouts Net Payment/(Receipt) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Line | Month | $/Dth | Volume (Dth) | Amount ($) | $/Dth | Volume (Dth) | Amount ($) | $/Dth | Volume (Dth) | Amount ($) |
| | | | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) | (col. h) |
| 1 | Apr-20 | $ - | 5,877 | $ 8,971 | $ 1.53 | (16,244) | $ (26,577) | $ 1.64 | (10,367) | (17,606) |
| 2 | May-20 | $ - | - | - | $ - | (38,981) | (73,765) | $ 1.89 | (38,981) | (73,765) |
| 3 | Jun-20 | $ - | 16,742 | 27,608 | $ 1.65 | (7,752) | (16,451) | $ 2.12 | 8,990 | 11,156 |
| 4 | Jul-20 | $ - | 35,222 | 48,586 | $ 1.38 | (5,146) | (9,611) | $ 1.87 | 30,076 | 38,975 |
| 5 | Aug-20 | $ - | 40,897 | 51,443 | $ 1.26 | (7,440) | (13,386) | $ 1.80 | 33,457 | 38,058 |
| 6 | Sep-20 | $ - | 9,998 | 18,414 | $ 1.84 | (5,932) | (12,872) | $ 2.17 | 4,066 | 5,542 |
| 7 | Oct-20 | $ - | 11,773 | 21,058 | $ 1.79 | (15,276) | (27,327) | $ 1.79 | (3,503) | (6,269) |
| 8 | Nov-20 | $ - | 3,067 | 2,449 | $ 0.80 | (4,245) | (10,172) | $ 2.40 | (1,178) | (7,723) |
| 9 | Dec-20 | $ - | 1,090 | 2,558 | $ 2.35 | (13,746) | (32,568) | $ 2.37 | (12,656) | (30,010) |
| 10 | Jan-21 | $ - | 259 | 619 | $ 2.39 | (20,538) | (50,255) | $ 2.45 | (20,279) | (49,636) |
| 11 | Feb-21 | $ - | 7,223 | 16,618 | $ 2.30 | (14,842) | (38,086) | $ 2.57 | (7,619) | (21,468) |
| 12 | Mar-21 | $ - | 1,290 | 5,112 | $ 3.96 | (7,059) | (30,429) | $ 4.31 | (5,769) | (25,316) |
| 13 | Subtotal | $ - | 133,438 | 203,437 | $ 1.52 | (157,201) | (341,499) | $ 2.17 | (23,763) | $ (138,062) |
| 14 | Prior Period Adjustments: | | | | | | | | | |
| 15 | Total Cashouts (Dth) | $ - | 133,438 | $ 203,437 | $ 1.52 | (157,201) | $ (341,499) | $ 2.17 | (23,763) | $ (138,062) |
| 16 | Btu Adjustment | | - | | | - | | | 1,508 | |
| 17 | Total Cashouts Mcf @ 14.65 | $ - | 133,438 | $ 203,437 | $ 1.52 | (157,201) | $ (341,499) | $ 2.17 | (22,255) | $ (138,062) |

| Line | Affiliate | Delivery Start | Delivery End | Volume (Dth) | Price $/Dth | Cost ($) | Price Method |
|---|---|---|---|---|---|---|---|
| | (col. a) | (col. b) | (col. c) | (col. d) | (col. e) | (col. f) | (col. g) |
| 1 | MichCon Gathering | 04/01/20 | 04/30/20 | 66,974 | $1.480 | 99,122 | MichCon city-gate monthly index |
| 2 | DTE Energy Trading | 04/01/20 | 04/30/20 | 381,000 | $2.035 | 775,335 | Fixed Price |
| 3 | MichCon Gathering | 05/01/20 | 05/31/20 | 103,812 | $1.780 | 184,785 | MichCon city-gate monthly index |
| 4 | DTE Energy Trading | 05/01/20 | 04/30/20 | 393,700 | $2.035 | 801,180 | Fixed Price |
| 5 | MichCon Gathering | 06/01/20 | 06/30/20 | 90,512 | $1.600 | 144,819 | MichCon city-gate monthly index |
| 6 | DTE Energy Trading | 06/01/20 | 06/30/20 | 381,000 | $2.035 | 775,335 | Fixed Price |
| 7 | MichCon Gathering | 07/01/20 | 07/31/20 | 95,364 | $1.440 | 137,324 | MichCon city-gate monthly index |
| 8 | DTE Energy Trading | 07/01/20 | 07/31/20 | 381,502 | $2.035 | 776,357 | Fixed Price |
| 9 | MichCon Gathering | 08/01/20 | 08/31/20 | 47,120 | $1.700 | 80,104 | MichCon city-gate monthly index |
| 10 | DTE Energy Trading | 08/01/20 | 08/31/20 | 393,700 | $2.035 | 801,180 | Fixed Price |
| 11 | MichCon Gathering | 09/01/20 | 09/30/20 | 114,954 | $2.200 | 252,899 | MichCon city-gate monthly index |
| 12 | DTE Energy Trading | 09/01/20 | 09/30/20 | 376,213 | $2.035 | 765,593 | Fixed Price |
| 13 | DTE Energy Trading | 09/16/20 | 09/16/20 | 1,681 | $3.150 | 5,295 | MichCon city-gate GDD |
| 14 | DTE Energy Trading | 09/18/20 | 09/20/20 | 3,106 | $2.650 | 8,231 | MichCon city-gate GDD |
| 15 | MichCon Gathering | 10/01/20 | 10/31/20 | 100,787 | $1.820 | 183,432 | MichCon city-gate monthly index |
| 16 | DTE Energy Trading | 10/01/20 | 10/31/20 | 393,700 | $2.035 | 801,180 | Fixed Price |
| 17 | MichCon Gathering | 11/01/20 | 11/30/20 | 76,850 | $2.680 | 205,958 | MichCon city-gate monthly index |
| 18 | DTE Energy Trading | 11/01/20 | 11/30/20 | 39,000 | $1.650 | 64,350 | NEXUS Clarington |
| 19 | MichCon Gathering | 12/01/20 | 12/31/20 | 107,401 | $2.610 | 280,317 | MichCon city-gate monthly index |
| 20 | DTE Energy Trading | 12/01/20 | 12/31/20 | 310,000 | $2.616 | 810,960 | NEXUS Kensington |
| 21 | MichCon Gathering | 01/01/21 | 01/31/21 | 99,246 | $2.300 | 228,266 | MichCon city-gate monthly index |
| 22 | DTE Energy Trading | 01/01/21 | 01/31/21 | 40,300 | $2.029 | 81,769 | NEXUS Clarington |
| 23 | MichCon Gathering | 02/01/21 | 02/28/21 | 83,454 | $2.590 | 216,146 | MichCon city-gate monthly index |
| 24 | DTE Energy Trading | 02/01/21 | 02/28/21 | 36,400 | $2.489 | 90,600 | NEXUS Clarington |
| 25 | DTE Energy Trading | 02/01/21 | 02/28/21 | 1,061,200 | $2.645 | 2,806,874 | NEXUS Kensington |
| 26 | MichCon Gathering | 03/01/21 | 03/31/21 | 105,618 | $2.730 | 288,337 | MichCon city-gate monthly index |
| 27 | DTE Energy Trading | 03/01/21 | 03/31/21 | 1,174,900 | $2.744 | 3,223,926 | NEXUS Kensington |
| 28 | Total (Dth) | | | 6,459,494 | $2.305 | $ 14,889,671 | |

[redacted]

**DTE**

DTE Michigan Gathering Holding Company
1 Energy Plz
DETROIT MI 48226-1221
USA

**Bill-To Number: 1021067**

[redacted]

**Ship-To Party: 1021067**

[redacted]

**Information**

| | |
|---|---|
| **Invoice Number:** | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| **Payment Terms:** | Net 10Days |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| **Total Due:** | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| Item | Material Description | Plant | Quantity UOM | | Unit Price | Net Amount |
|---|---|---|---|---|---|---|
| 10 | Receipt Point Fee 40101 | 2800 | 1 | EA | $800.00/1 EA | $800.00 |
| | | | | | [redacted] | [redacted] |

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

DTE

DTE Michigan Gathering Holding
Company
1 Energy Plz
DETROIT MI 48226-1221
USA

[redacted]

**Bill-To Number: 1003169**

[redacted]

**Ship-To Party: 1003169**

[redacted]

**Information**

| | |
|---|---|
| **Invoice Number:** | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| **Payment Terms:** | Net 10Days |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| **Total Due:** | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| Item | Material Description | Plant | Quantity | UOM | Unit Price | Net Amount |
|---|---|---|---|---|---|---|
| 10 | Receipt Point Fee 41004 | 2445 | 1 | EA | $900.00/1 EA | $900.00 |
| | | | | | [redacted] | [redacted] |

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

**DTE**

DTE Michigan Gathering Holding Company
1 Energy Plz
DETROIT MI 48226-1221
USA

[redacted]

**Bill-To Number: 1002453**

[redacted]

**Ship-To Party: 1002453**

[redacted]

**Information**

| | |
|---|---|
| **Invoice Number:** | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| **Payment Terms:** | Net 10Days |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| **Total Due:** | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| Item | Material Description | Plant | Quantity UOM | Unit Price | Net Amount |
|---|---|---|---|---|---|
| 10 | Receipt Point Fee 41026 | 2445 | 1 EA | $2,934.00/1 EA | $2,934.00 |

2 Locations at $900 each, one at $600, one at $534 [redacted] [redacted]

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

[redacted]

**DTE**

DTE Michigan Gathering Holding Company
1 Energy Plz
DETROIT MI 48226-1221
USA

**Bill-To Number: 1020256**

[redacted]

**Ship-To Party: 1020256**

[redacted]

**Information**

| | |
|---|---|
| [redacted] | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| [redacted] | [redacted] |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| [redacted] | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| Item | Material Description | Plant | Quantity | UOM | Unit Price | Net Amount |
|---|---|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| 60 | Receipt Point Fee 40105 | 2800 | 1 | EA | $450.00/1 EA | $450.00 |
| | 2 Receipt points at $225 each | | | | [redacted] | [redacted] |

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

[redacted]

**DTE**

DTE Michigan Gathering Holding Company
1 Energy Plz
DETROIT MI 48226-1221
USA

**Bill-To Number: 1006557**

[redacted]

**Ship-To Party: 1006557**

[redacted]

**Information**

| | |
|---|---|
| **Invoice Number:** | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| **Payment Terms:** | Net 10Days |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| **Total Due:** | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| Item | Material/Description | Plant | Quantity | UOM | Unit Price | Net Amount |
|---|---|---|---|---|---|---|
| 10 | Receipt Point Fee 40073 | 2800 | 1 | EA | $225.00/1 EA | $225.00 |
| | | | | | [redacted] | [redacted] |

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

**DTE**

DTE Michigan Gathering Holding Company
1 Energy Plz
DETROIT MI 48226-1221
USA

[redacted]

**Bill-To Number: 1000048**

[redacted]

**Ship-To Party: 1000048**

[redacted]

**Information**

| | |
|---|---|
| **Invoice Number:** | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| **Payment Terms:** | Net 10Days |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| **Total Due:** | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| Item | Material Description | Plant | Quantity | UOM | Unit Price | Net Amount |
|---|---|---|---|---|---|---|
| 10 | Receipt Point Fee 40076 | 2800 | 1 | EA | $450.00/1 EA | $450.00 |
| | 2 meters at $225 each | | | | [redacted] | [redacted] |

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

[redacted]

**DTE**

DTE Michigan Gathering Holding Company
1 Energy Plz
DETROIT MI 48226-1221
USA

**Bill-To Number: 1002617**

[redacted]

**Ship-To Party: 1002617**

[redacted]

**Information**

| | |
|---|---|
| **Invoice Number:** | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| **Payment Terms:** | Net 10Days |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| **Total Due:** | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| [illegible] | [illegible] | [illegible] | Quantity | UOM | Unit Price | Net Amount |
|---|---|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| 20 | Receipt Point Fee 40086 | 2800 | 1 | EA | $225.00/1 EA | $225.00 |
| | | | | | [redacted] | [redacted] |

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

[redacted]

**DTE**

DTE Michigan Gathering Holding
Company
1 Energy Plz
DETROIT MI 48226-1221
USA

| Bill-To Number: 1032929 |
|---|
| [redacted] |

| Ship-To Party: 1032929 |
|---|
| [redacted] |

| Information | |
|---|---|
| **Invoice Number:** | [redacted] |
| **Invoice Date:** | June 20, 2020 |
| **Transaction Date:** | June 19, 2020 |
| **Payment Terms:** | Net 10Days |
| **Customer Ref Number:** | May 2020 Production |
| **Due Date:** | June 30, 2020 |
| **Total Due:** | [redacted] |

**Payment Options**

- Mail check payments using the coupon attached
- Wire Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]
- ACH Instructions: Send the Invoice Number, company name of DTE MI Gathering Hldg Co and the bank name of [redacted]

| Item | Material Description | Plant | Quantity | UOM | Unit Price | Net Amount |
|---|---|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| 40 | Receipt Point Fee 40103 | 2800 | 1 | EA | $2,700.00/1 EA | $2,700.00 |
| | 12 receipt points at $225 | | | | [redacted] | [redacted] |

**Additional Information:**

- Please make any inquiries regarding this bill before the due date
- Please have your invoice number and Bill-To number available when calling about your bill.

S T A T E O F M I C H I G A N

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

* * * * *

| | | |
|---|---|---|
| In the matter of the application of<br>**DTE MICHIGAN GATHERING COMPANY**<br>requesting *ex parte* approval of new rates for<br>transporting gas on the Antrim Expansion Pipeline. | )<br>)<br>)<br>)<br>) | Case No. U-17530 |

At the March 6, 2014 meeting of the Michigan Public Service Commission in Lansing, Michigan.

PRESENT: Hon. John D. Quackenbush, Chairman
Hon. Greg R. White, Commissioner
Hon. Sally A. Talberg, Commissioner

**ORDER**

On December 23, 2013, DTE Michigan Gathering Company (DTEMG) filed an application for *ex parte* approval of a new gas transportation agreement for all shippers transporting natural gas on the Antrim Expansion Pipeline (AEP). DTEMG states that all shippers on the AEP have agreed to the new gas transportation agreement and that no other customer's rates or charges will increase as a result of the approval of this application.

Currently, DTEMG provides gas transportation services on the AEP to producers pursuant to rates approved in the July 11, 2001 order in Case No. U-12342. In that order, the Commission established a $0.05104 per thousand cubic feet (Mcf) rate, which incorporates the net revenues from AEP receipt point meters that are an integral part of the overall AEP transportation system, miscellaneous revenues that the Commission determined were related to the AEP, and a unit of production depreciation rate of $0.01666 per Mcf.

According to DTEMG, during 2013 a number of AEP shippers approached DTEMG seeking a review of the transportation rates charged on the AEP. As a result of these requests and after review of its transportation rate, DTEMG offered to provide transportation service on the AEP to all shippers pursuant to the rates and terms of a new transportation agreement. The new agreement, which is included with this order as Attachment 1, provides a reduction in the transportation rate from \$0.05104 per Mcf to \$0.035 per Mcf, a reduction in the unit of production depreciation rate from \$0.01666 per Mcf to \$0.0029 per Mcf, and a reduction in the AEP receipt point charges from a range of \$450-\$600 per month to \$225 per month for all AEP receipt points. DTEMG contends that the agreement reduces the transportation rate to better reflect the future production and expected natural gas volumes that will be transported on the AEP, reduces the unit of production depreciation rates to more appropriately correspond to the anticipated useful life of the AEP, and reduces the receipt point rate to a single uniform rate for all AEP receipt points, a modification that was suggested by various AEP shippers.

DTEMG attests in its application that all current shippers have agreed to the new rates and have executed a new agreement identical to Attachment 1. Further, DTEMG states that once the agreement is approved, the new lower rates in that agreement will become effective and be applied to all volumes transported beginning July 1, 2013, for all shippers who executed the new agreement before August 31, 2013, or the first day of the month after execution for all other shippers. Regardless of the date upon which the new rates become effective for each shipper the new agreements will all terminate on June 30, 2020.

The Commission Staff (Staff) has completed its review of DTEMG's application. Based on its analysis of DTEMG's proposals, the Staff has indicated that it supports *ex parte* approval of the company's application.

The Commission finds that the new agreement is reasonable and in the public interest, and should be approved. Further, the Commission concurs with the Staff and finds that because the proposed agreement will not increase the cost of service to customers, *ex parte* approval is appropriate. In reaching its conclusion that the contract should be approved, the Commission finds, in the absence of a reason to believe otherwise, that the parties to the contract protected their own interests and reached a mutually beneficial agreement.

The Commission further finds that other customers and the public interest are adequately protected without the need for a hearing.

THEREFORE, IT IS ORDERED, that DTE Michigan Gathering Company's request to implement a new gas transportation agreement with all shippers on the Antrim Expansion Pipeline as set forth in Attachment 1 is approved.

The Commission reserves jurisdiction and may issue further orders as necessary.

Any party desiring to appeal this order must do so in the appropriate court within 30 days after issuance and notice of this order, under MCL 462.26.

MICHIGAN PUBLIC SERVICE COMMISSION

John D. Quackenbush, Chairman

By its action of March 6, 2014.

Greg R. White, Commissioner

Mary Jo Kunkle, Executive Secretary

Sally A. Talberg, Commissioner

# Attachment 1

**ASAT: __________**

# GAS TRANSPORTATION AGREEMENT

**DTE MICHIGAN GATHERING COMPANY AND**

**[Insert Shipper]**

**Dated [______________]**

# GAS TRANSPORTATION AGREEMENT

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**SCHEDULE OF EXHIBITS**

| **EXHIBIT** | **SUBJECT** |
|---|---|
| A. | RECEIPT POINTS |
| B. | DELIVERY POINTS |
| C. | GAS TRANSPORTATION TERMS |
| | I. Service Requests<br>II. Nominations, Scheduling and Allocations<br>III. Paper Pooling<br>IV. Imbalances<br>V. Measurement<br>VI. Quality Specifications<br>VII. Diversion of Gas<br>VIII. Oxygen Content |
| D. | ANTRIM OXYGEN PROCEDURES |

# DTE MICHIGAN GATHERING COMPANY
# GAS TRANSPORTATION AGREEMENT

**THIS AGREEMENT** is entered into as of this ___ day of _______, 2013, ("Effective Date") by and between ________________________("Shipper"), having an office at ______________________________ and DTE MICHIGAN GATHERING COMPANY ("DTE Gathering"), having its principal offices at One Energy Plaza, Detroit, Michigan 48226. Shipper and DTE Gathering may be referred to collectively as "Parties" and individually as "Party".

RECITALS

**WHEREAS** Shipper has requested that DTE Gathering transport Gas on Shipper's behalf;

**WHEREAS** Shipper and DTE Gathering have mutually agreed to adjust the rate and other terms as identified in this Agreement; and

**WHEREAS** DTE Gathering is willing to provide the requested transportation service subject to the terms and conditions contained in this Agreement;

**NOW, THEREFORE,** in consideration of the mutual promises, agreements and undertakings in this Agreement, Shipper and DTE Gathering agree as follows:

## ARTICLE I

## DEFINITIONS

1.1. "Agreement" means this Gas Transportation Agreement together with Exhibit A – Receipt Points ("Exhibit A"), Exhibit B- Delivery Points ("Exhibit B"), Exhibit C- Gas Transportation Terms ("Exhibit C"), and Exhibit D- Antrim Oxygen Procedures ("Exhibit D").

1.2. "Antrim Gas" means natural gas produced from the Antrim shale formation.

1.3. "Antrim Expansion Project" or "AEP" means the pipeline expansion project as filed by DTE Gathering in the Michigan Public Service Commission Case No. U-10547, which includes (i) the utilization of a portion of DTE Lateral's Northern Michigan Wet Header gathering system for purposes of providing transportation, and (ii) transportation on the DTE Lateral lateral pipelines.

1.4. "Btu" means British Thermal Unit, which is the quantity of heat necessary to raise one pound of water one degree Fahrenheit and is exactly equal to 1055.056 joules.

1.5. "Capital Repair Threshold" shall have the meaning as defined in Section 5.1.3.

1.6. "$CO_2$" means carbon dioxide.

1.7. "Commission" or "MPSC" means the Michigan Public Service Commission or any successor thereto.

1.8. "Cubic Feet of Gas" means that quantity of Gas which occupies one cubic foot at a temperature of 60 degrees Fahrenheit and at a pressure of 14.65 Psia.

1.9. "Gas Day" means a period of 24 consecutive hours beginning at 10:00 AM Eastern Time (Standard or Daylight Savings) of one calendar day and ending at 10:00 AM Eastern Time (Standard or Daylight Savings) on the next following calendar day. The reference date for any day shall be that of its beginning.

1.10. "Delivery Point(s)" means the points set forth on Exhibit B, attached hereto, at which DTE Gathering shall redeliver Equivalent Quantities of Gas to Shipper.

1.11. "DTE Gas" means DTE Gas Company.

1.12. "DTE Lateral" means DTE Michigan Lateral Company.

1.13. "eNominator" means DTE Gas's electronic gas nomination system or any successor program used to perform nominations of gas flows.

1.14. "Equivalent Quantity(ies)" means the volume of Gas delivered by or for the account of Shipper to DTE Gathering on any day pursuant to this Agreement multiplied by a fraction, the numerator of which is the average heating value per Mcf of the Gas delivered or caused to be delivered by Shipper at a pressure base of 14.65 psia and the denominator of which is the average heating value per Mcf at a pressure base of 14.65 psia of the Gas redelivered on the same day by DTE Gathering, less any amount withheld by DTE Gathering for Gas-in-Kind and Shrink.

1.15. "Excess Major Capital Repair Cost Amount" shall have the meaning given in Section 5.1.3.

1.16. "Gas" means Antrim Gas and all other gas delivered for transportation services under this Agreement.

1.17. "Gas-in-Kind" means 0.12% of all quantities of Gas delivered by Shipper on the AEP, unless otherwise modified by the MPSC.

1.18. "Gas Transportation Charge" means the currently effective transportation rate on the AEP as identified in Article V.

1.19. "Gas Transportation Service" means transportation service provided by DTE Gathering on the AEP for Shipper on a daily basis pursuant to the terms and conditions set forth in this Agreement.

1.20. "Lateral Charge" means the rate for transportation of Gas on DTE Lateral's lateral pipelines.

1.21. "Major Capital Repair Costs" means costs and expenses actually and reasonably incurred by DTE Gathering related solely to capital repairs to pipelines, fixtures, appurtenances, and equipment that are necessary for the continuous and safe operation of the AEP; provided, however that inspection and diagnostic costs, including without limitation costs of running a smart pig, are excluded from Major Capital Repair Costs as defined herein.

1.22. "Mcf" means 1,000 Cubic Feet of Gas at a pressure base of 14.65 psia.

1.23. "MMBtu" means one million Btu.

1.24. "Month" means the period commencing on the first Gas Day of a calendar month and extending until commencement of the first Gas Day of the next following calendar month.

1.25. "Overrun Charge" shall have the meaning as defined in Section 5.1.5.

1.26. "Prime Rate" means the rate announced by JP Morgan Chase Bank (or its successor) from time to time as its prime commercial lending rate, or if the prime rate is discontinued, the rate announced from time to time as that being charged to its most creditworthy commercial borrowers for ninety (90) day unsecured loans.

1.27. "Receipt Point(s)" means the points set forth on Exhibit A, attached hereto, at which Shipper may deliver Gas to DTE Gathering.

1.28. "Shrink" means the measured volumetric and Btu reduction for removal of $CO_2$ to meet the requirements of the Gas Quality Specifications in Section VI of Exhibit C for transportation of the Gas, and Shippers proportionate share shall be determined by the ratio that the Shipper's calculated $CO_2$ bears to the total of all shippers' calculated $CO_2$.

1.29. "Surcharge Volume" means the total volume of gas transported on the AEP for the twelve (12) month period ending on the last day of the month prior to the date that the total aggregate Major Capital Repair Costs incurred exceed $400,000.

1.30. "Transportation Surcharge" shall have the meaning defined in Section 5.1.3.

1.31. "Unauthorized Overrun Gas" shall have the meaning as defined in Section 5.1.5.

## ARTICLE II

## DEDICATION OF RESERVES

2.1 Before any Antrim Gas is transported on a firm basis pursuant to this Agreement, the party who owns or controls the acreage from which the Antrim Gas is produced shall dedicate all previously undedicated Antrim Gas reserves which it owns and controls, and which can be reasonably serviced by the AEP. Antrim Gas which is produced from controlled acreage or acreage acquired after execution of this Agreement (unless previously otherwise dedicated) must also first be dedicated to the AEP before it will be transported on a firm basis. Such dedications must be made on a form provided or approved by DTE Gathering. DTE Gathering may refuse firm service for any Antrim Gas which has not been dedicated as provided above.

## ARTICLE III

## TERM

3.1 All terms and conditions of this Agreement are effective once the form is approved by the Commission. The effective date will be July 1, 2013 if executed prior to August 31, 2013. Execution of the Agreement after August 31, 2013 will result in the Agreement becoming effective on the first day of the month after it is executed. In either case, the Agreement will continue through June 30, 2020. This Agreement will continue in effect from year to year thereafter until terminated by either Party giving written notice to the other at least ninety (90) days prior to the next anniversary date.

**ARTICLE IV**

**GAS TRANSPORTATION**

4.1 Shipper shall deliver or cause to be delivered to DTE Gathering at the Receipt Points, Gas for Gas Transportation Service up to a maximum daily quantity ("MDQ") of _________Mcf. DTE Gathering shall provide Gas Transportation Service for Shipper or for the account of Shipper and shall redeliver an Equivalent Quantity of Gas at the Delivery Points nominated pursuant to this Agreement. Gas Transportation Service shall be provided in accordance with Exhibit C, Section I.A.

4.2 DTE Gathering shall retain Gas-in-Kind provided, however, that if the Delivery Point for Shipper's Gas is into DTE Gas's transmission and distribution pipeline system, then the Gas-in-Kind shall be borne by DTE Gas or the downstream shipper. Gas-in-Kind and Shrink will be calculated and withheld from the quantity of Gas that is redelivered for the account of Shipper at each Delivery Point, based on the nominated volume of Gas at the Delivery Point.

**ARTICLE V**

**RATES**

5.1 Shipper shall pay DTE Gathering a Monthly amount for transportation as follows:

5.1.1 A Monthly Customer Administrative Charge of $300 for each Agreement Shipper and DTE Gathering execute for transportation service.

5.1.2 A basic charge equal to the volumes of Gas in Mcf units received by DTE Gathering from Shipper at the Receipt Points and transported for or on behalf of Shipper during the Month, multiplied by the Gas Transportation Charge, which shall be $0.035/Mcf which includes a depreciation rate of $0.0029/Mcf.

5.1.3 If at any time after the Effective Date the total aggregate Major Capital Repair Costs incurred exceed $400,000, DTE Gathering shall be entitled to charge a Transportation Surcharge The amount of the Transportation Surcharge shall be calculated by multiplying the total aggregate Major Capital Repair Costs incurred during the Settlement Term in excess of $400,000 (the "Excess Major Capital Repair Cost Amount") by twenty percent (20%), and dividing that result by the Surcharge Volume; provided, however that in no event shall the amount of the Transportation Surcharge ever exceed $0.005 per Mcf ("Capital Repair Threshold"). The Parties agree that the Transportation Surcharge may be subject to periodic recalculation if additional Major Capital Repair Costs are incurred, subject to the Capital Repair Threshold. Book depreciation of the capital expenditures occurring on or after the effective date of this Agreement shall be at a fixed thirty (30) year rate.

Notwithstanding the foregoing, DTE Gathering is not required to make any capital investment in facilities under this Section that it determines would result in an increase in the rate of more than $0.005/Mcf at any time.

5.1.4 A charge for transportation on DTE Lateral's lateral pipelines equal to the quantities of Gas transported on the lateral pipelines multiplied by the Lateral Charge.

5.1.5 An Overrun Charge, for any amounts that exceed Shipper's MDQ on any Gas Day ("Unauthorized Overrun Gas"), equal to the sum of $3.20 per Mcf multiplied by such Unauthorized Overrun Gas; provided, however, no Overrun Charge will be charged under the following circumstances:

a. in any Month where Shipper, after meeting the criteria set forth in 5.1.6 delivers Gas in excess of its MDQ ("Authorized Overrun Gas");

b. in any Month where the daily quantities in excess of the MDQ averages no more than five percent (5%) above the MDQ plus any Authorized Overrun Gas; or

c. in circumstances where Gas delivered in excess of the MDQ occurred temporarily for less than a 24-hour period and resulted from an inadvertent surge or increase of Gas from Shipper's facilities due to equipment failure. However, only one such failure will be allowed during any calendar Month. Shipper shall promptly notify DTE Gathering within two (2) business days of the occurrence under this provision or it shall be considered Unauthorized Overrun Gas.

5.1.6 Shipper may deliver to DTE Gathering Authorized Overrun Gas if Shipper has obtained DTE Gathering's written permission to flow Gas in excess of Shipper's MDQ prior to submitting a nomination. Permission to flow Authorized Overrun Gas will be granted unless the AEP is transporting firm Gas at the currently existing pipeline capacity.

5.1.7 If DTE Gathering is not able to transport Shipper's nominated quantity of Gas up to Shipper's MDQ due to Unauthorized Overrun Gas on the system, Shipper shall receive, on a calendar year quarterly basis, its proportionate share of 80% of the actual funds DTE Gathering collects as Overrun Charges from all Shippers. Shipper's proportionate share will be an amount equal to Shipper's quantity of Gas, up to its MDQ, that did not flow during the calendar quarter as a result of Unauthorized Overrun Gas divided by the total quantity of Gas that did not flow on the AEP because of Unauthorized Overrun Gas during the calendar quarter.

5.2 All charges set forth in this Article V, except the Monthly Customer Administrative Charge, will be applied to quantities in units of Mcf delivered at the Receipt Point as measured in accordance with the terms of Exhibit C, Section V.

**ARTICLE VI**

**NOMINATIONS, DELIVERIES**

6.1 Shipper must nominate all quantities of Gas that will be transported pursuant to this Agreement and as further detailed in Exhibit C, Section II.

**ARTICLE VII**

**RECEIPT POINT(S)**

7.1 Shipper shall deliver or cause to be delivered Gas at the Receipt Point(s). All Gas delivered to DTE Gathering must meet the quality specification set out in Exhibit C, Section VI.

7.2 DTE Gathering, at its sole discretion, may refuse to accept Gas at any Receipt Point(s) that is not subject to an executed Receipt Point Agreement between DTE Gathering and the party responsible for the Receipt Point.

7.3 DTE Gathering agrees that the Receipt Point fees under its Antrim Receipt Point Agreement(s) ("Receipt Point Agreement") for deliveries into the AEP shall be $225 on a monthly basis from the Effective Date of this Agreement. The Parties further acknowledge that the Receipt Points are an integral part of the AEP and will continue to be operated by DTE Gathering. In the event of a conflict between this Agreement and the Receipt Point Agreement relating solely to the monthly fee, this Agreement shall control.

## ARTICLE VIII

## DELIVERY POINT(S)

8.1 For all Gas delivered by Shipper to DTE Gathering at the Receipt Points, DTE Gathering shall redeliver to Shipper, or for the account of Shipper, Equivalent Quantities of Gas at the Delivery Point(s).

## ARTICLE IX

## DISPOSITION OF GAS

9.1 Because of the inability of DTE Gathering and Shipper to maintain precise control over the rate of flow and quantities of Gas to be received and delivered, the Parties shall exercise reasonable efforts to keep Gas receipts and deliveries in balance. DTE Gathering will use Electronic Gas Measurement ("EGM") for any Receipt Point under this Agreement.

9.2 DTE Gathering may commingle Gas delivered under this Agreement with Gas owned by DTE Gathering and/or transported by DTE Gathering for others if the resulting commingled gas stream meets the Delivery Point quality specifications in Exhibit C or any quality specifications subsequently authorized by the MPSC.

## ARTICLE X

## POSSESSION, INDEMNITY AND LIMITATION ON LIABILITY

10.1 As between the Parties, Shipper is deemed to be in exclusive control and possession of the Gas transported under this Agreement and is responsible and shall defend, hold harmless and indemnify DTE Gathering for any damage or injury caused thereby until the Gas is delivered by Shipper to DTE Gathering at the interconnection with the Antrim Expansion Project and after it is redelivered by DTE Gathering at the Delivery Point(s). Except for Shipper's indemnity obligation as provided in Sections II.C. and VI.(k) of Exhibit C, DTE Gathering is deemed to be in exclusive control and possession of the Gas and responsible and shall defend, hold harmless and indemnify Shipper for any damage or injury caused thereby after it is delivered to DTE Gathering, by Shipper or for Shipper's account, at the interconnection with the Antrim Expansion Project, and before it is redelivered by DTE Gathering at the Delivery Point(s).

10.2 Neither Party shall be liable to the other for consequential incidental, exemplary, punitive or indirect damages arising out of the performance or non-performance of any obligation under this Agreement, by statute, in tort or contract, under any indemnity provision or otherwise.

**ARTICLE XI**

**DELIVERY PRESSURE**

11.1 DTE Gathering has no obligation to receive Gas at Receipt Points from Shipper unless such Gas is delivered at sufficient pressure to meet DTE Gathering's prevailing line pressure, but not to exceed DTE Gathering’s maximum allowable operating pressure (“MAOP”) or that of any third party pipeline into which such Receipt Point interconnects. Shipper has no obligation to receive quantities of Gas, or cause quantities of Gas to be received by a third party transporter under this Agreement, unless such Gas is delivered at pressures set forth in Exhibit B for each Delivery Point. DTE Gathering has no obligation to compress the Gas it transports in order to redeliver such Gas at the Delivery Point.

**ARTICLE XII**

**WARRANTY OF RIGHT TO DELIVER**

12.1 Shipper warrants that at the time of delivery it has the right to deliver the Gas to DTE Gathering at the Receipt Point(s) and shall indemnify, defend, and save DTE Gathering harmless from suits, actions, debts, accounts, damages, costs, losses and expenses arising from or out of claims of any and all persons to the Gas or to royalties, taxes, license fees or charges thereon.

**ARTICLE XIII**

**TAXES**

13.1 Shipper shall pay all taxes, tariffs, and duties however designated, levied, or charged resulting from services provided under this Agreement, including, without limitation, all state and local privilege or excise taxes, and any amount in lieu of such taxes, tariffs and duties paid or payable by DTE Gathering, exclusive however of taxes based on the income of DTE Gathering and property taxes. Shipper shall reimburse DTE Gathering for any such taxes, tariffs and duties which are collected and remitted or paid on Shipper's behalf by DTE Gathering because of Shipper's failure to pay.

**ARTICLE XIV**

**BILLING AND PAYMENT**

14.1 On or before the twentieth (20th) day of each calendar Month, DTE Gathering will render a statement and supporting documentation to Shipper based on the applicable charges set forth in Section 5.1 for the previous calendar Month. Shipper shall tender payment to DTE Gathering for the amount billed in the statement on or before the later of (i) the 25th day of the Month in which the statement was received or (ii) ten (10) days after receipt of the statement. All payments must be made by wire transfer directed to a bank account designated by DTE Gathering.

14.2 The statements rendered pursuant to this Agreement will be denominated in U.S. Dollars ($U.S.), and all payments must be made in $U.S.

14.3 Shipper has the right at all reasonable times to examine the books and records of DTE Gathering to the extent necessary to verify the accuracy of any statement, charge or computation made under or pursuant to any provisions of this Agreement.

14.4 Shipper shall notify DTE Gathering of any disputed amount in any statement and provide a reasonable basis for such dispute, so that reasonable efforts may be made to resolve the dispute as quickly as possible.

14.5 If Shipper fails to pay any amount in any statement rendered by DTE Gathering that is not in dispute when such amount is due, unless otherwise agreed by Shipper and DTE Gathering, interest will accrue on the unpaid, undisputed amount at a rate equal to the Prime Rate from the due date until the date of payment. If any disputed amount is not resolved within forty-five (45) days of the due date for such statement, interest will accrue on the unpaid disputed amount at a rate equal to the Prime Rate from the due date until the date of payment.

14.6 If either DTE Gathering or Shipper discovers any error or inaccuracy in invoices, statements, billings, payment, calculations or determinations under this Agreement, then proper adjustment and correction thereof will be made as promptly as practicable. If errors or inaccuracies are not identified by either Shipper or DTE Gathering and reported to the other Party within twenty-four (24) Months from the date of such invoices, statements, billings, payments, calculations, or determinations, the same are deemed conclusively to be correct.

14.7 If Shipper fails to pay the undisputed amount of any invoice when it is due, DTE Gathering may, after ten (10) days prior notice, suspend transportation services to Shipper until such amount is paid.

## ARTICLE XV

## NON-WAIVER OF FUTURE DEFAULTS

15.1 No waiver by either Party of any one or more defaults by the other in the performance of any provision of this Agreement will operate or be construed as a waiver of any future default or defaults, whether of a like or a different character.

## ARTICLE XVI

## FORCE MAJEURE

16.1 Neither Shipper nor DTE Gathering will be liable in damages, or in any other remedy, legal or equitable, to the other for failure to perform obligations under this Agreement due to any force majeure event, which is defined as any act, omission or circumstances occasioned by or in consequence of any acts of God, strikes, lockouts, acts of the public enemy, wars, sabotage, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, arrests, restraints of rulers and peoples, civil disturbances, explosions, breakage or accident to machinery, lines of pipe, wells, flowlines, production facilities or related equipment, or $CO_2$ treating plants or the necessity to make unscheduled shutdowns (for purposes of necessary maintenance, repairs, tests, or alterations to machinery, lines of pipe or $CO_2$ treating plants), well or line freezeups, the binding order of any court or governmental authority which has been resisted in good faith by all reasonable legal means, or any other cause, whether of the kind herein enumerated, or otherwise, not within the control of the party claiming force majeure, and which by the exercise of due diligence such party is unable to prevent or overcome. A failure to settle or prevent any strike or other controversy with employees or with anyone purporting or seeking to represent employees shall not be considered to be a matter within the control of the party claiming force majeure.

16.2 Any force majeure event affecting the performance of this Agreement by either Party, however, will not relieve such party of liability (i) in the event of its continuing negligence; (ii) in the event of its failure to use due diligence to remedy the event of force majeure and to remove the cause of such force majeure in an adequate manner and with all reasonable dispatch or (iii) from its obligations to make payments of amounts then due thereunder, unless such party gives notice and full particulars of the same in writing or by telecopy to the other party as soon as possible after the occurrence relied on.

## ARTICLE XVII

## LAWS, ORDERS, RULES AND REGULATIONS

17.1 The performance by the Parties of their obligations set forth in this Agreement shall be subject to all valid and applicable laws, orders, rules and regulations of any duly constituted authority having jurisdiction.

17.2 Authority for Gas Transportation Service under this Agreement is provided pursuant to 1929 PA 9, as amended (Act 9); MCL 483.101 et seq.

17.3 The Parties agree that the rates identified in Article 5 of this Agreement shall remain in effect for a period of seven (7) years from the Effective Date. Without limiting the foregoing, neither Party shall seek or impose any rate adjustment or other charge or requirement in any way inconsistent with the terms and conditions of this Agreement until seven (7) years from the Effective Date or the Parties mutually agree to modify or amend those terms and conditions in a written amendment.

17.4 THIS AGREEMENT IS GOVERNED BY THE LAW OF THE STATE OF MICHIGAN. IT IS AGREED THAT ANY AND ALL LITIGATION RELATED TO THIS AGREEMENT MUST BE BROUGHT IN EITHER A STATE OR FEDERAL COURT

LOCATED IN WAYNE COUNTY, MICHIGAN, AND EACH PARTY, FOR PURPOSES OF ANY SUCH LITIGATION, SUBMITS TO THE EXCLUSIVE JURISDICTION AND VENUE OF THAT COURT.

## ARTICLE XVIII

## NOTICE

18.1 Unless otherwise provided herein, all notices given hereunder by one Party to the other shall be sent to the addresses provided below by registered mail, overnight mail or by facsimile transmission and shall be effective upon receipt thereof. However, routine communications, including monthly statements, will be considered as duly delivered when mailed by either registered, overnight or ordinary mail.

SHIPPER:

Attn:
Fax:

DTE GATHERING:

DTE Michigan Gathering Company
One Energy Plaza 2084 WCB
Detroit, Michigan 48226
Attn: Manager Midstream Business Development
Fax: (313) 235-6450

18.2 Each Party may, by prior written notice to the other, change its address or addresses given above at any time.

## ARTICLE XIX

## CREDITWORTHINESS

19.1 Shipper shall demonstrate creditworthiness at the time of its request for service and, upon DTE Gathering's request at any time thereafter, if DTE Gathering has reasonable grounds for insecurity regarding the Shipper's performance under this Agreement, Shipper shall demonstrate creditworthiness. DTE Gathering is not required to commence service or to continue to provide service if Shipper, when requested by DTE Gathering to demonstrate creditworthiness, fails to do so to DTE Gathering's reasonable satisfaction. Creditworthiness will be based upon (1) a credit rating of investment grade defined as a rating of at least "BBB-" by Standard & Poor's Corporation, a rating of at least "Baa3" by Moody's Investors Service, or a rating of at least BBB- by Fitch; or (2) if public credit reports are not available, an equivalent rating of investment grade as determined by DTE Gathering based on the financial rating methodology, criteria and ratios for the industry of the Shipper as published by the above rating agencies from time to time. For purposes of credit evaluation, DTE Gathering will consider the following, as applicable: (i) audited financial statements; (ii) annual report; (iii) most recent filed statements with the Securities and Exchange Commission (or an equivalent authority) or such other publicly available information; (iv) for public entities, the most recent publicly available interim financial statements, with an attestation by its Chief Financial Officer, Controller or equivalent that such statements constitute a true, correct and fair representation of financial condition prepared in accordance with Generally Accepted Accounting Principles (GAAP) or equivalent; (v)publicly available credit reports from credit and bond rating agencies; (vi) private credit ratings, bank or trade references; (vii) past payment history to DTE Gathering; (viii) whether Shipper has filed for bankruptcy protection and/or is operating under any chapter of the bankruptcy laws; (ix) whether Shipper is subject to liquidation or debt reduction procedures such as an assignment for the benefit of creditors or any creditors' committee agreement; (x) whether Shipper's credit rating has been downgraded by a credit rating agency within the last six months and (xi) such other information as may be mutually agreed to by DTE Gathering and Shipper.

19.2 If DTE Gathering determines that Shipper is not creditworthy, then within five (5) business days of notice from DTE Gathering, Shipper shall provide DTE Gathering with one of the following credit alternatives (1) a corporate guaranty of all Shipper obligations from a creditworthy entity; (2) an irrevocable letter of credit in form and from an institution satisfactory to DTE Gathering; (3) prepayment for one Month service assuming Shipper will deliver its full MDQ each Month (deposit equal to 8.33% of Shipper's estimated annual bill), or (4) such other security, as reasonably determined by DTE Gathering, to be of a continuing nature and in an amount equal to such amounts which would be due for three Months service at Shipper's full MDQ. Shipper's obligation to provide credit assurance shall terminate only after all of Shipper's obligations to DTE Gathering have been satisfied and shall continue for as long as Shipper has unfavorable credit.

19.3 A guarantor shall be deemed creditworthy provided it has an investment grade rating for its long-term senior unsecured debt from at least two of the recognized rating agencies listed below. The minimum acceptable investment grade rating from each of the indicated rating agencies is Baa3 by Moody's, BBB- by S & P and BBB- by Fitch. A guarantor that is considered creditworthy at the time it provided the guaranty but, at a later date, no longer meets the creditworthiness standards of this Section will be required to provide other security acceptable to DTE Gathering within five (5) business days of notice from DTE Gathering that the guarantor fails to meet the creditworthiness standards of this Section.

## ARTICLE XX

## MISCELLANEOUS PROVISIONS

20.1 Assignment: Neither Party may broker, assign, convey or transfer its interests, rights and obligations under this Agreement without the prior written consent of the other Party, which shall not be unreasonably withheld provided that DTE Gathering may broker, assign, convey or transfer its interests, rights and obligations under this Agreement to an affiliate without the prior written consent of Shipper,

20.2 Reorganization: Any company which succeeds by purchase, merger, or consolidation to the properties, substantially or as an entirety, of Shipper or of DTE Gathering, as the case may be, will be entitled to the rights and will be subject to the obligations of its predecessor in title under this Agreement.

20.3 Successors and Assigns: This Agreement will be binding upon and enure to the benefit of the Parties and their respective successors and permitted assigns.

20.4 Headings: The headings used throughout this Agreement are inserted for convenience of reference only and are not be considered or taken into account in construing the terms or provisions hereof nor are they to be deemed in any way to qualify, modify or explain the effect of any such provisions or terms.

20.5 Gender, Number and Internal References : Unless the context otherwise requires, words importing the singular include the plural and vice versa, and words importing gender include all genders. The words "herein", "hereunder" and words of similar import refer to the entirety of this Agreement and not only to the Section in which such use occurs.

20.6 Entirety: This Agreement and Exhibit A, Exhibit B, Exhibit C and Exhibit D constitute the entire agreement between DTE Gathering and Shipper concerning the subject matter hereof. Any prior understandings, representations, promises, undertakings, agreements or inducements, whether written or oral, concerning the subject matter hereof not contained herein shall have no force and effect. This Agreement may be modified or amended only by a writing duly executed by both Parties.

**IN WITNESS WHEREOF,** the Parties have caused this Agreement to be executed as of the day and year first above written.

**DTE MICHIGAN GATHERING COMPANY**

By:__________________________________

Title: ________________________________

Date: ________________________________

**SHIPPER**

By:__________________________________

Title _______________________________

Date: ________________________________

# EXHIBIT A
## RECEIPT POINTS

| Meter Name | Meter Number | Allocation Name | Allocation Number | MDQ |
|---|---|---|---|---|

**EXHIBIT B**
**DELIVERY POINTS**

| Facility Name | Location | Pressure (psig) | Meter Capacity (MMcf/d) |
|---|---|---|---|
| DTE Gas 30” T&D Line (Kalkaska DTE Gas) | Kalkaska | 950 | 360 |
| Consumers Energy 12” T&D Line (GC-CE) | Goose Creek | 960 | 190 |
| ANR 36” Storage Line (Kalkaska –ANR) | Kalkaska | 950 | 150 |
| Great Lakes 36” Transmission Line | Goose Creek | 950 | 50 |

# EXHIBIT C

## GAS TRANSPORTATION TERMS



## I. SERVICE REQUESTS

A. Transportation Service provided pursuant to this Agreement will be offered on a firm basis until 100% of the capacity of the AEP is subscribed. Thereafter, service will be offered on an interruptible basis. DTE Gathering may provide service on an interruptible basis only to the extent capacity exceeds its firm commitments.

B. One year after the Effective Date of this Agreement, if for any consecutive twelve (12) Month period, Shipper transports an amount of Gas on a daily basis that averages less than ninety (90%) of Shipper's total MDQ, then DTE Gathering may adjust such MDQ downward to equal Shipper's daily average of transported quantities for such prior twelve Month period, unless Shipper provides DTE

Gathering with reasonable assurances that the average amount of gas that Shipper will make available for transportation within the next twelve (12) Months shall equal or exceed Shipper's MDQ. If a Force Majeure event occurred during any of the prior twelve (12) Month period, or if Shipper's MDQ was reduced during any of the prior twelve (12) Month period due to DTE Gathering's lack of capacity on the AEP, then such Month(s) shall be excluded and the next prior Month(s) used instead. Furthermore, if Shipper's transported quantities of Gas on a daily basis for a three (3) Month period exceed Shipper's total MDQ, then Shipper may request an increase of its MDQ, and DTE Gathering will, at the end of the calendar quarter, grant Shipper's request on pro rata basis with all other shippers' requests for MDQ increases subject to capacity restraints on the AEP.

II. NOMINATIONS, SCHEDULING and ALLOCATIONS

A. Nominations must be made via eNominator. Specific information to be included in the nomination is displayed within eNominator. Nominations are on an MMBtu basis.

B. Shipper, or its designated agent, shall nominate on eNominator the daily quantity of gas for delivery to DTE Gathering on behalf of Shipper. Nominations shall be submitted by 2:00 p.m. prior to the effective Gas Day.

C. Shipper's Agent. Shipper may designate an agent to nominate and schedule Gas Transportation Service on Shipper's behalf provided that such designation is in writing and provided to DTE Gathering or its affiliate (referred to collectively herein as the "DTE Parties"). Shipper shall indemnify, defend and save DTE Parties harmless from all suits, actions, debts, accounts, damages, costs, losses and expenses arising in any way from Shipper's agent's actions on behalf of Shipper.

D. Hourly Variation. Shipper shall maintain uniform hourly rates at all Receipt Points hereunder to the extent practicable.

E. Delivery of Gas. DTE Gathering shall make daily delivery of Equivalent Quantities of Gas, at each Delivery Point that Shipper nominates, provided, however, that Shipper may not take delivery of Gas for quantities it has not nominated and delivered to DTE Gathering at Receipt Point(s).

F. Scheduling and Allocation of Capacity. There are four service levels: firm, Authorized Overrun Gas, Unauthorized Overrun Gas, and interruptible. For each day, DTE Gathering will schedule receipts and deliveries of Gas on the basis of Shippers' confirmed nominations pursuant to the following:

i. If the AEP is not at full capacity due to the transportation of shippers' firm MDQ, then excess capacity will exist such that DTE Gathering is able to receive (a) Authorized Overrun Gas nominations in excess of a Shipper's MDQ, or (b) interruptible nominations;

ii. Unauthorized Overrun Gas shall occur when a Shipper exceeds its MDQ and fails to comply with the criteria set forth in Section 5.1.5 of the Agreement;

iii. Firm, Authorized Overrun Gas, or interruptible will be curtailed on a pro rata basis within each service category; however, any Authorized Overrun Gas is subordinate to firm and shall be curtailed if any other firm shipper(s) wish to nominate up to their MDQ; and further provided that any interruptible is subordinated to Authorized Overrun Gas and shall be curtailed if a firm shipper wishes to use Authorized Overrun Gas;

iv. DTE Parties may allocate Receipt Point capacity, if required, pro rata by confirmed nominations up to the firm MDQ at each Receipt Point;

v. DTE Parties may allocate transportation capacity, if required, pro rata by confirmed nominations up to the firm MDQ;

vi. DTE Parties shall allocate Delivery Point capacity, if required, pursuant to each shipper's transportation priority (firm, Authorized Overrun Gas, or interruptible) up to the MDQ at each Delivery Point. If allocation of Delivery Point capacity is required among shippers with firm priority, then such allocation will be based on each shipper's instructions to DTE Parties or on a pro rata basis if instructions are not received or conflict;

vii. In the event that Shipper is transporting Unauthorized Overrun Gas and DTE Gathering determines that it will curtail such Unauthorized Overrun Gas, then DTE Gathering may identify any volumes by Points of Receipt as the volumes that must be curtailed in order to bring Shipper into compliance with its MDQ.

G. Accounting for Receipts and Deliveries.

i. Following each Month, DTE Parties will forward to Shipper a report detailing Shipper’s quantities in Mcfs and MMBtu.

ii. Allocation of Deliveries.

All deliveries will be allocated throughout the Month based on confirmed nominations at each Delivery Point. Delivery Point quantities allocated among Shippers will be reconciled at the end of each Month.

iii. Allocation of Receipts.

Where there is more than one shipper at a Receipt Point, then allocation of actual quantities will be made throughout the Month on a working interest percentage, based on Shipper's confirmed nominations for each such Receipt Point. Receipt Point quantities will be reconciled at the end of each Month.

iv. Electronic Information.

DTE Parties will operate its allocation procedures using electronic information available at Receipt Point(s) and/or Delivery Point(s). If such electronic information is not available on any day, then DTE Parties will assume that receipts and/or deliveries are equal to nominations, provided, however, that DTE Parties shall adjust such assumed receipts and/or deliveries to actual receipts and/or deliveries as soon as is reasonably practicable after the actual information becomes available. Any such prior period adjustments will not cause a penalty upon Shipper hereunder.

III. PAPER POOLING

A. Once DTE Parties have allocated Gas pursuant to this Agreement, then any over deliveries or under deliveries by Shipper at one Receipt or Delivery Point may be offset by underdeliveries or overdeliveries by Shipper at another Receipt or Delivery

Point, respectively ("Paper Pooling"). Such netting will be used by DTE Parties for determining any imbalance penalties under this Agreement.

B. Paper Pooling does not relieve Shipper from its obligation to make valid nominations or its obligation for Gas imbalances under the terms of this Agreement.

IV. <u>MONTHLY IMBALANCES</u>

A. At the end of each Month, DTE Parties will provide each shipper with a Gas imbalance statement for that Month ("Imbalance Month"), calculated on an MMBtu basis. Shipper will be afforded the opportunity to make up the imbalance during in the second Month following the Imbalance Month, as follows:

i. If the imbalance resulted from an overdelivery of Gas based on Receipt Point volumes less Gas-in-Kind and Shrink, then for the second Month following the Imbalance Month, Shipper shall nominate and receive for redelivery at the Delivery Point, volumes equivalent to the amount of the overdelivery.

ii. If the imbalance resulted from an underdelivery of Gas based on Receipt Point volumes less Gas-in-Kind and Shrink, then for the second Month following the Imbalance Month, Shipper shall nominate and deliver to the Receipt Point, volumes equivalent to the amount of the underdelivery.

iii. Gas nominated pursuant to Sections IV.A.i. and IV.A.ii. ("Pay-back Gas") must be the first Gas nominated for the second Month following the Imbalance Month. If Pay-back Gas is not the first gas nominated, DTE Parties, at its discretion, may refuse nominations for Shipper's Gas.

B. If at the end of any Month following an Imbalance Month, Shipper's net imbalance, after paper pooling, exceeds its confirmed nomination by a tolerance of ten percent (10%) or greater, then Shipper will incur an imbalance penalty of 10¢ per Mcf for the amount of the imbalance in excess of the ten percent (10%) tolerance. Such penalty will apply to any Gas imbalance not resolved by the end of the Month as provided in Section IV.A. above and for each Month thereafter until the imbalance is resolved.

C. If upon termination of this Agreement, Shipper has not caused to be delivered to DTE Gathering at the Receipt Points, quantities of Gas in MMBtu that are equal to those that Shipper has taken at the Delivery Point(s), plus those quantities retained by DTE Gathering as compensation for Gas-in-Kind, the term of this Agreement will be extended for a period of up to sixty (60) days during which time Shipper shall cause the deficient quantity to be delivered to DTE Gathering pursuant to this Agreement at a mutually agreeable daily rate of delivery. Should Shipper fail to correct this imbalance within the sixty (60) day period, Shipper shall pay DTE Gathering, as liquidated damages, an amount equal to one hundred ten percent (110%) of the currently effective Gas Cost Recovery Factor (pursuant to DTE Gas's Rate Book, or its successor, on file with the Michigan Public Service Commission) for any remaining deficient quantities.

D. If upon termination of this Agreement, Shipper has delivered to DTE Gathering at the Point(s) of Receipt, quantities of gas that are in excess of those that Shipper has taken at the Point(s) of Delivery, plus those quantities retained by DTE Gathering as compensation for Gas-in-Kind, the term of this Agreement will be extended, for a period of up to sixty (60) days, during which time Shipper shall receive the excess quantities from DTE Gathering pursuant to this Agreement at a mutually agreeable daily rate of receipt. Should DTE Gathering fail to correct this imbalance within the sixty (60) day period, DTE Gathering shall pay Shipper, as liquidated damages, an amount equal to 110% of the currently effective Gas Cost Recovery Factor (pursuant to DTE Gas's Rate Book or its successor on file with the Michigan Public Service Commission) for any remaining deficient quantities.

V. MEASUREMENT AND MEASUREMENT EQUIPMENT

A. Measurement

i. The unit of volume for the purpose of measurement shall be one Mcf.

ii. The average atmospheric (barometric) pressure at each Receipt Point and each Delivery Point shall be assumed to be fourteen and four-tenths (14.4) pounds per square inch, irrespective of the actual location or elevation above sea level of the Receipt Point or Delivery Point or of any variation in actual atmospheric pressure from time to time.

iii. The flowing temperature of the gas(es) shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 3.

iv. The static pressure of the gas(es)at the tap for each Receipt Point or Delivery Point shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 3.

v. The orifice differential pressure of the Gas shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 3.

vi. The supercompressibility factor used in computing the volume of Gas delivered through a meter shall be determined in a manner consistent with the method contained in the American Gas Association "Manual for the Determination of Supercompressibility Factors for Natural Gas (AGA Report No. 8, Detail Method)" as such publication may be revised from time to time.

vii. The gas analysis, specific gravity, heating value, and mole percentage of the components of the gas used in computing the volume of gas delivered shall be determined at intervals of at least thirty (30) days and not to exceed forty five (45) days by means of an instrument(s) of standard manufacture accepted in the industry for this purpose using a sample of gas, or a representative sample of gas, of the gas stream flowing to the Receipt Point(s) or Delivery Point(s). If a valid sample cannot be obtained and processed without issue, then the last valid sample will be used until such a time as a valid sample can be successfully obtained and processed. Installation of and continual use of a gas chromatograph at any Receipt

Point(s) or Delivery Point(s) may be substituted for the other gas analysis provisions under this Section.

B. Measurement Equipment

i. The volume of gas delivered at each Receipt Point or Delivery Point shall be measured by utilizing one of the following,

(a) An orifice meter designed, installed, maintained and operated as recommended in the latest issue of American National Standard ANSI/API 2530 (American Gas Association Gas Measurement Report No. 3), entitled "Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids", as such publication may be revised from time to time (hereinafter referred to as "AGA Report No. 3") (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper); or

(b) A turbine meter designed, installed, maintained and operated as recommended in the latest issue of American Gas Association Transmission Measurement Committee Report No. 7 entitled "Measurement of Fuel Gas by Turbine Meters", as such publication may be revised from time to time (hereinafter referred to as "AGA Report No. 7" (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper); or

(c) An ultrasonic meter designed, installed, maintained and operated as recommended in the latest issue of the American Gas Association Gas

Measurement Report No. 9, entitled "Measurement of Gas by Multipath Ultrasonic Meters", as such publication may be revised from time to time (hereinafter referred to as "AGA Report No. 9") (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper); or

(d) A positive displacement meter installed and operated in accordance with generally accepted industry practices (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper).

The construction and installation of the metering facilities shall be in accordance with the recommendations and specifications set forth by the reports specified in Sections i(a), i(b), and i(c) hereof or by the meter manufacturer specified in Section i(d) hereof.

ii. Any auxiliary measuring equipment, if utilized, shall be installed, maintained and operated in accordance with generally accepted industry practices. Chromatographs calculating the heating value (Btu) of the gas shall be programmed having the Gas Processors Associated (GPA) Standard 2145 Table of Paraffin Hydrocarbons and Other Components of Natural Gas.

iii. The volume of gas delivered at each Receipt Point or Delivery Point shall be calculated by means of an electronic flow computer located at each Receipt Point or Delivery Point. The calculation shall be performed in the following manner:

(a) When the measuring equipment is an orifice meter, the flow of gas through the meter shall be computed in the manner recommended in AGA Report No. 3, properly using all factors set forth therein.

(b) When the measuring equipment is a turbine meter, the volume of gas delivered through the meter shall be computed in the manner recommended in AGA Report No. 7, properly using all facts set forth therein.

(c) When the measuring equipment is an ultrasonic meter, the volume of gas delivered through the meter shall be computed in the manner recommended in AGA Report No.9, properly using all facts set forth therein.

(d) When the measuring equipment is a positive displacement meter, the volume of gas delivered through the meter shall be computed by properly applying, to the volume delivered at flowing gas pressures and temperatures, correction factors as specified in the AGA Gas Measurement Manual Part Two, Displacement Measurement.

iv. The operator, for purposes of this Section, shall be DTE Parties. All flow, measuring, testing and related equipment shall be of standard manufacture and type approved by DTE Parties. Shipper may install check measuring equipment, provided that such equipment shall be installed so as not to interfere with the operations of DTE Parties. Shipper, in the presence of DTE Parties shall have access to measuring equipment at all reasonable times, but the reading, calibrating and adjusting thereof shall be done by DTE Parties. Shipper shall have the right to be present at the time of the installing, reading, cleaning, changing, repairing, inspecting, testing, calibrating or adjusting done by DTE Parties. The records from such measuring equipment shall remain the property of DTE Parties, but upon request, Shipper may request copies of the records, if any, together with calculations therefrom for inspection, subject to return within ten (10) working days after receipt thereof or longer if extended by mutual agreement. Reasonable care shall be exercised in the installation, maintenance and operation of the measuring equipment to avoid any inaccuracy in the determination of the volume of gas received and delivered. The components of the electronic measurement system shall be calibrated once every ninety (90) days but not to exceed one hundred twenty (120) days pursuant to Section viii below. If DTE Parties fails to perform the verification and testing, then Shipper shall have the right to cease or temporarily discontinue Gas Transportation Service under this Agreement relative to such measuring equipment. If either Party at any time desires a special test of any measuring equipment, it will promptly notify the other Party and the Parties shall then cooperate to secure a prompt verification of the accuracy of the equipment. The expense of any special test shall be borne by the Party requesting it if the measuring equipment is found to be in error by not more than two percent (2%) error in the aggregate. If, upon any test, any measuring equipment is found to be in error, such errors shall be taken into account in a practical manner in computing the deliveries. If the resultant aggregate error in the computed receipts or deliveries is not more than two percent (2%) error in the aggregate as measured during a calibration, then previous receipts or deliveries shall be considered accurate. All equipment shall, in any case, be adjusted at the time of testing to record correctly. If, however, the resultant aggregate error in computing receipts or deliveries exceeds two percent (2 %) error in the aggregate as measured during a calibration, then the previous recordings of such equipment shall be corrected to zero error for any period that is known definitely or agreed upon, but in case the period is not known definitely, or agreed upon, the correction shall be for the period extending over one-half of the time elapsed since the date of the last test.

v. In the event any measuring equipment is out of service, previous recordings of receipts or deliveries through such equipment shall be corrected using the following procedures:

(a) by using the registration of any check meter or meters, if installed and accurately registering, or in the absence of (a);

(b) by correcting the error if the percentage of error is ascertainable by calibration, special test or mathematical calculation, or in the absence of both (a) and (b) then;

(c) by estimating the quantity of receipt or delivery based on receipts or deliveries during preceding periods under similar conditions when the meter was registering accurately.

The correction period shall not exceed twelve (12) Months from the most recent test.

vi. If at any time during the term of service a new method or technique is developed with respect to gas measurement or the determination of the factors used in gas measurement, the new method or technique may be substituted upon DTE Parties' sole discretion, provided such measuring methodology is adopted by or acceptable to the natural gas transportation industry.

vii. The Parties agree to preserve for a period of at least two (2) years or such longer period as may be required by the applicable, valid requirements of any governmental bodies having or asserting jurisdiction, all test data, and other similar records.

viii. Electronic Gas Measurement (EGM) Technical Requirements

(a) Accuracy: The meter system should use instruments that will provide an overall measurement accuracy of + or - 0.5% of flow, taking into account all the sources of error, including calibrated span of instruments, linearity, hysteresis, repeatability, ambient temperature, stability, vibration, and power supply fluctuation. Generally, this accuracy can be achieved only by the use of high accuracy smart transmitters with a published accuracy of $\pm$ 0.1%.

Differential Pressure Transmitters shall be of a type that self compensate for static pressure effect or manufacturer's published compensation factor shall be programmed into the flow computer ("RTU").

All instruments should operate on a temperature range of negative 30 degrees Fahrenheit to positive 120 degrees Fahrenheit. The unit must be able to withstand mechanical shock of at least 1 G and Shipper will to be held responsible for any accidental damage to the equipment as a result of mechanical shock of over 1 G.

All equipment shall be installed per the specifications identified in AGA-3, AGA-7, and AGA-8 documents.

(b) Computation: The flow computer of the meter system shall as a minimum perform flow calculation per AGA-3, AGA-7, AGA-8, and AGA-9 requirements. As the aforementioned calculation methods are revised from time to time, new releases shall be implemented within twelve Months from the release data. Any costs related to the implementation of such upgrades shall be recovered from the Shipper. All other methods of computation must be approved by both Shipper and DTE Parties. All measured variables for differential pressure, static pressure, and temperature shall be sampled at least once per second. All volume calculations shall be made at least once per second.

(c) Data Security: The RTU must have password protection before data can be accessed or any parameters can be changed.

(d) Safety: The EGM system must meet standards for Class I, Division 2, Group D installations.

(e) Power: The RTU and the related hardware should run on re-chargeable batteries. These batteries can be charged by 20 VAC, 24 VDC or solar panels. For previously installed equipment, the battery capacity shall not be less than eight (8) hours. For future EGM installation, the battery capacity shall be at least twenty-four (24) hours when fully charged.

(f) Local Display: Shipper shall be provided with capability to monitor volume information being recorded by measurement system on an ongoing basis with either RTU display or transmitters with local display.

(g) All test and calibration equipment shall be certified to 0.1% accuracy and traceable back to an NIST primary standard. All test and calibration equipment shall be re-certified at least annually. In addition, DTE Parties shall perform such inspections and test of the accuracy of the equipment used in the EGM system calibrations. A copy of any inspection test of certification report for the meter that measures Shipper's Gas, whether performed by DTE Parties or a third party, shall be made available to Shipper personnel upon written request. After reasonable notice and request, DTE Parties shall provide Shipper with documentation on the tests and inspection and the annual certification planned for the equipment used to calibrate the EGM equipment. Calibration equipment must satisfy all applicable safety codes for the location in which it is being used, or the area must be checked and confirmed as gas free (less than 5 % LEL) prior to and during use.

A full loop (end device through RTU) test/calibration is required on all ANALOG inputs. Any adjustments to or calibration of the equipment shall be documented and kept as part of the audit trail. Provisions shall be made for Shipper to tap into meter run with an electronic transmitter for periodic calibration comparison, provided, however, any such tap shall be done with permission from DTE Parties and shall not interfere with DTE Parties' measurement operations at that point. The flow computer and/or RTU shall freeze the analog transmitter values during transmitter calibration and orifice plate removal and use the frozen values for the flow computation during calibration and orifice plate removal and re-installation.

(h) Audit: The following information must be kept for a minimum of two (2) years following the calendar year of production, or such longer period as may be required by the applicable, valid requirements of any governmental bodies having or asserting jurisdiction:

(1) All calculated volumes, energies, and daily averages must be maintained in their original unaltered form.

(2) Any changes to the data to correct for inaccuracies must be fully documented, including assumptions and factors used in calculating the adjustment.

All audit information will be available to Shipper personnel during normal business hours, upon reasonable notice and request.

ix. If, after two consecutive months of operations, the meter is operating at less than ten percent (10%) of the design capacity, DTE Parties may require that the flow be shut in or the meter station be redesigned to accurately measure the quantity of gas at the Shipper's expense.

x. If, after two consecutive months of operations, the meter is operating at greater than ninety percent (90%) of the design capacity, DTE Parties may require that the flow be shut in or the meter station be redesigned to accurately measure the quantity of gas at the Shipper's expense.

## VI. GAS QUALITY SPECIFICATIONS

Unless prior approval is obtained from DTE Parties, all Gas received and delivered under the terms of this Agreement must conform to the following specifications:

(a) The Gas must be commercially free from dust, gum, gum-forming constituents, and all other solid and liquid matters which may interfere with its merchantability or cause injury to or interfere with proper operation of the pipelines, regulators, meters or other appliances through which it flows;

(b) The Gas may not contain anything which might adversely affect the safe and efficient operation of DTE Parties' downstream facilities;

(c) The water content of the Gas may not exceed 5 pounds per million cubic feet;

(d) The Gas may contain oxygen according to the requirements of Section VIII, Oxygen Content, below;

(e) At any Receipt Point, the carbon dioxide content of the Gas may not exceed two mole percent (2%), unless Shipper can demonstrate that it has downstream treating agreements satisfactory to DTE Parties which provide that the carbon dioxide content of the gas will not exceed two mole percent (2%) at the outlet of the treating plant, in which case the carbon dioxide content may not be excessive in DTE Parties' sole opinion;

(f) The Gas may not contain more than 1/4 grain of hydrogen sulfide per 100 cubic feet;

(g) The Gas may not contain more than 1/2 grain of mercaptan sulfur per 100 cubic feet;

(h) The Gas may not contain more than 5 grains of total sulfur per 100 cubic feet, including the sulfur in any hydrogen sulfide, mercaptan, sulfides and residual sulfur;

(i) The Gas redelivered at each Delivery Point must have a total heating value per cubic foot of not less than 950 BTu at a base pressure of 14.65 pounds per square inch at 60 degrees Fahrenheit on a dry basis. If the Gas has been included in a downstream Gas treating agreement, the Gas at each Receipt Point must have a reasonable total heating value per cubic foot in DTE Parties' sole opinion;

(j) In the event the Gas delivered by Shipper at the Receipt Point(s) fails at any time to meet these quality specifications, DTE Parties shall notify Shipper of such deficiency and thereupon may, at its option, refuse to accept deliveries pending correction. Upon demonstration acceptable to DTE Parties that the Gas being tendered for delivery meets these quality specifications or that Shipper has arranged for the necessary treatment, processing or other action required for the Gas to meet these quality specifications, DTE Parties shall commence or resume, as the case may be, taking delivery of Gas;

(k) Shipper agrees to indemnify and hold DTE Parties harmless for any and all liability resulting from DTE Parties' movement of Gas received by Shipper which fails to meet the specifications hereunder and which have not been waived in writing by DTE Parties, including contamination or damage to other Gas being transported.

VII. DIVERSION OF GAS

The AEP is a stand-alone system for the $CO_2$ treating and transportation of Gas. The AEP has no direct end user or distribution markets, but interconnects with (i) DTE Gas, (ii) ANR Pipeline Company, (iii) Great Lakes Gas Transmission and (iv) Consumers Power Company ("Four Pipelines"), that do have direct markets. The Parties recognize that the AEP is thus not subject to diversion of gas. However, when AEP gas is delivered into each of the Four Pipelines, then such gas is subject to the diversion rules that apply to each such pipeline.

VIII. OXYGEN CONTENT

Shipper agrees that its Gas shall not exceed the acceptable concentration for oxygen in the gas stream as specified in the operating procedures set forth in Exhibit D (“Antrim Oxygen Procedures”) attached hereto.

# Exhibit D

## ANTRIM OXYGEN PROCEDURES

I. MIX MASTER AND PIPELINE ANALYZERS.

A. Oxygen content at the DCP South Chester Antrim plants will be determined by an oxygen analyzer on the discharge of a new physical header ("Mix Master Analyzer"). The Mix Master Analyzer shall measure the oxygen content of the aggregate of Gas transported on the North Chester, South Chester, Little Bear, and Spartan pipelines ("Pipeline(s)"). The Mix Master Analyzer and the individual analyzers ("Pipeline Analyzers") will be maintained by DTE Parties.

B. The Mix Master Analyzer and the Pipeline Analyzers shall be calibrated and maintained according to the manufacturer's guidelines, except that the calibration gas used for calibration shall be no greater than nominal ten (10) parts per million ("PPM"). Shipper and all other shippers of Gas on the Pipelines shall have the right to designate a single representative, for the entire group, to witness all subsequent calibrations of the Mix Master Analyzer and each Pipeline Analyzer.

C. Shippers shall maintain the oxygen content of the Gas as determined by the Mix Master Analyzer at 3 PPM or less.

II. CPF ANALYZER.

A. Shipper shall install or cause to be installed an oxygen analyzer at each of its central processing facilities ("CPFs") or grouping of CPFs ("CPF Analyzer"). The CPF Analyzer shall be located upstream of the Receipt Point and Pipelines and shall measure the oxygen content of Gas representative of Gas being delivered into the Pipelines.

B. The CPF Analyzers shall be calibrated and maintained according to the manufacturer's guidelines, except that the calibration gas used for calibration shall be no greater than nominal ten (10) PPM. DCP and/or DTE Parties shall have the right to designate a single representative to witness all subsequent calibrations of each CPF Analyzer.

C. Each CPF Analyzer shall be equipped with a continuous recording device for the oxygen content. At Shipper's election, a CPF need not be equipped with continuous oxygen recording devices if the CPF is tied to a CPF kill/divert device set at 3 PPM oxygen, which will automatically prohibit any Gas from entering a Pipeline if the Gas contains oxygen above 3 PPM for a period of two (2) hours. DCP and/or DTE Parties shall have the right to designate a single representative to witness the calibration and operation of the kill/divert device.

D. Shipper shall maintain records of CPF Analyzer oxygen content readings, or records of the occurrence of automatic kill/divert incidents, for a period of not less than two (2) years. Shipper shall make the information available to either DTE Parties or DCP within twelve (12) business hours of a telephoned, e-mailed or faxed request for such information.

E. Shipper may at any time during normal business hours, request a DCP and/or DTE Parties representative to enter the Shipper's facilities to view the CPF Analyzer and its output. The DCP and/or DTE Parties representatives shall be accompanied by a Shipper representative at all times they are at Shipper's facilities.

III. MIX MASTER GREATER THAN 3 PPM AND LESS THAN 7 PPM.

If the oxygen content of the aggregate Gas stream, determined by the Mix Master

Analyzer, exceeds three (3) PPM, but is less than seven (7) PPM, DCP shall notify all shippers of Gas that have provided e-mail addresses, on any of the Pipelines via e-mail that the oxygen content must be at or below 3 PPM within 24 hours ("Notice"). The oxygen content at the Mix Master Analyzer must continuously register at or below three (3) PPM within and until 24 hours after sending the Notice. If the oxygen content of the aggregate Gas stream determined by the Mix Master Analyzer does not continually register at or below three (3) PPM within and until the 24 hour period, all shippers found to be flowing Gas at a receipt point in excess of 3 PPM shall be shut in, at that Receipt Point only, until Shipper and each other shipper at such receipt point establish to the reasonable satisfaction of DCP and/or DTE Parties that they can flow Gas at 3 PPM or less.

i. If Shipper can reasonably demonstrate to either DTE Parties or DCP personnel that the oxygen reading above 3 PPM at the receipt point and/or on its CPF Analyzer was a temporary condition, the production upstream of Shipper's Receipt Point will not be shut in.

ii. If Shipper was not flowing Gas at the point in time when the Mix Master Analyzer registered over 3 PPM, and, when Shipper's Receipt Point returns to production, the CPF Analyzer oxygen level exceeds 3 PPM, then Shipper will be allowed to flow Gas, provided the CPF Analyzer oxygen content falls below 3 PPM within one (1) hour after the commencement of Gas flow. If the oxygen level at the CPF Analyzer does not fall below 3 PPM within the one-hour period, Shipper shall immediately shut in all production upstream of that particular CPF Analyzer. If Shipper fails to shut in all production upstream of the CPF Analyzer, Shipper shall be shut in by DTE Parties and/or DCP. DTE Parties must be notified prior to any subsequent attempts by Shipper to deliver Gas into a Pipeline. Within twelve (12) business hours after returning to flowing Gas, Shipper shall provide CPF Analyzer data to DCP or DTE Parties to demonstrate that the oxygen content at the CPF Analyzer was reduced to below 3 PPM within one (1) hour of returning to production.

IV. INSTALLATION OF KILL/DIVERT.

If Shipper has had a CPF and/or Receipt Point that has been shut three (3) or more times in any 90-day rolling period, then Shipper shall tie its CPF Analyzer to a CPF kill/divert device so that any time the oxygen content of the Gas recorded at the CPF Analyzer exceeds 3 PPM for a period of two (2) hours, the Gas production monitored at the CPF Analyzer will be prevented from entering a Pipeline. Upon written request, Shipper shall be allowed by DCP and/or DTE Parties to remove the CPF kill/divert device from the CPF Analyzer if Shipper can demonstrate that for six (6) months, Shipper was continuously flowing Gas, subject to the two (2) hour period specified above, that contained 3 PPM or less of oxygen at the CPF Analyzer.

V. MIX MASTER GREATER THAN 7 PPM.

If the oxygen content determined by the Mix Master Analyzer exceeds seven (7) PPM, then DCP will observe the oxygen content of the Mix Master Analyzer for a period of thirty (30) minutes. If, at or before the date and time the Mix Master Analyzer registered more than 7 PPM oxygen, DCP had received notice from any shipper on any of the Pipelines, that a temporary condition had occurred, which resulted in oxygen greater than 3 PPM entering a Pipeline, then the observation period shall be one (1) hour. If at the end of the observation period, the Mix Master Analyzer reading remains at seven (7) PPM or above, then DCP will take the following actions in the following order:

i. The oxygen content recorded by each of the Pipeline Analyzers will be observed.

ii. Any Pipeline with an oxygen level of ten (10) PPM or greater will have its flow immediately curtailed.

ii. All shippers on the Pipeline, will be notified via e-mail by DCP and/or DTE Parties of the flow curtailment on a particular Pipeline.

iii. The Pipelines having the highest level of oxygen determined by the Pipeline Analyzer shall be curtailed first, provided, however, no Pipeline with less than three (3) PPM oxygen will be curtailed.

iv. DCP shall have the right to establish or continue flow curtailment in any Pipeline containing more than three (3) PPM oxygen until such time as the total Gas stream at the Mix Master Analyzer has been reduced to continuously record three (3) PPM or less.

VI. <u>PIPELINE ANALYZER GREATER THAN 10 PPM.</u>

Each of the four Pipelines must, individually, at all times, contain less than ten (10) PPM of oxygen. If a Pipeline Analyzer is registering greater than 10 PPM and the Mix Master Analyzer is registering greater than 3 PPM, DCP shall have the right to immediately curtail flow on the offending pipeline. If oxygen greater than 10 PPM is registered on a Pipeline Analyzer, but the oxygen content determined by the Mix

Master Analyzer remains below 3 PPM, then the oxygen level of Gas in a Pipeline must be reduced to continually record below 10 PPM, within and until 24 hours after a concentration of oxygen greater than 10 PPM was detected. All shippers on the Pipeline will be notified by DCP and/or DTE Parties of the excess oxygen via e-mail. If the oxygen level in the Pipeline does not continuously register below 10 PPM within and until 24 hours after the notice, then the following actions will be taken, in the following order, on a Pipeline-by-Pipeline basis:

i. The flow of Gas in the Pipeline shall be continuously monitored and curtailed and adjusted from time to time as need be, so that the oxygen content of the aggregate Gas stream as determined at the Mix Master Analyzer never exceeds three (3) PPM.

ii. If Shipper is found to be flowing Gas at a CPF Analyzer or at a Receipt Point in excess of 3 PPM oxygen, the Receipt Point shall be shut in until all shippers at such receipt point establish to the reasonable satisfaction of DCP or DTE Parties that they can flow Gas at 3 PPM or less.

iii. The flow of Gas in the Pipeline shall remain curtailed to the extent necessary until such time as the actions outlined in this Exhibit result in the Pipeline returning to a status of continuously containing less than 10 PPM of oxygen.

DP______-AEP

# ANTRIM SYSTEM

## DELIVERY POINT AGREEMENT

THIS AGREEMENT entered into as of the 30th day of August, 2017, by and between **DTE GAS COMPANY**, ("DTEG"), having an office at One Energy Plaza, 1600 WCB, Detroit, Michigan 48226 and **DTE MICHIGAN GATHERING COMPANY** ("DTE Gathering "), whose principal office is located at One Energy Plaza, 2130 WCB, Detroit, Michigan 48226. DTEG and DTE Gathering may be referred to herein collectively as the "Parties" and individually as a "Party."

## RECITALS

DTEG desires a metering facility to be located at or near section 17, Otsego Lake Township, Otsego County, Michigan to provide access to DTE Gathering's Antrim Expansion Project; and

DTE Gathering is willing to provide such a facility subject to the following terms and conditions;

NOW, THEREFORE, in consideration of the mutual promises, agreements and undertakings hereinafter set forth, it is hereby agreed by and between DTEG and DTE Gathering as follows:

## ARTICLE I

### DEFINITIONS

1.1. "Agreement" means this Delivery Point Agreement together with Schedule A – Delivery Points ("Schedule A"), Schedule B- Installation Fees ("Schedule B"), and Schedule C- General Terms and Conditions ("Schedule C").

1.2. "Antrim Expansion Project" or "AEP" means the pipeline expansion project as filed by DTE Gathering in the Michigan Public Service Commission Case No. U-10547, which includes (i) the utilization of a portion of DTE Lateral's Northern Michigan Wet Header gathering system for purposes of providing transportation, and (ii) transportation on the DTE Lateral lateral pipelines.

1.3. "Btu" means British Thermal Unit, which is the quantity of heat necessary to raise one pound of water one degree Fahrenheit and is exactly equal to 1055.056 joules.

1.4. "$CO_2$" means carbon dioxide.

1.5. "Commission" or "MPSC" means the Michigan Public Service Commission or any successor thereto.

1.6. "Cubic Feet of Gas" means that quantity of Gas which occupies one cubic foot at a temperature of 60 degrees Fahrenheit and at a pressure of 14.65 Psia.

**1.7.** "Delivery Point(s)" means the points set forth on Schedule A, attached hereto, at which DTE Gathering may deliver gas to DTEG as provided in this Agreement.

**1.8.** "Delivery Point Facilities" means the facilities as described in Exhibit "A" from the hot tap into the AEP up to and including the downstream flange from the measurement station including but not limited to filter separator, storage tank, ultrasonic measurement, chromatograph, flow computer and communication building. DTEG may also install certain facilities at the location including odorization, heater, regulation and other related equipment, all of which will not be considered part of the Delivery Point Facilities.

1.9. "DTE Lateral" means DTE Michigan Lateral Company.

1.10. "Equivalent Quantity(ies)" means the volume of Gas delivered by or for the account of DTEG to DTE Gathering on any day pursuant to this Agreement multiplied by a fraction, the numerator of which is the average heating value per Mcf of the Gas delivered or caused to be delivered by DTEG at a pressure base of 14.65 psia and the denominator of which is the average heating value per Mcf at a pressure base of 14.65 psia of the Gas redelivered on the same day by DTE Gathering, less any amount withheld by DTE Gathering for gas-in-kind retainage and shrink.

1.11. "Gas" means natural gas produced from the Antrim shale formation.

1.12. "Gas Day" means a period of 24 consecutive hours beginning at 10:00 AM Eastern Time (Standard or Daylight Savings) of one calendar day and ending at 10:00 AM Eastern Time (Standard or Daylight Savings) on the next following calendar day. The reference date for any day shall be that of its beginning.

1.13. "Gas" shall mean Antrim Gas and all other gas delivered for transportation services under this Agreement.

1.14. "Gas Quality Specifications" shall have the meaning provided in Section III in Schedule C.

1.15. "Gas Transportation Agreement" means the Gas Transportation Agreement executed by DTE Michigan Gathering Company and DTE Gas Company dated November 1, 2014.

1.16. "Gas Transportation Service" means transportation service provided by DTE Gathering on the AEP for DTEG on a daily basis.

1.17. "Major Repair" means any individual repair having a cost in excess of $500.00.

1.18. "Mcf" means 1,000 Cubic Feet of Gas at a pressure base of 14.65 psia.

1.19. "MGAT Parties" means DTE Michigan Gathering or its affiliate.

1.20. "MMBtu" means one million Btu.

1.21. "Month" means the period commencing on the first Gas Day of a calendar month and extending until commencement of the first Gas Day of the next following calendar month.

## ARTICLE II

## DELIVERY POINT

2.1 The Delivery Point(s) identified on the attached Schedule A is a metering facility to allow the delivery of Gas attributable to various operators, and which is received into the Antrim Expansion Project, to DTEG under this Agreement.

The Delivery Point Facilities to be constructed, as identified in Schedule A, will, generally, consist of a new or an existing tap into the pipeline system, equipment for the measurement of Gas, monitoring and control equipment if required by DTE Gathering, and such related facilities as DTE Gathering may determine to be necessary.

2.2 DTE Gathering shall own and operate all Delivery Point Facilities into the pipeline.

(1) The Delivery Point Facilities shall conform to the Michigan Gas Safety Code and the Standards for Customer Installed Meter Facilities issued by Michigan Consolidated Gas Company on October 1, 1996 or subsequent standards in effect at the date of installation of such Delivery Point facilities. To the extent the Delivery Point Facility is considered a jurisdictional facility by the Commission and there is any inconsistency between these two standards, the terms and conditions of the Michigan Gas Safety Code will override and control this Agreement.

(2) Any existing Delivery Point Facilities identified on Schedule A have been paid for by DTEG or DTE Gathering. For the Delivery Point Facilities identified on Schedule A yet to be constructed, DTEG shall pay to DTE Gathering the sum specified in Schedule B for the installation of the Delivery Point facilities.

(3) DTEG, at its option, may install Delivery Point Facilities into the AEP provided that all construction meets the requirements in Section 2.2 (1) above. DTE Gathering will construct the tap into the AEP and perform the final

installation of all monitoring and flow computer equipment as well as the calibration of any measurement equipment and DTEG shall pay DTE Gathering for the costs of the installation of the tap and monitoring and flow computer equipment as well as the costs for any meter calibrations or third party construction inspections to verify construction is performed per the requirements in Section 2.2 (1).

2.3 The Delivery Point Facilities shall be constructed at the location determined by the Parties, consistent with Article IV. Upon completion of a newly constructed Delivery Point, DTE Gathering shall notify DTEG in writing that the Delivery Point is available for continuous delivery of Gas.

2.4 Gas delivered at the Delivery Point must be transported under an Antrim Gas Transportation Service Agreement with DTE Gathering.

2.5 Nothing in this Agreement limits DTE Gathering's right to take any action of whatever nature as may be required to correct any issues which threaten the integrity or operation of the Antrim Expansion Project, including maintenance of service to other customers.

2.6 Upon termination of this Agreement, if the Delivery Point Facilities were paid for in their entirety by DTEG, the Delivery Point Facilities, excluding the tap, will be disposed of in one of the following ways.

1) If DTE Gathering has a need for the Delivery Point facilities, then DTE Gathering will receive permanent title to the facilities by paying DTEG the salvage value based on three (3) competitive quotes of the facilities and equipment at the Delivery Point.

2) If DTE Gathering has no need for the facilities, DTEG may elect one of the following alternatives by providing DTE Gathering written notification of such election not less than twenty (20) days prior to the effective date of the termination of this Agreement. In the event that the DTEG does not make such an election, then the alternative provided in Section 2.6 (2) (c) will be utilized and the DTEG will have no further right or title to these facilities:

a) DTE Gathering will transfer ownership of the Delivery Point Facilities to the DTEG. The DTEG shall reimburse DTE Gathering for all costs associated with the abandonment and/or removal of the Delivery Point Facilities;

b) The facilities will be relocated to another point on the DTE Gathering system on behalf of the DTEG. DTEG shall reimburse DTE Gathering for all costs associated with relocating the Delivery Point Facilities; or

c) DTE Gathering will remove the Delivery Point Facilities within ninety (90) days after the Agreement has terminated.

2.7 If DTE Gathering paid for the Delivery Point Facilities, either in their entirety or in part, the Delivery Point facilities shall remain the property of DTE Gathering.

## ARTICLE III

## OPERATION AND MAINTENANCE

3.1 DTE Gathering has exclusive responsibility for the operation, maintenance and repair of the Delivery Point Facilities.

3.2 DTEG shall pay DTE Gathering the monthly charge specified in Schedule A and for the expenses associated with any individual repairs with a cost of $500.00 or less.

3.3 DTE Gathering shall notify DTEG prior to making any Major Repair and DTEG may direct DTE Gathering not to make a Major Repair, provided, however, in the case of an emergency, DTE Gathering is authorized to make any Major Repair. DTE Gathering shall make a reasonable effort to promptly notify DTEG in the event of an emergency per Section 11.1. DTEG shall reimburse DTE Gathering for the reasonable cost of any Major Repair. When the repair is completed, DTE Gathering will inform DTEG that the Delivery Point is available for continuous delivery of Gas.

3.4 DTEG shall have the right to shut-off Gas at the Delivery Point at any time for any reason.

## ARTICLE IV

## EASEMENTS AND RIGHTS-OF-WAY

4.1 To the extent DTEG owns any real property upon which the Delivery Point resides or DTE Gathering determines that additional property is required for the Delivery Point, DTEG shall provide the easements and rights-of-way determined by DTE Gathering to be necessary to construct and maintain all Delivery Point equipment, pipeline, and facilities, and provide DTE Gathering with full access to said premises. The easements and rights-of-way must be maintained for a period of ninety (90) days following termination of this Agreement to allow for the removal of the Delivery Point Facilities.

4.2 DTEG shall provide for the installation of any utilities required to serve the Delivery Point Facilities. Any costs associated with the installation of the utilities as well as the monthly utility bills shall be paid by the DTEG.

4.3 DTEG shall clear, grade and restore the construction site and undertake whatever action DTE Gathering deems necessary to provide access to the Delivery Point Facilities including, but not limited to, the installation and maintenance of roads, fences and bridges and any other act reasonably necessary or convenient for the carrying out of the terms of this Agreement.

## ARTICLE V

## TERM

5.1 This Agreement is effective as of the date first stated above and shall remain effective through October 31, 2027. This Agreement will continue in effect from year to year thereafter unless terminated by DTEG giving two (2) year prior written notice to DTE Gathering.

## ARTICLE VI

## CUSTODY OF GAS

6.1 As between the parties, DTEG shall be in exclusive control and possession of the Gas delivered under this Agreement and shall be responsible for the Gas, for any loss of Gas, and for any damage or injury caused thereby, in whole or in part, at and after delivery of the Gas at the outlet flange of the Delivery Point. This provision does not relieve DTEG of its liability under any other provision of this Agreement. DTE Gathering shall be deemed to be in exclusive control and possession of the Gas transported from receipt of the gas into the AEP until custody of the Gas is transferred to DTEG at the outlet flange of the Delivery Point.

## ARTICLE VII

## BILLING AND PAYMENT

7.1 Payments provided for in this Agreement must be made by DTEG as follows:

(a) Pursuant to Article II, Section 2.2, the installation fee must be paid concurrently with DTEG's execution of this Agreement. In the event that DTEG chooses not to construct the Delivery Point after DTE Gathering has received the installation fee, DTE Gathering shall refund the installation fee less any costs incurred by DTE Gathering related to the Delivery Point installation.

(b) Payments pursuant to Article III, Section 3.2 must be made by the 25th day of each month for work to be performed in the next month and addressed as indicated on the invoice. The monthly charge will commence on the earlier of the following dates: 1) the date Gas starts to flow or 2) sixty (60) days after the date the Delivery Point construction is completed, and continue for the duration of the Agreement notwithstanding the flow of Gas.

(c) All other payments must be made within thirty (30) days after receipt of DTE Gathering's invoice and addressed to DTE Gathering as directed on the invoice.

(d) In the event that DTEG fails to pay the amount of any invoice rendered by DTE Gathering within the allowed time, then DTEG will be subject to immediate suspension of service until such amount is paid in full.

(e) Each Party has the right during normal business hours to examine the books, records and charts of the other Party to the extent necessary to verify the accuracy of any statement, charge, invoice or computation made pursuant to the provisions of this Agreement. Any necessary adjustments in billing and payments shall be promptly made. No adjustment or correction shall be required for any error or inaccuracy occurring more than two (2) years prior to the date such error is discovered.

## ARTICLE VIII

## NON-WAIVER OF FUTURE DEFAULTS

8.1 No waiver by either Party of any one or more defaults by the other in the performance of any provision of this Agreement shall operate or be construed as a waiver of any future default or defaults, whether of a like or a different character.

## ARTICLE IX

## FORCE MAJEURE

9.1 Neither DTEG nor DTE Gathering shall be liable in damages, or in any other remedy, legal or equitable, to the other for failure to perform obligations under this Agreement due to any force majeure event which is defined as any act, omission or circumstance occasioned by or in consequence of any acts of God, strikes, lockouts, acts of the public enemy, wars, sabotage, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, arrests, restraints of rulers and peoples, civil disturbances, explosions, breakage or accident to machinery or lines of pipe, the necessity to make repairs, tests, or alterations to machinery or lines of pipe, line freezeups, the binding order of any court or governmental authority which has been resisted in good faith by all reasonable legal means, or any other cause, whether of the kind herein enumerated, or otherwise, not within the control of the Party claiming force majeure and which by the exercise of due diligence such Party is unable to prevent or overcome. A failure to settle or prevent any strike or other controversy with employees or with anyone purporting or seeking to represent employees shall not be considered to be a matter within the control of the Party claiming force majeure.

9.2 Any force majeure event affecting the performance of this Agreement by either Party, however, shall not relieve such Party of liability (i) in the event of its concurring negligence; (ii) in the event of its failure to use due diligence to remedy the event of force majeure and to remove the cause of such force majeure event in an adequate manner and with all reasonable dispatch; or (iii) from its obligations to make payments of amounts then due thereunder, unless such Party shall give notice and full particulars of the same in writing or by telecopy to the other Party as soon as possible after the occurrence relied on.

## ARTICLE X

## LAWS, ORDERS, RULES AND REGULATIONS

10.1 The performance by either Party of any and all of the obligations set forth in this Agreement are subject to all valid and applicable laws, orders, rules and regulations of any duly constituted authority having jurisdiction.

10.2 In the event of a material change in the underlying rules, orders or regulations pursuant to which DTE Gathering provides service in accordance with this Agreement, DTE Gathering may upon thirty (30) days prior written notice to DTEG unilaterally and without liability suspend, discontinue and/or terminate service under this Agreement.

10.3 THIS AGREEMENT IS GOVERNED BY THE LAWS OF THE STATE OF MICHIGAN. IT IS AGREED THAT ANY AND ALL LITIGATION RELATED TO THIS AGREEMENT MUST BE BROUGHT IN EITHER A STATE OR FEDERAL COURT LOCATED WITHIN WAYNE COUNTY, MICHIGAN, AND EACH PARTY, FOR PURPOSES OF ANY SUCH LITIGATION, SUBMITS TO THE EXCLUSIVE JURISDICTION AND VENUE OF THAT COURT.

## ARTICLE XI

## NOTICE

11.1 Any notice, request, demand, or statement provided for in this Agreement shall be in writing and sent to the Parties hereto at the following addresses:

DTEG:

DTE GAS COMPANY
One Energy Plaza, 1600 WCB
Detroit, Michigan 48226
Attn: Manager, Gas Supply & Planning

DTE Gathering:

DTE MICHIGAN GATHERING COMPANY
One Energy Plaza, 2130 WCB
Detroit, Michigan 48226

Attention: Manager, Midstream Business Development

or to such other address as may be designated by either Party.

**ARTICLE XII**

**INDEMNIFICATION; LIMITATION ON LIABILITY**

12.1 DTE Gathering agrees to take commercially reasonable steps to cooperate with DTEG in pursuing claims against Third Party Shippers (as defined below) for damages to DTEG arising out of such shipper's failure to meet the Gas Quality Specifications, including but not limited to pursuing indemnity claims against such Third Party Shippers. "Third Party Shipper" means a third party who has contractual rights with DTE Gathering to transport gas upstream of and into the Delivery Point.

12.2 Neither Party shall be liable to the other for consequential, incidental, exemplary, punitive or indirect damages, lost profits or other business interruption damages, arising out of the performance or non-performance of any obligation under this Agreement, by statute, in tort or contract, under any indemnity provision or otherwise.

**ARTICLE XIII**

**CREDITWORTHINESS**

13.1 DTEG shall demonstrate creditworthiness at the time of its request for service and, upon DTE Gathering's request at any time thereafter, if DTE Gathering has reasonable grounds for insecurity regarding DTEG's performance under this Agreement, DTEG shall demonstrate creditworthiness. DTE Gathering is not required to commence service or to continue to provide service if DTEG, when requested by DTE Gathering to demonstrate creditworthiness, fails to do so to DTE Gathering's reasonable satisfaction. Creditworthiness will be based upon (1) a credit rating of investment grade defined as a rating of at least "BBB-" by Standard & Poor's Corporation, a rating of at least "Baa3" by Moody's Investors Service, or a rating of at least BBB- by Fitch; or (2) if public credit reports are not available, an equivalent rating of investment grade as determined by DTE Gathering based on the financial rating methodology, criteria and ratios for the industry of DTEG as published by the above rating agencies from time to time. For purposes of credit evaluation, DTE Gathering will consider the following, as applicable: (i) audited financial statements; (ii) annual report; (iii) most recent filed statements with the Securities and Exchange Commission (or an equivalent authority) or such other publicly available information; (iv) for public entities, the most recent publicly available interim financial statements, with an attestation by its Chief Financial Officer, Controller or equivalent that such statements constitute a true, correct and fair representation of financial condition prepared in accordance with Generally Accepted

Accounting Principles (GAAP) or equivalent; (v) publicly available credit reports from credit and bond rating agencies; (vi) private credit ratings, bank or trade references;

(vii) past payment history to DTE Gathering; (viii) whether DTEG has filed for bankruptcy protection and/or is operating under any chapter of the bankruptcy laws; (ix) whether DTEG is subject to liquidation or debt reduction procedures such as an assignment for the benefit of creditors or any creditors' committee agreement; (x) whether DTEG's credit rating has been downgraded by a credit rating agency within the last six months and (xi) such other information as may be mutually agreed to by DTE Gathering and DTEG.

13.2 If DTE Gathering determines that DTEG is not creditworthy, then within five (5) business days of notice from DTE Gathering, DTEG shall provide DTE Gathering with one of the following credit alternatives (1) a corporate guaranty of all DTEG obligations from a creditworthy entity; (2) an irrevocable letter of credit in form and from an institution satisfactory to DTE Gathering; (3) prepayment for three Months service (deposit equal to 25% of DTEG's estimated annual bill), or (4) such other security, as reasonably determined by DTE Gathering, to be of a continuing nature and in an amount equal to such amounts which would be due for three Months service. DTEG's obligation to provide credit assurance shall terminate only after all of DTEG's obligations to DTE Gathering have been satisfied and shall continue for as long as DTEG has unfavorable credit.

13.3 A guarantor shall be deemed creditworthy provided it has an investment grade rating for its long-term senior unsecured debt from at least two of the recognized rating agencies listed below. The minimum acceptable investment grade rating from each of the indicated rating agencies is Baa3 by Moody's, BBB- by S & P and BBB- by Fitch. A guarantor that is considered creditworthy at the time it provided the guaranty but, at a later date, no longer meets the creditworthiness standards of this Section will be required to provide other security acceptable to DTE Gathering within five (5) business days of notice from DTE Gathering that the guarantor fails to meet the creditworthiness standards of this Section.

## ARTICLE XIV

## SETOFF

14.1 If DTEG shall fail to perform any of its obligations under this Agreement, and in the case of a failure to pay any amounts due hereunder, shall fail to cure such obligation within three (3) days following receipt of written demand therefor, DTE Gathering, at its sole option and without further notice to DTEG, may setoff any and all amounts due by DTEG to DTE Gathering under this Agreement, or any agreements executed between DTEG and DTE Gathering or with an affiliate of DTE Gathering against the amounts due to DTEG under this Agreement or any other agreement between DTEG and DTE Gathering or an affiliate of DTE Gathering.

14.2 The foregoing right of setoff is in addition to, and not in limitation of, any other right or remedy available to DTE Gathering (including without limitation, any right of setoff, offset, combination of accounts, deduction, counterclaim, retention, or withholding) whether arising under this Agreement, any guaranty or other credit support document, or any other agreement, under applicable law, in equity, or otherwise.

## SECTION XV

## MISCELLANEOUS PROVISIONS

15.1 Assignment: DTEG may not broker, assign, convey or transfer its interests, rights and obligations under this Agreement without the prior written consent of DTE Gathering, which shall not be unreasonably withheld. DTE Gathering may broker, assign, convey or transfer its interests, rights and obligations under this Agreement without the prior written consent of DTEG.

15.2 Reorganization: Any company which succeeds by purchase, merger, or consolidation to the properties, substantially or as an entirety, of DTEG or of DTE Gathering, as the case may be, will be entitled to the rights and will be subject to the obligations of its predecessor in title under this Agreement.

15.3 Successors and Assigns: This Agreement will be binding upon and enure to the benefit of the parties and their respective successors and permitted assigns.

15.4 Headings: The headings used throughout this Agreement are inserted for convenience of reference only and are not be considered or taken into account in construing the terms or provisions hereof nor are they to be deemed in any way to qualify, modify or explain the effect of any such provisions or terms.

15.5 Gender, Number and Internal References : Unless the context otherwise requires, words importing the singular include the plural and vice versa, and words importing gender include all genders. The words "herein", "hereunder" and words of similar import refer to the entirety of this Agreement and not only to the section in which such use occurs.

15.6 Entirety: This Agreement and Schedule A, Schedule B, and Schedule C constitute the entire agreement between DTE Gathering and DTEG concerning the subject matter hereof. Any prior understandings, representations, promises, undertakings, agreements or inducements, whether written or oral, concerning the subject matter hereof not contained herein shall have no force and effect. This Agreement may be modified or amended only by a writing duly executed by both parties.

********

The Parties have caused this Agreement to be executed by their duly authorized representatives, as of the day and year first above written.

**DTE MICHIGAN GATHERING COMPANY**

By:______________________________

Title: Manager Midstream Bus. Dev.

**DTE GAS COMPANY**

By:______________________________

Title: VICE PRESIDENT GAS SALES & SUPPLY

# SCHEDULE A

| Delivery Point Name | Meter No. | Location | Meter Size | Monthly Fee |
|---|---|---|---|---|
| AEP Gaylord Interconnect | 80540 | 97 Old State Rd., Gaylord, MI 49735* | 12" | $800 |

*At or near the NE/4 of Section 17, T29N, R3W, Otsego Lake Township, Otsego County, MI

Note: the Monthly Fee may be updated from time to time after notice is provided to DTEG by DTE Gathering that an adjustment to the fee is needed to allow for continued operation.

**SCHEDULE B**

| Delivery Point Name | Installation Fee |
|---|---|
| AEP Gaylord Interconnect | $240,700 paid by DTE Gas Company |

The identified costs are based on the majority of the facilities being constructed by DTEG and only the installation of the hot tap, monitoring facilities and flow computer along with the costs for third party calibration of the meter and third party construction inspection costs are identified in the installation fee above. After construction is completed, and the final costs are available to DTE Gathering Company, the Parties agree that if the final costs are in excess of the Installation Fee, DTEG will reimburse DTE Gathering for the excess costs, and if the final costs are less than the Installation Fee, DTE Gathering will pay DTEG the difference.

# SCHEDULE C

## GENERAL TERMS AND CONDITIONS

## SECTION I

## DELIVERY PRESSURE

1.1 DTE Gathering shall cause quantities of Gas to be delivered to DTEG at the Delivery Point at DTEG's or the downstream pipeline's prevailing line pressure, but not to exceed the DTE Gathering's maximum allowable operating pressure (MAOP). DTE Gathering shall defend, indemnify and hold DTEG harmless from any and all claims, damages, losses, liens, judgments and expenses (including attorney's fees) arising out of or in any way related to DTE Gathering delivering Gas at pressure in excess of the MAOP of the AEP. DTE Gathering is not installing any regulation facilities and DTEG must design its facilities to meet or exceed the MAOP of the AEP at the connecting flange at the outlet of the meter station.

## SECTION II

## MEASUREMENT AND MEASUREMENT EQUIPMENT

2.1 The Parties agree that measurement shall be as follows:

A. Measurement

i. The unit of volume for the purpose of measurement shall be one Mcf at a pressure base of 14.65 psi and a temperature base of 60 °F.

ii. The average atmospheric (barometric) pressure at each Delivery Point shall be assumed to be fourteen and four-tenths (14.4) pounds per square inch, irrespective of the actual location or elevation above sea level of the Delivery Point or of any variation in actual atmospheric pressure from time to time.

iii. The flowing temperature of the Gas(es) shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 9.

iv. The static pressure of the Gas(es)at the tap for each Receipt Point shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 9.

v. The supercompressibility factor used in computing the volume of Gas delivered through a meter shall be determined in a manner consistent with the method contained in the American Gas Association "Manual for the Determination of Supercompressibility Factors for Natural Gas (AGA Report No. 8, Detail Method)" as such publication may be revised from time to time.

vii. The gas analysis, specific gravity, heating value, and mole percentage of the components of the Gas used in computing the volume of Gas delivered shall be determined at intervals of at least thirty (30) days and not to exceed forty five (45) days by means of an instrument(s) of standard manufacture accepted in the industry for this purpose using a sample of Gas, or a representative sample of Gas, of the Gas stream flowing to the Delivery Point(s). If a valid sample cannot be obtained and processed without issue, then the last valid sample will be used until such a time as a valid sample can be successfully obtained and processed. Installation of and continual use of a gas chromatograph at any Delivery Point(s) may be substituted for the other gas analysis provisions under this Section.

B. Measurement Equipment

i. The volume of Gas delivered at each Delivery Point shall be measured by utilizing an ultrasonic meter designed, installed, maintained and operated as recommended in the latest issue of the American Gas Association Gas Measurement Report No. 9, entitled "Measurement of Gas by Multipath Ultrasonic Meters", as such publication may be revised from time to time (hereinafter referred to as "AGA Report No. 9") (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of DTEG).

ii. Any auxiliary measuring equipment, if utilized, shall be installed, maintained and operated in accordance with generally accepted industry practices. Chromatographs calculating the heating value (Btu) of the gas shall be programmed having the Gas Processors Associated (GPA) Standard 2145 Table of Paraffin Hydrocarbons and Other Components of Natural Gas and will have a pressure base of 14.65 psi.

iii. The volume of Gas delivered at each Delivery Point shall be calculated by means of an electronic flow computer located at each Delivery Point. The volume of Gas delivered through the meter shall be computed in the manner recommended in AGA Report No.9, properly using all factors set forth therein.

iv. The operator, for purposes of this Section, shall be MGAT Parties. All flow, measuring, testing and related equipment shall be of standard manufacture and type approved by MGAT Parties. DTEG may install check measuring equipment, provided that such equipment shall be installed so as not to interfere with the operations of MGAT Parties.

DTEG, in the presence of MGAT Parties shall have access to measuring equipment at all reasonable times, but the reading, calibrating and adjusting thereof shall be done by MGAT Parties. DTEG shall have the right to be present at the time of the installing, reading, cleaning, changing, repairing, inspecting, testing, calibrating or adjusting done by MGAT Parties. The records from such measuring equipment shall remain the property of MGAT Parties, but upon request, DTEG may request copies of the records, if any, together with calculations therefrom for inspection, subject to return within ten (10) working days after receipt thereof or longer if extended by mutual agreement. Reasonable care shall be exercised in the installation, maintenance and operation of the measuring equipment to avoid any inaccuracy in the determination of the volume of Gas received and delivered. The components of the electronic measurement system shall be calibrated once every ninety (150) days but not to exceed one hundred twenty (185) days pursuant to Section viii below. If MGAT Parties fails to perform the verification and testing, then DTEG shall have the right to cease or temporarily discontinue Gas Transportation Service under this Agreement relative to such measuring equipment. If either Party at any time desires a special test of any measuring equipment, it will promptly notify the other Party and the Parties shall then cooperate to secure a prompt verification of the accuracy of the equipment. The expense of any special test shall be borne by the Party requesting it if the measuring equipment is found to be in error by not more than 2% error in the aggregate. If, upon any test, any measuring equipment is found to be in error, such errors shall be taken into account in a practical manner in computing the deliveries. If the resultant aggregate error in the computed receipts or deliveries is not more than 2% error in the aggregate as measured during a calibration, then previous receipts or deliveries shall be considered accurate. All equipment shall, in any case, be adjusted at the time of testing to record correctly. If, however, the resultant aggregate error in computing receipts or deliveries exceeds 2 % error in the aggregate as measured during a calibration, then the previous recordings of such equipment shall be corrected to zero error for any period that is known definitely or agreed upon, but in case the period is not known definitely, or agreed upon, the correction shall be for the period extending over one-half of the time elapsed since the date of the last test.

v. In the event any measuring equipment is out of service, previous recordings of receipts or deliveries through such equipment shall be corrected using the following procedures:

(a) by using the registration of any check meter or meters, if properly installed to the standards identified herein and accurately registering, or in the absence of (a);

(b) by correcting the error if the percentage of error is ascertainable by calibration, special test or mathematical calculation, or in the absence of both (a) and (b) then;

(c) by estimating the quantity of receipt or delivery based on receipts or deliveries during preceding periods under similar conditions when the meter was registering accurately.

The correction period shall not exceed twelve (12) Months from the most recent test.

vi. If at any time during the term of service a new method or technique is developed with respect to gas measurement or the determination of the factors used in gas measurement, the new method or technique may be substituted upon MGAT Parties' sole discretion.

vii. The Parties agree to preserve for a period of at least two (2) years or such longer period as may be required by the applicable, valid requirements of any governmental bodies having or asserting jurisdiction, all test data, and other similar records.

viii. Electronic Gas Measurement (EGM) Technical Requirements

(a) Accuracy: The meter system should use instruments that will provide an overall measurement accuracy of + or - 0.5% of flow, taking into account all the sources of error, including calibrated span of instruments, linearity, hysteresis, repeatability, ambient temperature, stability, vibration, and power supply fluctuation. Generally, this accuracy can be achieved only by the use of high accuracy smart transmitters with a published accuracy of ± 0.1%.

Differential Pressure Transmitters shall be of a type that self-compensate for static pressure effect or manufacturer's published compensation factor shall be programmed into the flow computer ("RTU").

All instruments should operate on a temperature range of negative 30 degrees Fahrenheit to positive 120 degrees Fahrenheit. The unit must be able to withstand mechanical shock of at least 1 G and DTEG will to be held responsible for any accidental damage to the equipment as a result of mechanical shock of over 1 G.

All equipment shall be installed per the specifications identified in AGA-9and AGA-8 documents.

(b) Computation: The flow computer of the meter system shall as a minimum perform flow calculation per AGA-9 requirements. As the aforementioned calculation methods are revised from time to time, new releases shall be implemented within twelve Months from the release data. Any costs related to the implementation of such upgrades shall be recovered from the DTEG. All other methods of computation must be approved by both DTEG and MGAT Parties. All measured variables for static pressure and temperature shall be sampled at least once per second. All volume calculations shall be made at least once per second.

(c) Data Security: The RTU must have password protection before data can be accessed or any parameters can be changed.

(d) Safety: The EGM system must meet standards for Class I, Division 2, Group D installations.

(e) Power: The RTU and the related hardware should run on re-chargeable batteries. These batteries can be charged by 20 VAC, 24 VDC or solar panels. For previously installed equipment, the battery capacity shall not be less than eight (8) hours. For future EGM installation, the battery capacity shall be at least twenty-four (24) hours when fully charged.

(f) Local Display: DTEG shall be provided with capability to monitor volume information being recorded by measurement system on an ongoing basis with either RTU display or transmitters with local display.

(g) All test and calibration equipment shall be certified to 0.1% accuracy and traceable back to an NIST primary standard. All test and calibration equipment shall be re-certified at least annually. In addition, MGAT Parties shall perform such inspections and test of the accuracy of the equipment used in the EGM system calibrations. A copy of any inspection test of certification report for the meter that measures DTEG's Gas, whether performed by MGAT Parties or a third party, shall be made available to DTEG personnel upon written request. After reasonable notice and request, MGAT Parties shall provide DTEG with documentation on the tests and inspection and the annual certification planned for the equipment used to calibrate the EGM equipment. Calibration equipment must satisfy all applicable safety codes for the location in which it is being used, or the area must be checked and confirmed as gas free (less than 5 % LEL) prior to and during use.

A full loop (end device through RTU) test/calibration is required on all ANALOG inputs. Any adjustments to or calibration of the equipment shall be documented and kept as part of the audit trail. Provisions shall be made for DTEG to tap into meter run with an electronic transmitter for periodic calibration comparison, provided, however, any such tap shall be done with permission from MGAT Parties and shall not interfere with MGAT Parties' measurement operations at that point. The flow computer and/or RTU shall freeze the analog transmitter values during transmitter calibration and orifice plate removal and use the frozen values for the flow computation during calibration and orifice plate removal and re-installation.

(h) Audit: The following information must be kept for a minimum of two (2) years following the calendar year of production, or such longer period as may be required by the applicable, valid requirements of any governmental bodies having or asserting jurisdiction:

(1) All calculated volumes, energies, and daily averages must be maintained in their original unaltered form.

(2) Any changes to the data to correct for inaccuracies must be fully documented, including assumptions and factors used in calculating the adjustment.

All audit information will be available to DTEG personnel during normal business hours, upon reasonable notice and request.

ix. If, after two consecutive months of operations, the meter is operating at less than 10% of the design capacity, MGAT Parties may require that the flow be shut in or the meter station be redesigned to accurately measure the quantity of Gas at DTEG's expense.

x. If, after two consecutive months of operations, the meter is operating at greater than 90% of the design capacity, MGAT Parties may require that the flow be shut in or the meter station be redesigned to accurately measure the quantity of Gas at DTEG's expense.

SECTION III

GAS QUALITY SPECIFICATIONS

Unless prior approval is obtained from DTE Parties, all Gas received and delivered under the terms of this Agreement must conform to the following specifications:

(a) The Gas must be commercially free from dust, gum, gum-forming constituents, and all other solid and liquid matters which may interfere with its merchantability or cause injury to or interfere with proper operation of the pipelines, regulators, meters or other appliances through which it flows;

(b) The Gas may not contain anything which might adversely affect the safe and efficient operation of DTE Parties' downstream facilities;

(c) The water content of the Gas may not exceed 5 pounds per million cubic feet;

(d) The Gas may contain oxygen according to the requirements of the Gas Transportation Oxygen Content;

(e) At any Receipt Point, the carbon dioxide content of the Gas may not exceed two mole percent (2%), unless Shipper can demonstrate that it has downstream treating agreements satisfactory to DTE Parties which provide that the carbon dioxide content of the gas will not exceed two mole percent (2%) at the outlet of the treating plant, in which case the carbon dioxide content may not be excessive in DTE Parties' sole opinion;

(f) The Gas may not contain more than 1/4 grain of hydrogen sulfide per 100 cubic feet;

(g) The Gas may not contain more than 1/2 grain of mercaptan sulfur per 100 cubic feet;

(h) The Gas may not contain more than 5 grains of total sulfur per 100 cubic feet, including the sulfur in any hydrogen sulfide, mercaptan, sulfides and residual sulfur;

(i) The Gas redelivered at each Delivery Point must have a total heating value per cubic foot of not less than 950 BTU at a base pressure of 14.65 pounds per square inch at 60 degrees Fahrenheit on a dry basis. If the Gas has been included in a downstream Gas treating agreement, the Gas at each Receipt Point must have a reasonable total heating value per cubic foot in DTE Parties' sole opinion;

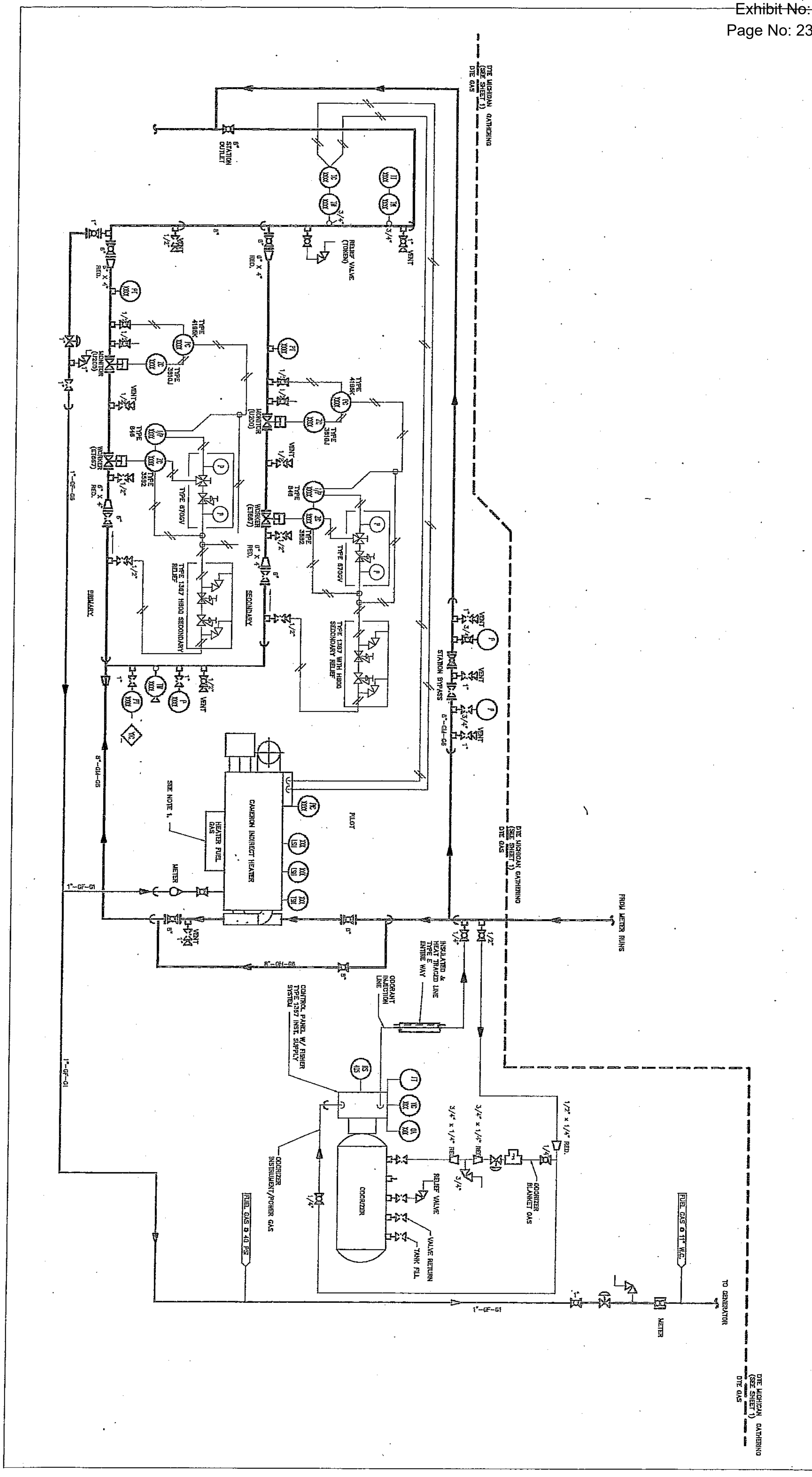
(j) In the event the Gas delivered by Shipper at the Receipt Point(s) fails at any time to meet these quality specifications, DTE Parties shall notify Shipper of such deficiency and thereupon may, at its option, refuse to accept deliveries pending correction. Upon demonstration acceptable to DTE Parties that the Gas being tendered for delivery meets these quality specifications or that Shipper has arranged for the necessary treatment, processing or other action required for the Gas to meet these quality specifications, DTE Parties shall commence or resume, as the case may be, taking delivery of Gas;

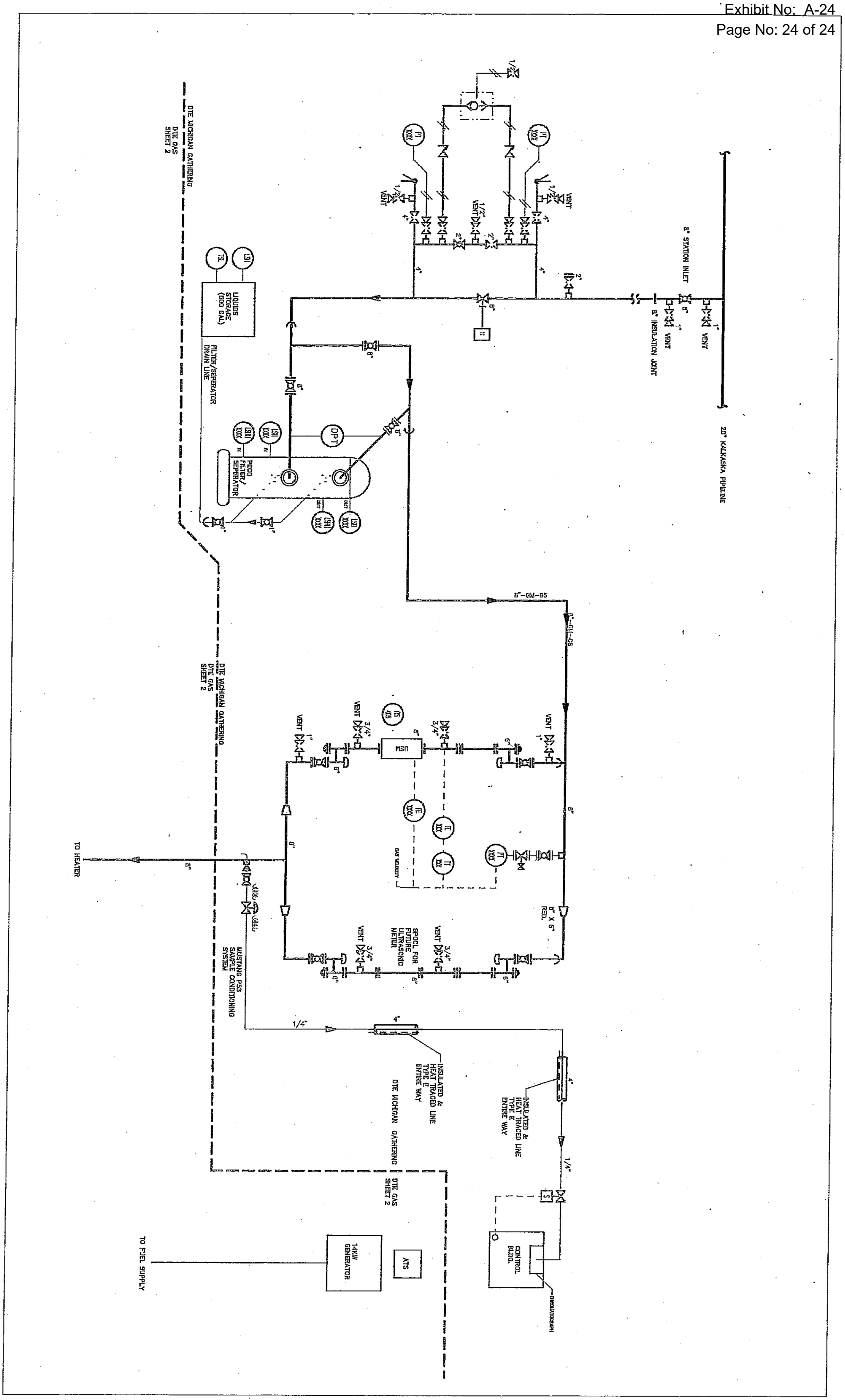
(k) Shipper agrees to indemnify and hold DTE Parties harmless for any and all liability resulting from DTE Parties' movement of Gas received by Shipper which fails to meet the specifications hereunder and which have not been waived in writing by DTE Parties, including contamination or damage to other Gas being transported.

# Exhibit A

## Delivery Point Facilities

See attached.




20" KALKASKA PIPELINE
8" STATION INLET
8" INSULATION JOINT
VENT
LIQUIDS STORAGE (500 GAL)
FILTER/SEPERATOR DRAIN LINE
PECO FILTER/ SEPERATOR
DPT
DTE MICHIGAN GATHERING
DTE GAS SHEET 2
8"-GM-GS
USM
SPOOL FOR FUTURE ULTRASONIC METER
GAS VELOCITY
8" X 6" RED.
TO HEATER
MUSTANG P53 SAMPLE CONDITIONING SYSTEM
INSULATED & HEAT TRACED LINE TYPE E ENTIRE WAY
CONTROL BLDG.
ATS
14KW GENERATOR
TO FUEL SUPPLY

**ASAT: 62078**

# GAS TRANSPORTATION AGREEMENT

## DTE MICHIGAN GATHERING COMPANY AND

## DTE GAS COMPANY

**Dated November 1, 2014**

# GAS TRANSPORTATION AGREEMENT

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**DTE MICHIGAN GATHERING COMPANY**
**GAS TRANSPORTATION AGREEMENT**

**THIS AGREEMENT** is entered into as of this 1st day of November, 2014, ("Effective Date") by and between DTE GAS COMPANY ("Shipper"), having an office at One Energy Plaza, 2130 WCB, Detroit, Michigan 48226 and DTE MICHIGAN GATHERING COMPANY ("DTE Gathering"), having its principal offices at One Energy Plaza, Detroit, Michigan 48226. Shipper and DTE Gathering may be referred to collectively as "Parties" and individually as "Party".

RECITALS

**WHEREAS** Shipper has requested that DTE Gathering transport Gas on Shipper's behalf;

**WHEREAS** Shipper and DTE Gathering have mutually agreed to adjust the rate and other terms as identified in this Agreement; and

**WHEREAS** DTE Gathering is willing to provide the requested transportation service subject to the terms and conditions contained in this Agreement;

**NOW, THEREFORE,** in consideration of the mutual promises, agreements and undertakings in this Agreement, Shipper and DTE Gathering agree as follows:

**ARTICLE I**

**DEFINITIONS**

1.1. "Agreement" means this Gas Transportation Agreement together with Exhibit A – Receipt Points ("Exhibit A"), Exhibit B- Delivery Points ("Exhibit B"), Exhibit C- Gas Transportation Terms ("Exhibit C"), and Exhibit D- Antrim Oxygen Procedures ("Exhibit D").

1.2. "Antrim Gas" means natural gas produced from the Antrim shale formation.

1.3. "Antrim Expansion Project" or "AEP" means the pipeline expansion project as filed by DTE Gathering in the Michigan Public Service Commission Case No. U-10547, which includes (i) the utilization of a portion of DTE Lateral's Northern Michigan Wet Header gathering system for purposes of providing transportation, and (ii) transportation on the DTE Lateral lateral pipelines.

1.4. "Btu" means British Thermal Unit, which is the quantity of heat necessary to raise one pound of water one degree Fahrenheit and is exactly equal to 1055.056 joules.

1.5. "Capital Repair Threshold" shall have the meaning as defined in Section 5.1.3.

1.6. "$CO_2$" means carbon dioxide.

1.7. "Commission" or "MPSC" means the Michigan Public Service Commission or any successor thereto.

1.8. "Cubic Feet of Gas" means that quantity of Gas which occupies one cubic foot at a temperature of 60 degrees Fahrenheit and at a pressure of 14.65 Psia.

1.9. "Gas Day" means a period of 24 consecutive hours beginning at 10:00 AM Eastern Time (Standard or Daylight Savings) of one calendar day and ending at 10:00 AM Eastern Time (Standard or Daylight Savings) on the next following calendar day. The reference date for any day shall be that of its beginning.

1.10. "Delivery Point(s)" means the points set forth on Exhibit B, attached hereto, at which DTE Gathering shall redeliver Equivalent Quantities of Gas to Shipper.

1.11. "DTE Gas" means DTE Gas Company.

1.12. "DTE Lateral" means DTE Michigan Lateral Company.

1.13. "eNominator" means DTE Gas's electronic gas nomination system or any successor program used to perform nominations of gas flows.

1.14. "Equivalent Quantity(ies)" means the volume of Gas delivered by or for the account of Shipper to DTE Gathering on any day pursuant to this Agreement multiplied by a fraction, the numerator of which is the average heating value per Mcf of the Gas delivered or caused to be delivered by Shipper at a pressure base of 14.65 psia and the denominator of which is the average heating value per Mcf at a pressure base of 14.65 psia of the Gas redelivered on the same day by DTE Gathering, less any amount withheld by DTE Gathering for Gas-in-Kind and Shrink.

1.15. "Excess Major Capital Repair Cost Amount" shall have the meaning given in Section 5.1.3.

1.16. "Gas" means Antrim Gas and all other gas delivered for transportation services under this Agreement.

1.17. "Gas-in-Kind" means 0.12% of all quantities of Gas delivered by Shipper on the AEP, unless otherwise modified by the MPSC.

1.18. "Gas Transportation Charge" means the currently effective transportation rate on the AEP as identified in Article V.

1.19. "Gas Transportation Service" means transportation service provided by DTE Gathering on the AEP for Shipper on a daily basis pursuant to the terms and conditions set forth in this Agreement.

1.20. "Lateral Charge" means the rate for transportation of Gas on DTE Lateral's lateral pipelines.

1.21. "Major Capital Repair Costs" means costs and expenses actually and reasonably incurred by DTE Gathering related solely to capital repairs to pipelines, fixtures, appurtenances, and equipment that are necessary for the continuous and safe operation of the AEP; provided, however that inspection and diagnostic costs, including without limitation costs of running a smart pig, are excluded from Major Capital Repair Costs as defined herein.

1.22. "Mcf" means 1,000 Cubic Feet of Gas at a pressure base of 14.65 psia.

1.23. "MMBtu" means one million Btu.

1.24. "Month" means the period commencing on the first Gas Day of a calendar month and extending until commencement of the first Gas Day of the next following calendar month.

1.25. "Overrun Charge" shall have the meaning as defined in Section 5.1.5.

1.26. "Prime Rate" means the rate announced by JP Morgan Chase Bank (or its successor) from time to time as its prime commercial lending rate, or if the prime rate is discontinued, the rate announced from time to time as that being charged to its most creditworthy commercial borrowers for ninety (90) day unsecured loans.

1.27. "Receipt Point(s)" means the points set forth on Exhibit A, attached hereto, at which Shipper may deliver Gas to DTE Gathering.

1.28. "Shrink" means the measured volumetric and Btu reduction for removal of CO2 to meet the requirements of the Gas Quality Specifications in Section VI of Exhibit C for transportation of the Gas, and Shippers proportionate share shall be determined by the ratio that the Shipper's calculated CO2 bears to the total of all shippers' calculated CO2.

1.29. "Surcharge Volume" means the total volume of gas transported on the AEP for the twelve (12) month period ending on the last day of the month prior to the date that the total aggregate Major Capital Repair Costs incurred exceed $400,000.

1.30. "Transportation Surcharge" shall have the meaning defined in Section 5.1.3.

1.31. "Unauthorized Overrun Gas" shall have the meaning as defined in Section 5.1.5.

## ARTICLE II

## DEDICATION OF RESERVES

2.1 Before any Antrim Gas is transported on a firm basis pursuant to this Agreement, the party who owns or controls the acreage from which the Antrim Gas is produced shall dedicate all previously undedicated Antrim Gas reserves which it owns and controls, and which can be reasonably serviced by the AEP. Antrim Gas which is produced from controlled acreage or acreage acquired after execution of this Agreement (unless previously otherwise dedicated) must also first be dedicated to the AEP before it will be transported on a firm basis. Such dedications must be made on a form provided or approved by DTE Gathering. DTE Gathering may refuse firm service for any Antrim Gas which has not been dedicated as provided above.

## ARTICLE III

## TERM

3.1 This Agreement will be in effect until November 30, 2014, and will continue in effect from month to month thereafter until terminated by either Party giving written notice to the other at least thirty (30) days.

## ARTICLE IV

## GAS TRANSPORTATION

4.1 Shipper shall deliver or cause to be delivered to DTE Gathering at the Receipt Points, Gas for Gas Transportation Service up to a maximum daily quantity ("MDQ") of 100,000 Mcf. DTE Gathering shall provide Gas Transportation Service for Shipper or for the account of Shipper and shall redeliver an Equivalent Quantity of Gas at the Delivery Points nominated pursuant to this Agreement. Gas Transportation Service shall be provided in accordance with Exhibit C, Section I.A.

4.2 DTE Gathering shall retain Gas-in-Kind provided, however, that if the Delivery Point for Shipper's Gas is into DTE Gas's transmission and distribution pipeline system, then the Gas-in-Kind shall be borne by DTE Gas or the downstream shipper. Gas-in-Kind and Shrink will be calculated and withheld from the quantity of Gas that is redelivered for the account of Shipper at each Delivery Point, based on the nominated volume of Gas at the Delivery Point.

## ARTICLE V

## RATES

5.1 Shipper shall pay DTE Gathering a Monthly amount for transportation as follows:

5.1.1 A Monthly Customer Administrative Charge of $300 for each Agreement Shipper and DTE Gathering execute for transportation service.

5.1.2 A basic charge equal to the volumes of Gas in Mcf units received by DTE Gathering from Shipper at the Receipt Points and transported for or on behalf of Shipper during the Month, multiplied by the Gas Transportation Charge, which shall be $0.035/Mcf which includes a depreciation rate of $0.0029/Mcf.

5.1.3 If at any time after the Effective Date the total aggregate Major Capital Repair Costs incurred exceed $400,000, DTE Gathering shall be entitled to charge a Transportation Surcharge The amount of the Transportation Surcharge shall be calculated by multiplying the total aggregate Major Capital Repair Costs incurred during the Settlement Term in excess of $400,000 (the "Excess Major Capital Repair Cost Amount") by twenty percent (20%), and dividing that result by the Surcharge Volume; provided, however that in no event shall the amount of the Transportation Surcharge ever exceed $0.005 per Mcf ("Capital Repair Threshold"). The Parties agree that the Transportation Surcharge may be subject to periodic recalculation if additional Major Capital Repair Costs are incurred, subject to the Capital Repair Threshold. Book depreciation of the capital expenditures occurring on or after the effective date of this Agreement shall be at a fixed thirty (30) year rate.

Notwithstanding the foregoing, DTE Gathering is not required to make any capital investment in facilities under this Section that it determines would result in an increase in the rate of more than $0.005/Mcf at any time.

5.1.4 A charge for transportation on DTE Lateral's lateral pipelines equal to the quantities of Gas transported on the lateral pipelines multiplied by the Lateral Charge.

5.1.5 An Overrun Charge, for any amounts that exceed Shipper's MDQ on any Gas Day ("Unauthorized Overrun Gas"), equal to the sum of $3.20 per Mcf multiplied by such Unauthorized Overrun Gas; provided, however, no Overrun Charge will be charged under the following circumstances:

a. in any Month where Shipper, after meeting the criteria set forth in 5.1.6 delivers Gas in excess of its MDQ ("Authorized Overrun Gas");

b. in any Month where the daily quantities in excess of the MDQ averages no more than five percent (5%) above the MDQ plus any Authorized Overrun Gas; or

c. in circumstances where Gas delivered in excess of the MDQ occurred temporarily for less than a 24-hour period and resulted from an inadvertent surge or increase of Gas from Shipper's facilities due to equipment failure. However, only one such failure will be allowed during any calendar Month. Shipper shall promptly notify DTE Gathering within two (2) business days of the occurrence under this provision or it shall be considered Unauthorized Overrun Gas.

5.1.6 Shipper may deliver to DTE Gathering Authorized Overrun Gas if Shipper has obtained DTE Gathering's written permission to flow Gas in excess of Shipper's MDQ prior to submitting a nomination. Permission to flow Authorized Overrun Gas will be granted unless the AEP is transporting firm Gas at the currently existing pipeline capacity.

5.1.7 If DTE Gathering is not able to transport Shipper's nominated quantity of Gas up to Shipper's MDQ due to Unauthorized Overrun Gas on the system, Shipper shall receive, on a calendar year quarterly basis, its proportionate share of 80% of the actual funds DTE Gathering collects as Overrun Charges from all Shippers. Shipper's proportionate share will be an amount equal to Shipper's quantity of Gas, up to its MDQ, that did not flow during the calendar quarter as a result of Unauthorized Overrun Gas divided by the total quantity of Gas that did not flow on the AEP because of Unauthorized Overrun Gas during the calendar quarter.

5.2 All charges set forth in this Article V, except the Monthly Customer Administrative Charge, will be applied to quantities in units of Mcf delivered at the Receipt Point as measured in accordance with the terms of Exhibit C, Section V.

## ARTICLE VI

## NOMINATIONS, DELIVERIES

6.1 Shipper must nominate all quantities of Gas that will be transported pursuant to this Agreement and as further detailed in Exhibit C, Section II.

## ARTICLE VII

## RECEIPT POINT(S)

7.1 Shipper shall deliver or cause to be delivered Gas at the Receipt Point(s). All Gas delivered to DTE Gathering must meet the quality specification set out in Exhibit C, Section VI.

7.2 DTE Gathering, at its sole discretion, may refuse to accept Gas at any Receipt Point(s) that is not subject to an executed Receipt Point Agreement between DTE Gathering and the party responsible for the Receipt Point.

7.3 DTE Gathering agrees that the Receipt Point fees under its Antrim Receipt Point Agreement(s) ("Receipt Point Agreement") for deliveries into the AEP shall be $225 on a monthly basis from the Effective Date of this Agreement. The Parties further acknowledge that the Receipt Points are an integral part of the AEP and will continue to be operated by DTE Gathering. In the event of a conflict between this Agreement and the Receipt Point Agreement relating solely to the monthly fee, this Agreement shall control.

## ARTICLE VIII

## DELIVERY POINT(S)

8.1 For all Gas delivered by Shipper to DTE Gathering at the Receipt Points, DTE Gathering shall redeliver to Shipper, or for the account of Shipper, Equivalent Quantities of Gas at the Delivery Point(s).

## ARTICLE IX

## DISPOSITION OF GAS

9.1 Because of the inability of DTE Gathering and Shipper to maintain precise control over the rate of flow and quantities of Gas to be received and delivered, the Parties shall exercise reasonable efforts to keep Gas receipts and deliveries in balance. DTE Gathering will use Electronic Gas Measurement ("EGM") for any Receipt Point under this Agreement.

9.2 DTE Gathering may commingle Gas delivered under this Agreement with Gas owned by DTE Gathering and/or transported by DTE Gathering for others if the resulting commingled gas stream meets the Delivery Point quality specifications in Exhibit C or any quality specifications subsequently authorized by the MPSC.

## ARTICLE X

## POSSESSION, INDEMNITY AND LIMITATION ON LIABILITY

10.1 As between the Parties, Shipper is deemed to be in exclusive control and possession of the Gas transported under this Agreement and is responsible and shall defend, hold harmless and indemnify DTE Gathering for any damage or injury caused thereby until the Gas is delivered by Shipper to DTE Gathering at the interconnection with the Antrim Expansion Project and after it is redelivered by DTE Gathering at the Delivery Point(s). Except for Shipper's indemnity obligation as provided in Sections II.C. and VI.(k) of Exhibit C, DTE Gathering is deemed to be in exclusive control and possession of the Gas and responsible and shall defend, hold harmless and indemnify Shipper for any damage or injury caused thereby after it is delivered to DTE Gathering, by Shipper or for Shipper's account, at the interconnection with the Antrim Expansion Project, and before it is redelivered by DTE Gathering at the Delivery Point(s).

10.2 Neither Party shall be liable to the other for consequential incidental, exemplary, punitive or indirect damages arising out of the performance or non-performance of any obligation under this Agreement, by statute, in tort or contract, under any indemnity provision or otherwise.

## ARTICLE XI

## DELIVERY PRESSURE

11.1 DTE Gathering has no obligation to receive Gas at Receipt Points from Shipper unless such Gas is delivered at sufficient pressure to meet DTE Gathering's prevailing line pressure, but not to exceed DTE Gathering's maximum allowable operating pressure ("MAOP") or that of any third party pipeline into which such Receipt Point interconnects. Shipper has no obligation to receive quantities of Gas, or cause quantities of Gas to be received by a third party transporter under this Agreement, unless such Gas is delivered at pressures set forth in Exhibit B for each Delivery Point. DTE Gathering has no obligation to compress the Gas it transports in order to redeliver such Gas at the Delivery Point.

## ARTICLE XII

## WARRANTY OF RIGHT TO DELIVER

12.1 Shipper warrants that at the time of delivery it has the right to deliver the Gas to DTE Gathering at the Receipt Point(s) and shall indemnify, defend, and save DTE Gathering harmless from suits, actions, debts, accounts, damages, costs, losses and expenses arising from or out of claims of any and all persons to the Gas or to royalties, taxes, license fees or charges thereon.

## ARTICLE XIII

## TAXES

13.1 Shipper shall pay all taxes, tariffs, and duties however designated, levied, or charged resulting from services provided under this Agreement, including, without limitation, all state and local privilege or excise taxes, and any amount in lieu of such taxes, tariffs and duties paid or payable by DTE Gathering, exclusive however of taxes based on the income of DTE Gathering and property taxes. Shipper shall reimburse DTE Gathering for any such taxes, tariffs and duties which are collected and remitted or paid on Shipper's behalf by DTE Gathering because of Shipper's failure to pay.

## ARTICLE XIV

## BILLING AND PAYMENT

14.1 On or before the twentieth (20th) day of each calendar Month, DTE Gathering will render a statement and supporting documentation to Shipper based on the applicable charges set forth in Section 5.1 for the previous calendar Month. Shipper shall tender payment to DTE Gathering for the amount billed in the statement on or before the later of (i) the 25th day of the Month in which the statement was received or (ii) ten (10) days after receipt of the statement. All payments must be made by wire transfer directed to a bank account designated by DTE Gathering.

14.2 The statements rendered pursuant to this Agreement will be denominated in U.S. Dollars ($U.S.), and all payments must be made in $U.S.

14.3 Shipper has the right at all reasonable times to examine the books and records of DTE Gathering to the extent necessary to verify the accuracy of any statement, charge or computation made under or pursuant to any provisions of this Agreement.

14.4 Shipper shall notify DTE Gathering of any disputed amount in any statement and provide a reasonable basis for such dispute, so that reasonable efforts may be made to resolve the dispute as quickly as possible.

14.5 If Shipper fails to pay any amount in any statement rendered by DTE Gathering that is not in dispute when such amount is due, unless otherwise agreed by Shipper and DTE Gathering, interest will accrue on the unpaid, undisputed amount at a rate equal to the Prime Rate from the due date until the date of payment. If any disputed amount is not resolved within forty-five (45) days of the due date for such statement, interest will accrue on the unpaid disputed amount at a rate equal to the Prime Rate from the due date until the date of payment.

14.6 If either DTE Gathering or Shipper discovers any error or inaccuracy in invoices, statements, billings, payment, calculations or determinations under this Agreement, then proper adjustment and correction thereof will be made as promptly as practicable. If errors or inaccuracies are not identified by either Shipper or DTE Gathering and reported to the other Party within twenty-four (24) Months from the date of such invoices, statements, billings, payments, calculations, or determinations, the same are deemed conclusively to be correct.

14.7 If Shipper fails to pay the undisputed amount of any invoice when it is due, DTE Gathering may, after ten (10) days prior notice, suspend transportation services to Shipper until such amount is paid.

## ARTICLE XV

## NON-WAIVER OF FUTURE DEFAULTS

15.1 No waiver by either Party of any one or more defaults by the other in the performance of any provision of this Agreement will operate or be construed as a waiver of any future default or defaults, whether of a like or a different character.

## ARTICLE XVI

## FORCE MAJEURE

16.1 Neither Shipper nor DTE Gathering will be liable in damages, or in any other remedy, legal or equitable, to the other for failure to perform obligations under this Agreement due to any force majeure event, which is defined as any act, omission or circumstances occasioned by or in consequence of any acts of God, strikes, lockouts, acts of the public enemy, wars, sabotage, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, arrests, restraints of rulers and peoples, civil disturbances, explosions, breakage or accident to machinery, lines of pipe, wells, flowlines, production facilities or related equipment, or $CO_2$ treating plants or the necessity to make unscheduled shutdowns (for purposes of necessary maintenance, repairs, tests, or alterations to machinery, lines of pipe or $CO_2$ treating plants), well or line freezeups, the binding order of any court or governmental authority which has been resisted in good faith by all reasonable legal means, or any other cause, whether of the kind herein enumerated, or otherwise, not within the control of the party claiming force majeure, and which by the exercise of due diligence such party is unable to prevent or overcome. A failure to settle or prevent any strike or other controversy with employees or with anyone purporting or seeking to represent employees shall not be considered to be a matter within the control of the party claiming force majeure.

16.2 Any force majeure event affecting the performance of this Agreement by either Party, however, will not relieve such party of liability (i) in the event of its continuing negligence; (ii) in the event of its failure to use due diligence to remedy the event of force majeure and to remove the cause of such force majeure in an adequate manner and with all reasonable dispatch or (iii) from its obligations to make payments of amounts then due thereunder, unless such party gives notice and full particulars of the same in writing or by telecopy to the other party as soon as possible after the occurrence relied on.

## ARTICLE XVII

## LAWS, ORDERS, RULES AND REGULATIONS

17.1 The performance by the Parties of their obligations set forth in this Agreement shall be subject to all valid and applicable laws, orders, rules and regulations of any duly constituted authority having jurisdiction.

17.2 Authority for Gas Transportation Service under this Agreement is provided pursuant to 1929 PA 9, as amended (Act 9); MCL 483.101 et seq.

17.3 The Parties agree that the rates identified in Article 5 of this Agreement shall remain in effect for a period of seven (7) years from the Effective Date. Without limiting the foregoing, neither Party shall seek or impose any rate adjustment or other charge or requirement in any way inconsistent with the terms and conditions of this Agreement until seven (7) years from the Effective Date or the Parties mutually agree to modify or amend those terms and conditions in a written amendment.

17.4 THIS AGREEMENT IS GOVERNED BY THE LAW OF THE STATE OF MICHIGAN. IT IS AGREED THAT ANY AND ALL LITIGATION RELATED TO THIS AGREEMENT MUST BE BROUGHT IN EITHER A STATE OR FEDERAL COURT

LOCATED IN WAYNE COUNTY, MICHIGAN, AND EACH PARTY, FOR PURPOSES OF ANY SUCH LITIGATION, SUBMITS TO THE EXCLUSIVE JURISDICTION AND VENUE OF THAT COURT.

## ARTICLE XVIII

## NOTICE

18.1 Unless otherwise provided herein, all notices given hereunder by one Party to the other shall be sent to the addresses provided below by registered mail, overnight mail or by facsimile transmission and shall be effective upon receipt thereof. However, routine communications, including monthly statements, will be considered as duly delivered when mailed by either registered, overnight or ordinary mail.

SHIPPER:
DTE Gas Company
One Energy Plaza, 1600 WCB
Detroit, Michigan 48226
Attn: Robert Lawshe
Fax:

DTE GATHERING:
DTE Michigan Gathering Company
One Energy Plaza, 2130 WCB
Detroit, Michigan 48226
Attn: Manager Midstream Business Development
Fax: (313) 235-6450

18.2 Each Party may, by prior written notice to the other, change its address or addresses given above at any time.

## ARTICLE XIX

## CREDITWORTHINESS

19.1 Shipper shall demonstrate creditworthiness at the time of its request for service and, upon DTE Gathering's request at any time thereafter, if DTE Gathering has reasonable grounds for insecurity regarding the Shipper's performance under this Agreement, Shipper shall demonstrate creditworthiness. DTE Gathering is not required to commence service or to continue to provide service if Shipper, when requested by DTE Gathering to demonstrate creditworthiness, fails to do so to DTE Gathering's reasonable satisfaction. Creditworthiness will be based upon (1) a credit rating of investment grade defined as a rating of at least "BBB-" by Standard & Poor's Corporation, a rating of at least "Baa3" by Moody's Investors Service, or a rating of at least BBB- by Fitch; or (2) if public credit reports are not available, an equivalent rating of investment grade as determined by DTE Gathering based on the financial rating methodology, criteria and ratios for the industry of the Shipper as published by the above rating agencies from time to time. For purposes of credit evaluation, DTE Gathering will consider the following, as applicable: (i) audited financial statements; (ii) annual report; (iii) most recent filed statements with the Securities and Exchange Commission (or an equivalent authority) or such other publicly available information; (iv) for public entities, the most recent publicly available interim financial statements, with an attestation by its Chief Financial Officer, Controller or equivalent that such statements constitute a true, correct and fair representation of financial condition prepared in accordance with Generally Accepted Accounting Principles (GAAP) or equivalent; (v)publicly available credit reports from credit and bond rating agencies; (vi) private credit ratings, bank or trade references; (vii) past payment history to DTE Gathering; (viii) whether Shipper has filed for bankruptcy protection and/or is operating under any chapter of the bankruptcy laws; (ix) whether Shipper is subject to liquidation or debt reduction procedures such as an assignment for the benefit of creditors or any creditors' committee agreement; (x) whether Shipper's credit rating has been downgraded by a credit rating agency within the last six months and (xi) such other information as may be mutually agreed to by DTE Gathering and Shipper.

19.2 If DTE Gathering determines that Shipper is not creditworthy, then within five (5) business days of notice from DTE Gathering, Shipper shall provide DTE Gathering with one of the following credit alternatives (1) a corporate guaranty of all Shipper obligations from a creditworthy entity; (2) an irrevocable letter of credit in form and from an institution satisfactory to DTE Gathering; (3) prepayment for one Month service assuming Shipper will deliver its full MDQ each Month (deposit equal to 8.33% of Shipper's estimated annual bill), or (4) such other security, as reasonably determined by DTE Gathering, to be of a continuing nature and in an amount equal to such amounts which would be due for three Months service at Shipper's full MDQ. Shipper's obligation to provide credit assurance shall terminate only after all of Shipper's obligations to DTE Gathering have been satisfied and shall continue for as long as Shipper has unfavorable credit.

19.3 A guarantor shall be deemed creditworthy provided it has an investment grade rating for its long-term senior unsecured debt from at least two of the recognized rating agencies listed below. The minimum acceptable investment grade rating from each of the indicated rating agencies is Baa3 by Moody's, BBB- by S & P and BBB- by Fitch. A guarantor that is considered creditworthy at the time it provided the guaranty but, at a later date, no longer meets the creditworthiness standards of this Section will be required to provide other security acceptable to DTE Gathering within five (5) business days of notice from DTE Gathering that the guarantor fails to meet the creditworthiness standards of this Section.

## ARTICLE XX

## MISCELLANEOUS PROVISIONS

20.1 Assignment: Neither Party may broker, assign, convey or transfer its interests, rights and obligations under this Agreement without the prior written consent of the other Party, which shall not be unreasonably withheld provided that DTE Gathering may broker, assign, convey or transfer its interests, rights and obligations under this Agreement to an affiliate without the prior written consent of Shipper,

20.2 Reorganization: Any company which succeeds by purchase, merger, or consolidation to the properties, substantially or as an entirety, of Shipper or of DTE Gathering, as the case may be, will be entitled to the rights and will be subject to the obligations of its predecessor in title under this Agreement.

20.3 Successors and Assigns: This Agreement will be binding upon and enure to the benefit of the Parties and their respective successors and permitted assigns.

20.4 Headings: The headings used throughout this Agreement are inserted for convenience of reference only and are not be considered or taken into account in construing the terms or provisions hereof nor are they to be deemed in any way to qualify, modify or explain the effect of any such provisions or terms.

20.5 Gender, Number and Internal References : Unless the context otherwise requires, words importing the singular include the plural and vice versa, and words importing gender include all genders. The words "herein", "hereunder" and words of similar import refer to the entirety of this Agreement and not only to the Section in which such use occurs.

20.6 Entirety: This Agreement and Exhibit A, Exhibit B, Exhibit C and Exhibit D constitute the entire agreement between DTE Gathering and Shipper concerning the subject matter hereof. Any prior understandings, representations, promises, undertakings, agreements or inducements, whether written or oral, concerning the subject matter hereof not contained herein shall have no force and effect. This Agreement may be modified or amended only by a writing duly executed by both Parties.

**IN WITNESS WHEREOF,** the Parties have caused this Agreement to be executed as of the day and year first above written.

**DTE MICHIGAN GATHERING COMPANY**

By: ____________________

Title: Manager Midstream Bus. Dev.

Date: 11/4/14

**DTE GAS COMPANY**

By: R. Lawsler

Title MANAGER GAS SUPPLY

Date: 10/31/2014

# EXHIBIT A
## RECEIPT POINTS

**Receipt Meter Name**

Kalkaska 30" T&D Line
(Kalkaska MichCon)

Service and availability of the Kalkaska 30" T&D Line receipt point is limited by the volumes of gas available for delivery at Kalkaska 30" T&D Line delivery point, as well as other operational considerations (i.e. measurement capability, pressure available, etc.) that may have an impact on the availability of gas at the Kalkaska 30" T&D Line location.

**EXHIBIT B**
**DELIVERY POINTS**

| Facility Name | Location | Pressure (psig) | Meter Capacity (MMcf/d) |
|---|---|---|---|
| DTE Gas 30" T&D Line (Kalkaska DTE Gas) | Kalkaska | 950 | 360 |
| Consumers Energy 12" T&D Line (GC-CE) | Goose Creek | 960 | 190 |
| ANR 36" Storage Line (Kalkaska –ANR) | Kalkaska | 950 | 150 |
| Great Lakes 36" Transmission Line | Goose Creek | 950 | 50 |

# EXHIBIT C

## GAS TRANSPORTATION TERMS



## I. SERVICE REQUESTS

A. Transportation Service provided pursuant to this Agreement will be offered on a firm basis until 100% of the capacity of the AEP is subscribed. Thereafter, service will be offered on an interruptible basis. DTE Gathering may provide service on an interruptible basis only to the extent capacity exceeds its firm commitments.

B. One year after the Effective Date of this Agreement, if for any consecutive twelve (12) Month period, Shipper transports an amount of Gas on a daily basis that averages less than ninety (90%) of Shipper's total MDQ, then DTE Gathering may adjust such MDQ downward to equal Shipper's daily average of transported quantities for such prior twelve Month period, unless Shipper provides DTE

Gathering with reasonable assurances that the average amount of gas that Shipper will make available for transportation within the next twelve (12) Months shall equal or exceed Shipper's MDQ. If a Force Majeure event occurred during any of the prior twelve (12) Month period, or if Shipper's MDQ was reduced during any of the prior twelve (12) Month period due to DTE Gathering's lack of capacity on the AEP, then such Month(s) shall be excluded and the next prior Month(s) used instead. Furthermore, if Shipper's transported quantities of Gas on a daily basis for a three (3) Month period exceed Shipper's total MDQ, then Shipper may request an increase of its MDQ, and DTE Gathering will, at the end of the calendar quarter, grant Shipper's request on pro rata basis with all other shippers' requests for MDQ increases subject to capacity restraints on the AEP.

II. NOMINATIONS, SCHEDULING and ALLOCATIONS

A. Nominations must be made via eNominator. Specific information to be included in the nomination is displayed within eNominator. Nominations are on an MMBtu basis.

B. Shipper, or its designated agent, shall nominate on eNominator the daily quantity of gas for delivery to DTE Gathering on behalf of Shipper. Nominations shall be submitted by 2:00 p.m. prior to the effective Gas Day.

C. Shipper's Agent. Shipper may designate an agent to nominate and schedule Gas Transportation Service on Shipper's behalf provided that such designation is in writing and provided to DTE Gathering or its affiliate (referred to collectively herein as the "DTE Parties"). Shipper shall indemnify, defend and save DTE Parties harmless from all suits, actions, debts, accounts, damages, costs, losses and expenses arising in any way from Shipper's agent's actions on behalf of Shipper.

D. Hourly Variation. Shipper shall maintain uniform hourly rates at all Receipt Points hereunder to the extent practicable.

E. Delivery of Gas. DTE Gathering shall make daily delivery of Equivalent Quantities of Gas, at each Delivery Point that Shipper nominates, provided, however, that Shipper may not take delivery of Gas for quantities it has not nominated and delivered to DTE Gathering at Receipt Point(s).

F. Scheduling and Allocation of Capacity. There are four service levels: firm, Authorized Overrun Gas, Unauthorized Overrun Gas, and interruptible. For each day, DTE Gathering will schedule receipts and deliveries of Gas on the basis of Shippers' confirmed nominations pursuant to the following:

i. If the AEP is not at full capacity due to the transportation of shippers' firm MDQ, then excess capacity will exist such that DTE Gathering is able to receive (a) Authorized Overrun Gas nominations in excess of a Shipper's MDQ, or (b) interruptible nominations;

ii. Unauthorized Overrun Gas shall occur when a Shipper exceeds its MDQ and fails to comply with the criteria set forth in Section 5.1.5 of the Agreement;

iii. Firm, Authorized Overrun Gas, or interruptible will be curtailed on a pro rata basis within each service category; however, any Authorized Overrun Gas is subordinate to firm and shall be curtailed if any other firm shipper(s) wish to nominate up to their MDQ; and further provided that any interruptible is subordinated to Authorized Overrun Gas and shall be curtailed if a firm shipper wishes to use Authorized Overrun Gas;

iv. DTE Parties may allocate Receipt Point capacity, if required, pro rata by confirmed nominations up to the firm MDQ at each Receipt Point;

v. DTE Parties may allocate transportation capacity, if required, pro rata by confirmed nominations up to the firm MDQ;

vi. DTE Parties shall allocate Delivery Point capacity, if required, pursuant to each shipper's transportation priority (firm, Authorized Overrun Gas, or interruptible) up to the MDQ at each Delivery Point. If allocation of Delivery Point capacity is required among shippers with firm priority, then such allocation will be based on each shipper's instructions to DTE Parties or on a pro rata basis if instructions are not received or conflict;

vii. In the event that Shipper is transporting Unauthorized Overrun Gas and DTE Gathering determines that it will curtail such Unauthorized Overrun Gas, then DTE Gathering may identify any volumes by Points of Receipt as the volumes that must be curtailed in order to bring Shipper into compliance with its MDQ.

G. Accounting for Receipts and Deliveries.

i. Following each Month, DTE Parties will forward to Shipper a report detailing Shipper's quantities in Mcfs and MMBtu.

ii. Allocation of Deliveries.

All deliveries will be allocated throughout the Month based on confirmed nominations at each Delivery Point. Delivery Point quantities allocated among Shippers will be reconciled at the end of each Month.

iii. Allocation of Receipts.

Where there is more than one shipper at a Receipt Point, then allocation of actual quantities will be made throughout the Month on a working interest percentage, based on Shipper's confirmed nominations for each such Receipt Point. Receipt Point quantities will be reconciled at the end of each Month.

iv. Electronic Information.

DTE Parties will operate its allocation procedures using electronic information available at Receipt Point(s) and/or Delivery Point(s). If such electronic information is not available on any day, then DTE Parties will assume that receipts and/or deliveries are equal to nominations, provided, however, that DTE Parties shall adjust such assumed receipts and/or deliveries to actual receipts and/or deliveries as soon as is reasonably practicable after the actual information becomes available. Any such prior period adjustments will not cause a penalty upon Shipper hereunder.

III. PAPER POOLING

A. Once DTE Parties have allocated Gas pursuant to this Agreement, then any over deliveries or under deliveries by Shipper at one Receipt or Delivery Point may be offset by underdeliveries or overdeliveries by Shipper at another Receipt or Delivery

Point, respectively ("Paper Pooling"). Such netting will be used by DTE Parties for determining any imbalance penalties under this Agreement.

B. Paper Pooling does not relieve Shipper from its obligation to make valid nominations or its obligation for Gas imbalances under the terms of this Agreement.

IV. MONTHLY IMBALANCES

A. At the end of each Month, DTE Parties will provide each shipper with a Gas imbalance statement for that Month ("Imbalance Month"), calculated on an MMBtu basis. Shipper will be afforded the opportunity to make up the imbalance during in the second Month following the Imbalance Month, as follows:

i. If the imbalance resulted from an overdelivery of Gas based on Receipt Point volumes less Gas-in-Kind and Shrink, then for the second Month following the Imbalance Month, Shipper shall nominate and receive for redelivery at the Delivery Point, volumes equivalent to the amount of the overdelivery.

ii. If the imbalance resulted from an underdelivery of Gas based on Receipt Point volumes less Gas-in-Kind and Shrink, then for the second Month following the Imbalance Month, Shipper shall nominate and deliver to the Receipt Point, volumes equivalent to the amount of the underdelivery.

iii. Gas nominated pursuant to Sections IV.A.i. and IV.A.ii. ("Pay-back Gas") must be the first Gas nominated for the second Month following the Imbalance Month. If Pay-back Gas is not the first gas nominated, DTE Parties, at its discretion, may refuse nominations for Shipper's Gas.

B. If at the end of any Month following an Imbalance Month, Shipper's net imbalance, after paper pooling, exceeds its confirmed nomination by a tolerance of ten percent (10%) or greater, then Shipper will incur an imbalance penalty of 10¢ per Mcf for the amount of the imbalance in excess of the ten percent (10%) tolerance. Such penalty will apply to any Gas imbalance not resolved by the end of the Month as provided in Section IV.A. above and for each Month thereafter until the imbalance is resolved.

C. If upon termination of this Agreement, Shipper has not caused to be delivered to DTE Gathering at the Receipt Points, quantities of Gas in MMBtu that are equal to those that Shipper has taken at the Delivery Point(s), plus those quantities retained by DTE Gathering as compensation for Gas-in-Kind, the term of this Agreement will be extended for a period of up to sixty (60) days during which time Shipper shall cause the deficient quantity to be delivered to DTE Gathering pursuant to this Agreement at a mutually agreeable daily rate of delivery. Should Shipper fail to correct this imbalance within the sixty (60) day period, Shipper shall pay DTE Gathering, as liquidated damages, an amount equal to one hundred ten percent (110%) of the currently effective Gas Cost Recovery Factor (pursuant to DTE Gas's Rate Book, or its successor, on file with the Michigan Public Service Commission) for any remaining deficient quantities.

D. If upon termination of this Agreement, Shipper has delivered to DTE Gathering at the Point(s) of Receipt, quantities of gas that are in excess of those that Shipper has taken at the Point(s) of Delivery, plus those quantities retained by DTE Gathering as compensation for Gas-in-Kind, the term of this Agreement will be extended, for a period of up to sixty (60) days, during which time Shipper shall receive the excess quantities from DTE Gathering pursuant to this Agreement at a mutually agreeable daily rate of receipt. Should DTE Gathering fail to correct this imbalance within the sixty (60) day period, DTE Gathering shall pay Shipper, as liquidated damages, an amount equal to 110% of the currently effective Gas Cost Recovery Factor (pursuant to DTE Gas's Rate Book or its successor on file with the Michigan Public Service Commission) for any remaining deficient quantities.

V. <u>MEASUREMENT AND MEASUREMENT EQUIPMENT</u>

A. Measurement

i. The unit of volume for the purpose of measurement shall be one Mcf.

ii. The average atmospheric (barometric) pressure at each Receipt Point and each Delivery Point shall be assumed to be fourteen and four-tenths (14.4) pounds per square inch, irrespective of the actual location or elevation above sea level of the Receipt Point or Delivery Point or of any variation in actual atmospheric pressure from time to time.

iii. The flowing temperature of the gas(es) shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 3.

iv. The static pressure of the gas(es)at the tap for each Receipt Point or Delivery Point shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 3.

v. The orifice differential pressure of the Gas shall be determined by means of an instrument of standard manufacture accepted in the industry for this purpose and installed in a manner consistent with the American Gas Association Report 3.

vi. The supercompressibility factor used in computing the volume of Gas delivered through a meter shall be determined in a manner consistent with the method contained in the American Gas Association "Manual for the Determination of Supercompressibility Factors for Natural Gas (AGA Report No. 8, Detail Method)" as such publication may be revised from time to time.

vii. The gas analysis, specific gravity, heating value, and mole percentage of the components of the gas used in computing the volume of gas delivered shall be determined at intervals of at least thirty (30) days and not to exceed forty five (45) days by means of an instrument(s) of standard manufacture accepted in the industry for this purpose using a sample of gas, or a representative sample of gas, of the gas stream flowing to the Receipt Point(s) or Delivery Point(s). If a valid sample cannot be obtained and processed without issue, then the last valid sample will be used until such a time as a valid sample can be successfully obtained and processed. Installation of and continual use of a gas chromatograph at any Receipt

Point(s) or Delivery Point(s) may be substituted for the other gas analysis provisions under this Section.

B. Measurement Equipment

i. The volume of gas delivered at each Receipt Point or Delivery Point shall be measured by utilizing one of the following,

(a) An orifice meter designed, installed, maintained and operated as recommended in the latest issue of American National Standard ANSI/API 2530 (American Gas Association Gas Measurement Report No. 3), entitled "Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids", as such publication may be revised from time to time (hereinafter referred to as "AGA Report No. 3") (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper); or

(b) A turbine meter designed, installed, maintained and operated as recommended in the latest issue of American Gas Association Transmission Measurement Committee Report No. 7 entitled "Measurement of Fuel Gas by Turbine Meters", as such publication may be revised from time to time (hereinafter referred to as "AGA Report No. 7" (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper); or

(c) An ultrasonic meter designed, installed, maintained and operated as recommended in the latest issue of the American Gas Association Gas

Measurement Report No. 9, entitled "Measurement of Gas by Multipath Ultrasonic Meters", as such publication may be revised from time to time (hereinafter referred to as "AGA Report No. 9") (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper); or

(d) A positive displacement meter installed and operated in accordance with generally accepted industry practices (any upgrade of equipment related to revised standards will be incorporated within a reasonable time period at the expense of Shipper).

The construction and installation of the metering facilities shall be in accordance with the recommendations and specifications set forth by the reports specified in Sections i(a), i(b), and i(c) hereof or by the meter manufacturer specified in Section i(d) hereof.

ii. Any auxiliary measuring equipment, if utilized, shall be installed, maintained and operated in accordance with generally accepted industry practices. Chromatographs calculating the heating value (Btu) of the gas shall be programmed having the Gas Processors Associated (GPA) Standard 2145 Table of Paraffin Hydrocarbons and Other Components of Natural Gas.

iii. The volume of gas delivered at each Receipt Point or Delivery Point shall be calculated by means of an electronic flow computer located at each Receipt Point or Delivery Point. The calculation shall be performed in the following manner:

(a) When the measuring equipment is an orifice meter, the flow of gas through the meter shall be computed in the manner recommended in AGA Report No. 3, properly using all factors set forth therein.

(b) When the measuring equipment is a turbine meter, the volume of gas delivered through the meter shall be computed in the manner recommended in AGA Report No. 7, properly using all facts set forth therein.

(c) When the measuring equipment is an ultrasonic meter, the volume of gas delivered through the meter shall be computed in the manner recommended in AGA Report No.9, properly using all facts set forth therein.

(d) When the measuring equipment is a positive displacement meter, the volume of gas delivered through the meter shall be computed by properly applying, to the volume delivered at flowing gas pressures and temperatures, correction factors as specified in the AGA Gas Measurement Manual Part Two, Displacement Measurement.

iv. The operator, for purposes of this Section, shall be DTE Parties. All flow, measuring, testing and related equipment shall be of standard manufacture and type approved by DTE Parties. Shipper may install check measuring equipment, provided that such equipment shall be installed so as not to interfere with the operations of DTE Parties. Shipper, in the presence of DTE Parties shall have access to measuring equipment at all reasonable times, but the reading, calibrating and adjusting thereof shall be done by DTE Parties. Shipper shall have the right to be present at the time of the installing, reading, cleaning, changing, repairing, inspecting, testing, calibrating or adjusting done by DTE Parties. The records from such measuring equipment shall remain the property of DTE Parties, but upon request, Shipper may request copies of the records, if any, together with calculations therefrom for inspection, subject to return within ten (10) working days after receipt thereof or longer if extended by mutual agreement. Reasonable care shall be exercised in the installation, maintenance and operation of the measuring equipment to avoid any inaccuracy in the determination of the volume of gas received and delivered. The components of the electronic measurement system shall be calibrated once every ninety (90) days but not to exceed one hundred twenty (120) days pursuant to Section viii below. If DTE Parties fails to perform the verification and testing, then Shipper shall have the right to cease or temporarily discontinue Gas Transportation Service under this Agreement relative to such measuring equipment. If either Party at any time desires a special test of any measuring equipment, it will promptly notify the other Party and the Parties shall then cooperate to secure a prompt verification of the accuracy of the equipment. The expense of any special test shall be borne by the Party requesting it if the measuring equipment is found to be in error by not more than two percent (2%) error in the aggregate. If, upon any test, any measuring equipment is found to be in error, such errors shall be taken into account in a practical manner in computing the deliveries. If the resultant aggregate error in the computed receipts or deliveries is not more than two percent (2%) error in the aggregate as measured during a calibration, then previous receipts or deliveries shall be considered accurate. All equipment shall, in any case, be adjusted at the time of testing to record correctly. If, however, the resultant aggregate error in computing receipts or deliveries exceeds two percent (2 %) error in the aggregate as measured during a calibration, then the previous recordings of such equipment shall be corrected to zero error for any period that is known definitely or agreed upon, but in case the period is not known definitely, or agreed upon, the correction shall be for the period extending over one-half of the time elapsed since the date of the last test.

v. In the event any measuring equipment is out of service, previous recordings of receipts or deliveries through such equipment shall be corrected using the following procedures:

(a) by using the registration of any check meter or meters, if installed and accurately registering, or in the absence of (a);

(b) by correcting the error if the percentage of error is ascertainable by calibration, special test or mathematical calculation, or in the absence of both (a) and (b) then;

(c) by estimating the quantity of receipt or delivery based on receipts or deliveries during preceding periods under similar conditions when the meter was registering accurately.

The correction period shall not exceed twelve (12) Months from the most recent test.

vi. If at any time during the term of service a new method or technique is developed with respect to gas measurement or the determination of the factors used in gas measurement, the new method or technique may be substituted upon DTE Parties' sole discretion, provided such measuring methodology is adopted by or acceptable to the natural gas transportation industry.

vii. The Parties agree to preserve for a period of at least two (2) years or such longer period as may be required by the applicable, valid requirements of any governmental bodies having or asserting jurisdiction, all test data, and other similar records.

viii. Electronic Gas Measurement (EGM) Technical Requirements

(a) Accuracy: The meter system should use instruments that will provide an overall measurement accuracy of + or - 0.5% of flow, taking into account all the sources of error, including calibrated span of instruments, linearity, hysteresis, repeatability, ambient temperature, stability, vibration, and power supply fluctuation. Generally, this accuracy can be achieved only by the use of high accuracy smart transmitters with a published accuracy of $\pm$ 0.1%.

Differential Pressure Transmitters shall be of a type that self compensate for static pressure effect or manufacturer's published compensation factor shall be programmed into the flow computer ("RTU").

All instruments should operate on a temperature range of negative 30 degrees Fahrenheit to positive 120 degrees Fahrenheit. The unit must be able to withstand mechanical shock of at least 1 G and Shipper will to be held responsible for any accidental damage to the equipment as a result of mechanical shock of over 1 G.

All equipment shall be installed per the specifications identified in AGA-3, AGA-7, and AGA-8 documents.

(b) Computation: The flow computer of the meter system shall as a minimum perform flow calculation per AGA-3, AGA-7, AGA-8, and AGA-9 requirements. As the aforementioned calculation methods are revised from time to time, new releases shall be implemented within twelve Months from the release data. Any costs related to the implementation of such upgrades shall be recovered from the Shipper. All other methods of computation must be approved by both Shipper and DTE Parties. All measured variables for differential pressure, static pressure, and temperature shall be sampled at least once per second. All volume calculations shall be made at least once per second.

(c) Data Security: The RTU must have password protection before data can be accessed or any parameters can be changed.

(d) Safety: The EGM system must meet standards for Class I, Division 2, Group D installations.

(e) Power: The RTU and the related hardware should run on re-chargeable batteries. These batteries can be charged by 20 VAC, 24 VDC or solar panels. For previously installed equipment, the battery capacity shall not be less than eight (8) hours. For future EGM installation, the battery capacity shall be at least twenty-four (24) hours when fully charged.

(f) Local Display: Shipper shall be provided with capability to monitor volume information being recorded by measurement system on an ongoing basis with either RTU display or transmitters with local display.

(g) All test and calibration equipment shall be certified to 0.1% accuracy and traceable back to an NIST primary standard. All test and calibration equipment shall be re-certified at least annually. In addition, DTE Parties shall perform such inspections and test of the accuracy of the equipment used in the EGM system calibrations. A copy of any inspection test of certification report for the meter that measures Shipper's Gas, whether performed by DTE Parties or a third party, shall be made available to Shipper personnel upon written request. After reasonable notice and request, DTE Parties shall provide Shipper with documentation on the tests and inspection and the annual certification planned for the equipment used to calibrate the EGM equipment. Calibration equipment must satisfy all applicable safety codes for the location in which it is being used, or the area must be checked and confirmed as gas free (less than 5 % LEL) prior to and during use.

A full loop (end device through RTU) test/calibration is required on all ANALOG inputs. Any adjustments to or calibration of the equipment shall be documented and kept as part of the audit trail. Provisions shall be made for Shipper to tap into meter run with an electronic transmitter for periodic calibration comparison, provided, however, any such tap shall be done with permission from DTE Parties and shall not interfere with DTE Parties' measurement operations at that point. The flow computer and/or RTU shall freeze the analog transmitter values during transmitter calibration and orifice plate removal and use the frozen values for the flow computation during calibration and orifice plate removal and re-installation.

(h) Audit: The following information must be kept for a minimum of two (2) years following the calendar year of production, or such longer period as may be required by the applicable, valid requirements of any governmental bodies having or asserting jurisdiction:

(1) All calculated volumes, energies, and daily averages must be maintained in their original unaltered form.

(2) Any changes to the data to correct for inaccuracies must be fully documented, including assumptions and factors used in calculating the adjustment.

All audit information will be available to Shipper personnel during normal business hours, upon reasonable notice and request.

ix. If, after two consecutive months of operations, the meter is operating at less than ten percent (10%) of the design capacity, DTE Parties may require that the flow be shut in or the meter station be redesigned to accurately measure the quantity of gas at the Shipper's expense.

x. If, after two consecutive months of operations, the meter is operating at greater than ninety percent (90%) of the design capacity, DTE Parties may require that the flow be shut in or the meter station be redesigned to accurately measure the quantity of gas at the Shipper's expense.

## VI. GAS QUALITY SPECIFICATIONS

Unless prior approval is obtained from DTE Parties, all Gas received and delivered under the terms of this Agreement must conform to the following specifications:

(a) The Gas must be commercially free from dust, gum, gum-forming constituents, and all other solid and liquid matters which may interfere with its merchantability or cause injury to or interfere with proper operation of the pipelines, regulators, meters or other appliances through which it flows;

(b) The Gas may not contain anything which might adversely affect the safe and efficient operation of DTE Parties' downstream facilities;

(c) The water content of the Gas may not exceed 5 pounds per million cubic feet;

(d) The Gas may contain oxygen according to the requirements of Section VIII, Oxygen Content, below;

(e) At any Receipt Point, the carbon dioxide content of the Gas may not exceed two mole percent (2%), unless Shipper can demonstrate that it has downstream treating agreements satisfactory to DTE Parties which provide that the carbon dioxide content of the gas will not exceed two mole percent (2%) at the outlet of the treating plant, in which case the carbon dioxide content may not be excessive in DTE Parties' sole opinion;

(f) The Gas may not contain more than 1/4 grain of hydrogen sulfide per 100 cubic feet;

(g) The Gas may not contain more than 1/2 grain of mercaptan sulfur per 100 cubic feet;

(h) The Gas may not contain more than 5 grains of total sulfur per 100 cubic feet, including the sulfur in any hydrogen sulfide, mercaptan, sulfides and residual sulfur;

(i) The Gas redelivered at each Delivery Point must have a total heating value per cubic foot of not less than 950 BTu at a base pressure of 14.65 pounds per square inch at 60 degrees Fahrenheit on a dry basis. If the Gas has been included in a downstream Gas treating agreement, the Gas at each Receipt Point must have a reasonable total heating value per cubic foot in DTE Parties' sole opinion;

(j) In the event the Gas delivered by Shipper at the Receipt Point(s) fails at any time to meet these quality specifications, DTE Parties shall notify Shipper of such deficiency and thereupon may, at its option, refuse to accept deliveries pending correction. Upon demonstration acceptable to DTE Parties that the Gas being tendered for delivery meets these quality specifications or that Shipper has arranged for the necessary treatment, processing or other action required for the Gas to meet these quality specifications, DTE Parties shall commence or resume, as the case may be, taking delivery of Gas;

(k) Shipper agrees to indemnify and hold DTE Parties harmless for any and all liability resulting from DTE Parties' movement of Gas received by Shipper which fails to meet the specifications hereunder and which have not been waived in writing by DTE Parties, including contamination or damage to other Gas being transported.

VII. DIVERSION OF GAS

The AEP is a stand-alone system for the $CO_2$ treating and transportation of Gas. The AEP has no direct end user or distribution markets, but interconnects with (i) DTE Gas, (ii) ANR Pipeline Company, (iii) Great Lakes Gas Transmission and (iv) Consumers Power Company ("Four Pipelines"), that do have direct markets. The Parties recognize that the AEP is thus not subject to diversion of gas. However, when AEP gas is delivered into each of the Four Pipelines, then such gas is subject to the diversion rules that apply to each such pipeline.

VIII. OXYGEN CONTENT

Shipper agrees that its Gas shall not exceed the acceptable concentration for oxygen in the gas stream as specified in the operating procedures set forth in Exhibit D ("Antrim Oxygen Procedures") attached hereto.

# Exhibit D

## ANTRIM OXYGEN PROCEDURES

I. MIX MASTER AND PIPELINE ANALYZERS.

A. Oxygen content at the DCP South Chester Antrim plants will be determined by an oxygen analyzer on the discharge of a new physical header ("Mix Master Analyzer"). The Mix Master Analyzer shall measure the oxygen content of the aggregate of Gas transported on the North Chester, South Chester, Little Bear, and Spartan pipelines ("Pipeline(s)"). The Mix Master Analyzer and the individual analyzers ("Pipeline Analyzers") will be maintained by DTE Parties.

B. The Mix Master Analyzer and the Pipeline Analyzers shall be calibrated and maintained according to the manufacturer's guidelines, except that the calibration gas used for calibration shall be no greater than nominal ten (10) parts per million ("PPM"). Shipper and all other shippers of Gas on the Pipelines shall have the right to designate a single representative, for the entire group, to witness all subsequent calibrations of the Mix Master Analyzer and each Pipeline Analyzer.

C. Shippers shall maintain the oxygen content of the Gas as determined by the Mix Master Analyzer at 3 PPM or less.

II. CPF ANALYZER.

A. Shipper shall install or cause to be installed an oxygen analyzer at each of its central processing facilities ("CPFs") or grouping of CPFs ("CPF Analyzer"). The CPF Analyzer shall be located upstream of the Receipt Point and Pipelines and shall measure the oxygen content of Gas representative of Gas being delivered into the Pipelines.

B. The CPF Analyzers shall be calibrated and maintained according to the manufacturer's guidelines, except that the calibration gas used for calibration shall be no greater than nominal ten (10) PPM. DCP and/or DTE Parties shall have the right to designate a single representative to witness all subsequent calibrations of each CPF Analyzer.

C. Each CPF Analyzer shall be equipped with a continuous recording device for the oxygen content. At Shipper's election, a CPF need not be equipped with continuous oxygen recording devices if the CPF is tied to a CPF kill/divert device set at 3 PPM oxygen, which will automatically prohibit any Gas from entering a Pipeline if the Gas contains oxygen above 3 PPM for a period of two (2) hours. DCP and/or DTE Parties shall have the right to designate a single representative to witness the calibration and operation of the kill/divert device.

D. Shipper shall maintain records of CPF Analyzer oxygen content readings, or records of the occurrence of automatic kill/divert incidents, for a period of not less than two (2) years. Shipper shall make the information available to either DTE Parties or DCP within twelve (12) business hours of a telephoned, e-mailed or faxed request for such information.

E. Shipper may at any time during normal business hours, request a DCP and/or DTE Parties representative to enter the Shipper's facilities to view the CPF Analyzer and its output. The DCP and/or DTE Parties representatives shall be accompanied by a Shipper representative at all times they are at Shipper's facilities.

III. <u>MIX MASTER GREATER THAN 3 PPM AND LESS THAN 7 PPM.</u>

If the oxygen content of the aggregate Gas stream, determined by the Mix Master

Analyzer, exceeds three (3) PPM, but is less than seven (7) PPM, DCP shall notify all shippers of Gas that have provided e-mail addresses, on any of the Pipelines via e-mail that the oxygen content must be at or below 3 PPM within 24 hours ("Notice"). The oxygen content at the Mix Master Analyzer must continuously register at or below three (3) PPM within and until 24 hours after sending the Notice. If the oxygen content of the aggregate Gas stream determined by the Mix Master Analyzer does not continually register at or below three (3) PPM within and until the 24 hour period, all shippers found to be flowing Gas at a receipt point in excess of 3 PPM shall be shut in, at that Receipt Point only, until Shipper and each other shipper at such receipt point establish to the reasonable satisfaction of DCP and/or DTE Parties that they can flow Gas at 3 PPM or less.

i. If Shipper can reasonably demonstrate to either DTE Parties or DCP personnel that the oxygen reading above 3 PPM at the receipt point and/or on its CPF Analyzer was a temporary condition, the production upstream of Shipper's Receipt Point will not be shut in.

ii. If Shipper was not flowing Gas at the point in time when the Mix Master Analyzer registered over 3 PPM, and, when Shipper's Receipt Point returns to production, the CPF Analyzer oxygen level exceeds 3 PPM, then Shipper will be allowed to flow Gas, provided the CPF Analyzer oxygen content falls below 3 PPM within one (1) hour after the commencement of Gas flow. If the oxygen level at the CPF Analyzer does not fall below 3 PPM within the one-hour period, Shipper shall immediately shut in all production upstream of that particular CPF Analyzer. If Shipper fails to shut in all production upstream of the CPF Analyzer, Shipper shall be shut in by DTE Parties and/or DCP. DTE Parties must be notified prior to any subsequent attempts by Shipper to deliver Gas into a Pipeline. Within twelve (12) business hours after returning to flowing Gas, Shipper shall provide CPF Analyzer data to DCP or DTE Parties to demonstrate that the oxygen content at the CPF Analyzer was reduced to below 3 PPM within one (1) hour of returning to production.

IV. <u>INSTALLATION OF KILL/DIVERT.</u>

If Shipper has had a CPF and/or Receipt Point that has been shut three (3) or more times in any 90-day rolling period, then Shipper shall tie its CPF Analyzer to a CPF kill/divert device so that any time the oxygen content of the Gas recorded at the CPF Analyzer exceeds 3 PPM for a period of two (2) hours, the Gas production monitored at the CPF Analyzer will be prevented from entering a Pipeline. Upon written request, Shipper shall be allowed by DCP and/or DTE Parties to remove the CPF kill/divert device from the CPF Analyzer if Shipper can demonstrate that for six (6) months, Shipper was continuously flowing Gas, subject to the two (2) hour period specified above, that contained 3 PPM or less of oxygen at the CPF Analyzer.

V. <u>MIX MASTER GREATER THAN 7 PPM</u>.

If the oxygen content determined by the Mix Master Analyzer exceeds seven (7) PPM, then DCP will observe the oxygen content of the Mix Master Analyzer for a period of thirty (30) minutes. If, at or before the date and time the Mix Master Analyzer registered more than 7 PPM oxygen, DCP had received notice from any shipper on any of the Pipelines, that a temporary condition had occurred, which resulted in oxygen greater than 3 PPM entering a Pipeline, then the observation period shall be one (1) hour. If at the end of the observation period, the Mix Master Analyzer reading remains at seven (7) PPM or above, then DCP will take the following actions in the following order:

i. The oxygen content recorded by each of the Pipeline Analyzers will be observed.

ii. Any Pipeline with an oxygen level of ten (10) PPM or greater will have its flow immediately curtailed.

ii. All shippers on the Pipeline, will be notified via e-mail by DCP and/or DTE Parties of the flow curtailment on a particular Pipeline.

iii. The Pipelines having the highest level of oxygen determined by the Pipeline Analyzer shall be curtailed first, provided, however, no Pipeline with less than three (3) PPM oxygen will be curtailed.

iv. DCP shall have the right to establish or continue flow curtailment in any Pipeline containing more than three (3) PPM oxygen until such time as the total Gas stream at the Mix Master Analyzer has been reduced to continuously record three (3) PPM or less.

VI. <u>PIPELINE ANALYZER GREATER THAN 10 PPM.</u>

Each of the four Pipelines must, individually, at all times, contain less than ten (10) PPM of oxygen. If a Pipeline Analyzer is registering greater than 10 PPM and the Mix Master Analyzer is registering greater than 3 PPM, DCP shall have the right to immediately curtail flow on the offending pipeline. If oxygen greater than 10 PPM is registered on a Pipeline Analyzer, but the oxygen content determined by the Mix

Master Analyzer remains below 3 PPM, then the oxygen level of Gas in a Pipeline must be reduced to continually record below 10 PPM, within and until 24 hours after a concentration of oxygen greater than 10 PPM was detected. All shippers on the Pipeline will be notified by DCP and/or DTE Parties of the excess oxygen via e-mail. If the oxygen level in the Pipeline does not continuously register below 10 PPM within and until 24 hours after the notice, then the following actions will be taken, in the following order, on a Pipeline-by-Pipeline basis:

i. The flow of Gas in the Pipeline shall be continuously monitored and curtailed and adjusted from time to time as need be, so that the oxygen content of the aggregate Gas stream as determined at the Mix Master Analyzer never exceeds three (3) PPM.

ii. If Shipper is found to be flowing Gas at a CPF Analyzer or at a Receipt Point in excess of 3 PPM oxygen, the Receipt Point shall be shut in until all shippers at such receipt point establish to the reasonable satisfaction of DCP or DTE Parties that they can flow Gas at 3 PPM or less.

iii. The flow of Gas in the Pipeline shall remain curtailed to the extent necessary until such time as the actions outlined in this Exhibit result in the Pipeline returning to a status of continuously containing less than 10 PPM of oxygen.

Sep 18, 2018, 10:19am EDT

# Technology And Efficiency Gains Create A 'New Normal' For U.S. Shale

**David Blackmon** Senior Contributor
Energy

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- It is these kinds of gains that advocates of the goofy, always-wrong "Peak Oil" theories never take into account
- Absent some global, demand-killing economic calamity, we can expect U.S. oil and natural gas production to continue to increase for many years to come

A Colgate Energy LLC oil drilling rig stands in Reeves County, Texas, U.S., on Thursday, Aug. 23, ... [+]

The hits just keep on coming from the U.S. Energy Information Administration (EIA). As the accelerating pace of technological advancement in the domestic oil and gas industry results in steadily-growing per well recoveries and efficiency gains, the numbers documenting the results take on an almost incomprehensible air.

Consider some of the headlines we've seen in the U.S. energy news media in just the past 10 days:

- North Dakota is Producing as Much Oil as the Entire Country of Venezuela (*The Daily Caller*, 9/17/2018)
- Haynesville Shale Gas Production is Bouncing Back (*Oilprice.com*, 9/12/2-18)
- U.S. shale oil production to rise to 7.6 million barrels per day in October (*Reuters*, 9/18/2018)
- U.S. overtakes Russia, Saudi Arabia as world's largest crude producer (*World Oil*, 9/12/2018)

These are amazing data points, and don't include many others that could be noted, such as the fact that Texas's oil production in June of this year (3.15 million bopd) surpassed that of every OPEC nation other than Saudi Arabia and Iraq. One of the most impressive facets of the rapid rise in U.S. production since 2016 is that it has been achieved with an active rig count that is about 40% lower than it was just a half-decade ago. This reality demonstrates how important technological advancement and efficiency gains are to the oil and gas industry.

The Haynesville Shale data point is particularly instructive in this regard. According to the DrillingInfo Daily Rig Count, the number of drilling rigs active in the Haynesville region has remained essentially unchanged over the past year. Yet, the EIA data shows Haynesville gas production ramping up from 4.2 bcf per day to about 6.5 bcf per day over that period time, an amazing 50% increase in just a year. That is truly stunning for a play area that was almost dormant for three years beginning in mid-2013.

So why is this happening? The answers come down to two key factors:

- Impressive gains in efficiency have significantly reduced the time it takes to drill, frac and complete each well. Some producers I've talked to report that wells that used to take 25-30 days to drill and complete now take only 10-12 days to get done. Thus, each active rig is able to drill more wells than was formerly possible;

- Rapid advancements in drilling, fracking and completion technologies are resulting in impressive per-well productivity gains. These advancements include things such as more powerful rigs able to drill longer horizontal laterals; more sophisticated drill stem and surface technologies that allow drillers to more accurately target the formation's sweet spots during the drilling process; advancements in fracking fluids that result in more formation rock being fractured, thus freeing up more gas and liquids to flow into the pipes, and many others.

The net result is that operators are able to drill more wells in shorter time and recover more natural gas and petroleum liquids from each well. Efficiency gains in the completion process also enable the operators to get each well online and producing quicker than was formerly possible. That's how you get to a 50% gain year-over-year in basin productivity without increasing the rig count.

These gains are not isolated to the Haynesville region - they're taking place all over the country. This is why it was possible for the Bureau of Land Management to conduct that billion dollar lease sale in New Mexico's piece of the Permian Basin a few weeks ago, a sale that netted an average per-acre bonus payment of an unprecedented $95,000. Two years ago, before all the recent gains in efficiency and technologies, a similar lease sale would have no doubt fetched a fraction of that.

It is these kinds of gains that advocates of the goofy, always-wrong "Peak Oil" theories never take into account . They invariable assume that the oil and gas industry just a static, low-technology beast that is based on nothing but brute force and luck. The reality, of course, is that it is one of the most high-tech industries on the face of the earth, led by engineers, geologists and other scientists who advance efficiencies and improve technologies each and every day.

While various prophets of doom predict "peak oil" or some inevitable decline in the industry to begin taking place in just the next few years, the reality is that this industry is just in the infancy of its shale revolution. The gains in efficiencies and technology are not nearing an end - they are in fact just getting started. Absent some global, demand-killing economic calamity, we can expect U.S. oil and natural gas production to continue to increase for many years to come .

That isn't idle speculation - as recent headlines and EIA data clearly show, this is the "new normal" for the domestic oil and gas industry.

*Follow me on Twitter.*

**David Blackmon**

David Blackmon is an independent energy analyst/consultant based in Mansfield, TX. David has enjoyed a 39-year career in the oil and gas industry, the last 23 years of...

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| | Item | Apr-20 | May-20 | Jun-20 | Jul-20 | Aug-20 | Sep-20 | Oct-20 | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Pipeline Capacity (Dth/Day)** | | | | | | | | | | | | | |
| 2 | 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 | |
| 3 | Viking/ANR Northern | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | |
| 4 | Vector | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | |
| 5 | Panhandle Field Zone | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | |
| 6 | NEXUS - Kensington | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | |
| 7 | NEXUS - Clarington | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | 37,500 | |
| 8 | 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 | |
| 9 | ANR SW | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | 79,000 | |
| 10 | ANR ML3 | - | - | - | - | - | - | - | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | |
| 11 | Total | 330,390 | 330,390 | 330,390 | 330,390 | 330,390 | 330,390 | 330,390 | 400,390 | 400,390 | 400,390 | 400,390 | 400,390 | |
| 12 | **Supply Delivered (Dth/Day)** | | | | | | | | | | | | | |
| 13 | Great Lakes | 30,383 | 30,377 | 28,247 | 30,331 | 27,672 | 28,174 | 28,315 | 30,367 | 30,361 | 30,314 | 30,343 | 30,314 | |
| 14 | Viking/ANR Northern | 20,941 | 20,941 | 18,785 | 20,946 | 20,872 | 20,872 | 18,315 | 20,899 | 20,899 | 20,860 | 20,860 | 17,667 | |
| 15 | Vector | 9,954 | - | - | - | - | - | - | - | - | - | - | 19,216 | |
| 16 | Panhandle Field Zone | 65,065 | 64,999 | 64,999 | 64,969 | 62,842 | 62,813 | 62,813 | 64,184 | 64,263 | 65,181 | 64,576 | 64,416 | |
| 17 | NEXUS - Kensington | - | 20,000 | 37,950 | 36,996 | 37,970 | 33,806 | 37,900 | - | 10,000 | 37,900 | 37,900 | 37,900 | |
| 18 | NEXUS - Clarington | 74,299 | 37,241 | 37,015 | 35,785 | 37,015 | 36,582 | 37,015 | 37,493 | 37,367 | 37,014 | 37,014 | 37,014 | |
| 19 | ANR Alliance | 43,653 | 37,540 | - | - | - | - | - | - | - | 2,486 | - | 49,919 | |
| 20 | ANR SW | 78,831 | 78,991 | 77,822 | 78,993 | 77,823 | 77,820 | 50,750 | 78,303 | 78,311 | 78,951 | 76,132 | 78,365 | |
| 21 | ANR ML3 | - | - | - | - | - | - | - | 9,379 | 9,379 | 59,913 | 14,726 | 59,913 | |
| 22 | Total | 292,742 | 259,712 | 236,571 | 237,688 | 236,521 | 231,893 | 206,793 | 210,257 | 220,218 | 302,305 | 251,207 | 364,409 | |
| 23 | **Capacity Released (Dth/Day)** | | | | | | | | | | | | | |
| 24 | Great Lakes | - | - | - | - | - | - | - | - | - | - | - | - | |
| 25 | Viking/ANR Northern | - | - | - | - | - | - | - | - | - | - | - | - | |
| 26 | Vector | - | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | - | - | - | 20,000 | - | - | |
| 27 | Panhandle Field Zone | - | - | - | - | 2,100 | - | 2,100 | - | - | - | - | - | |
| 28 | NEXUS - Kensington | - | 17,500 | - | - | - | - | - | 37,500 | 27,500 | - | - | - | |
| 29 | NEXUS - Clarington | - | - | - | - | - | - | - | - | - | - | - | - | |
| 30 | 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 | |
| 31 | ANR SW | - | - | - | - | - | - | - | - | - | - | - | - | |
| 32 | ANR ML3 | - | - | - | - | - | - | - | 50,000 | 50,000 | - | 45,200 | - | |
| 33 | Total | 50,000 | 77,500 | 60,000 | 60,000 | 62,100 | 60,000 | 52,100 | 137,500 | 127,500 | 70,000 | 95,200 | 50,000 | |
| 34 | **Total Utilization (Dth/Day)** | | | | | | | | | | | | | |
| 35 | Great Lakes | 30,383 | 30,377 | 28,247 | 30,331 | 27,672 | 28,174 | 28,315 | 30,367 | 30,361 | 30,314 | 30,343 | 30,314 | |
| 36 | Viking/ANR Northern | 20,941 | 20,941 | 18,785 | 20,946 | 20,872 | 20,872 | 18,315 | 20,899 | 20,899 | 20,860 | 20,860 | 17,667 | |
| 37 | Vector | 9,954 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | - | - | - | 20,000 | - | 19,216 | |
| 38 | Panhandle Field Zone | 65,065 | 64,999 | 64,999 | 64,969 | 64,942 | 62,813 | 64,913 | 64,184 | 64,263 | 65,181 | 64,576 | 64,416 | |
| 39 | NEXUS - Kensington | - | 37,500 | 37,950 | 36,996 | 37,970 | 33,806 | 37,900 | 32,500 | 37,500 | 37,900 | 37,900 | 37,900 | |
| 40 | NEXUS - Clarington | 74,299 | 37,241 | 37,015 | 35,785 | 37,015 | 36,582 | 37,015 | 37,493 | 37,367 | 37,014 | 37,014 | 37,014 | |
| 41 | ANR Alliance | 93,653 | 87,540 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 52,486 | 50,000 | 99,919 | |
| 42 | ANR SW | 78,831 | 78,991 | 77,822 | 78,993 | 77,823 | 77,820 | 50,750 | 78,303 | 78,311 | 78,951 | 76,132 | 78,365 | |
| 43 | ANR ML3 | - | - | - | - | - | - | - | 59,379 | 59,379 | 59,913 | 59,926 | 59,913 | |
| 44 | | 373,125 | 367,589 | 324,817 | 328,019 | 326,294 | 320,067 | 287,208 | 373,125 | 378,080 | 402,619 | 376,750 | 444,723 | |
| 45 | **Total Utilization Rate** | | | | | | | | | | | | | |
| 46 | Great Lakes | 100% | 100% | 93% | 100% | 91% | 93% | 93% | 100% | 100% | 100% | 100% | 100% | |
| 47 | Viking/ANR Northern | 100% | 100% | 89% | 100% | 99% | 99% | 87% | 100% | 100% | 99% | 99% | 84% | |
| 48 | Vector | 100% | 100% | 100% | 100% | 100% | 100% | 0% | 0% | 0% | 100% | 0% | 96% | |
| 49 | Panhandle Field Zone | 100% | 100% | 100% | 100% | 100% | 97% | 100% | 99% | 99% | 100% | 99% | 99% | |
| 50 | NEXUS - Kensington | 0% | 100% | 100% | 99% | 100% | 90% | 100% | 87% | 100% | 100% | 100% | 100% | |
| 51 | NEXUS - Clarington | 198% | 99% | 99% | 95% | 99% | 98% | 99% | 100% | 100% | 99% | 99% | 99% | |
| 52 | ANR Alliance | 187% | 175% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 105% | 100% | 200% | |
| 53 | ANR SW | 100% | 100% | 99% | 100% | 99% | 99% | 64% | 99% | 99% | 100% | 96% | 99% | |
| 54 | ANR ML3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 99% | 99% | 100% | 100% | 100% | |
| 55 | | 113% | 111% | 98% | 99% | 99% | 97% | 87% | 93% | 94% | 101% | 94% | 111% | |

**Notes:**
(1) ANR Alliance is segmented to allow DTE Gas Company to release 50,000 Dth/d capacity from Joliet to Crystal Falls.
(2) Other Pipelines below 100% due to unsubscribed capacity releases
(3) NEXUS - Clarington exceeded 100% in April 2020 due to incremental capacity purchased for one month.

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of | ) | |
| **DTE GAS COMPANY** for reconciliation of | ) | |
| its gas cost recovery plan (Case No. U-20543) | ) | Case No. U-20544 |
| for the 12 months ended March 31, 2021. | ) | |
| | ) | |

QUALIFICATIONS

AND

DIRECT TESTIMONY

OF

LUCIAN BRATU

**DTE GAS COMPANY**
**QUALIFICATIONS OF LUCIAN BRATU**

Line No.

**Q1. What is your name, business address and by whom are you employed?**

A1. My name is Lucian Bratu. My business address is: One Energy Plaza, Detroit, Michigan, 48226. I am employed by DTE Gas Company (DTE Gas or Company) as a Senior Gas Supply & Planning Analyst in Gas Supply and Planning.

**Q2. On whose behalf are you testifying?**

A2. I am testifying on behalf of DTE Gas.

**Q3. What is your educational background?**

A3. I earned a Bachelor of Electromechanical Engineering Degree from Polytechnic University of Bucharest and a Master's Degree in Business Administration from University of Windsor.

**Q4. What work experience do you have?**

A4. After an engineering career in the automotive industry, in 2009 I was hired full time by Union Gas Limited, one of the two major natural gas distribution companies in Ontario, Canada at that time where I held positions of increased responsibility in Finance, Operations and Business Development. I was hired by DTE Energy in August 2015 as a full time Senior Strategist in the Emergency Preparedness & Response department of DTE Electric Company (DTE Electric) where I implemented engineering solutions and process changes to reduce power outage duration and restoration costs. In August 2017, I accepted a position in the Vegetation Management department where I designed and implemented an herbicide treatment program to control the vegetation in the right-of-way more effectively and at a reduced cost. In July 2018, I accepted a position with DTE Gas as a Senior Gas Supply & Planning Analyst in the Gas Supply and Planning Department.

**Q5. Do you hold any certifications or are you a member of any professional organizations?**

A5. I earned a Professional Engineer certification from Professional Engineers Ontario (PEO), the licensing and regulation body for professional engineers in Ontario, Canada.

**Q6. Have you had other applicable training?**

A6. I have completed The Oxford Princeton Programme's "Overview of the North American Natural Gas Industry" and "North American Natural Gas Transportation and Storage" training.

**Q7. What are your current duties and responsibilities?**

A7. I am responsible for the planning of natural gas supplies necessary to reliably meet the requirements of DTE Gas's customers.

**Q8. Have you been involved in any prior regulatory proceedings?**

A8. Yes. I adopted witness Foster's testimony before the MPSC in case U-20076, DTE Gas 2017-18 GCR Reconciliation and I have sponsored testimony before the MPSC in the following cases:

- U-20210 DTE Gas 2018-19 GCR Reconciliation
- U-20235 DTE Gas 2019-20 Gas Cost Recovery (GCR) Plan
- U-20236 DTE Gas 2019-20 GCR Reconciliation

- U-20543 DTE Gas 2020-21 Gas Cost Recovery (GCR) Plan
- U-20816 DTE Gas 2021-22 Gas Cost Recovery (GCR) Plan

Line No.

**PURPOSE OF TESTIMONY**

**Q9. What is the purpose of your testimony?**

A9. I am providing testimony to present DTE Gas's actual operations for the April 1, 2020 through March 31, 2021 operational year (Reconciliation Period) and to compare them to the projected operations as filed in the 2020-21 GCR Plan, Case No. U-20543. I also describe the operational challenges during that period and the reasonable and prudent actions that the Company took while implementing its 2020-21 GCR Plan (Plan). In summary, my testimony addresses comparisons to the 2020-21 GCR Plan, which is summarized below:

1. **Overview**. As the 2020-21 GCR Plan year progressed, DTE Gas planned to adjust both GCR (Gas Cost Recovery) and GCC (Gas Customer Choice) monthly supply volumes in response to changes in actual sendout, actual storage balances achieved, and changes in forecasted requirements.

2. **Plan Year Overall.** DTE Gas expected to begin the 2020-21 GCR Plan year with 11.2 Bcf GCR/GCC Working Gas on April 1, 2020, with normal weather sendout of 162.7 Bcf, plus the addition of 162.7 Bcf of supply, which would result in an ending normal weather storage balance of 11.2 Bcf of GCR/GCC Working Gas on March 31, 2021.

3. **April through October Operations**.

   a. The Company planned to adjust summer GCR and GCC supply (April 2020 through October 2020) in its effort to fill storage to a targeted GCR/GCC storage balance of 70.1 Bcf of Working Gas by October 31, 2020, which includes 5 Bcf for CTN (colder-than-normal) protection.

   b. Normal weather GCR/GCC summer sendout was expected to be 43.7 Bcf, served by 102.6 Bcf of flowing supply with a 58.9 Bcf storage injections.

Line No.

4. **November through March Operations.** Normal weather GCR/GCC winter sendout was expected to be 118.9 Bcf, served by 60.0 Bcf of flowing supply and 58.9 Bcf of storage withdrawal.

5. **Winter 2020-21 Peak Day Operations.** DTE Gas planned to maintain adequate combined GCR/GCC storage balances throughout the winter months to meet or exceed the minimum storage balances required for design day sendout conditions.

6. **Gas Supply Physical Call Option.** DTE Gas purchased a Gas Supply Physical Call Option for up to 250,000 Dth/day or 237 MMcf/day for any 10 days in January and February to mitigate a reduction in storage deliverability following a potential failure of the dehydration unit at Belle River Mills storage field and ensure that sufficient supply is available to serve the GCR and GCC customers if such failure would occur.

**Q10. Are you sponsoring any exhibits in this proceeding?**

A10. Yes. I am sponsoring the following exhibits:

| Exhibit | Description |
|---|---|
| A-8 | Plan vs. Actual Monthly GCR Supply |
| A-9 | Summary of Operating Season and 12-Month Plan vs. Actual Source and Disposition |
| A-10 | Graphical Representation of Normal Heating Degree Days vs. Actual Daily Heating Degree Days for Metro Detroit |
| A-11 | Graphical Representation of Plan vs. Actual GCR and Gas Customer Choice (GCC) Month End Storage Balances |
| A-12 | Plan vs. Actual Monthly Source and Disposition |

| | |
|---|---|
| A-13 | Plan vs. Actual Peak Day Summary |
| A-27 | Deliverability Restoration Alternatives for Belle River Mills Dehydration Unit Failure |

**Q11. Were these exhibits prepared by you or under your direction?**

A11. Yes, they were.

**OVERVIEW**

**Q12. Were there any factors during the 2020-21 GCR Plan year that caused DTE Gas to adjust its operational plan?**

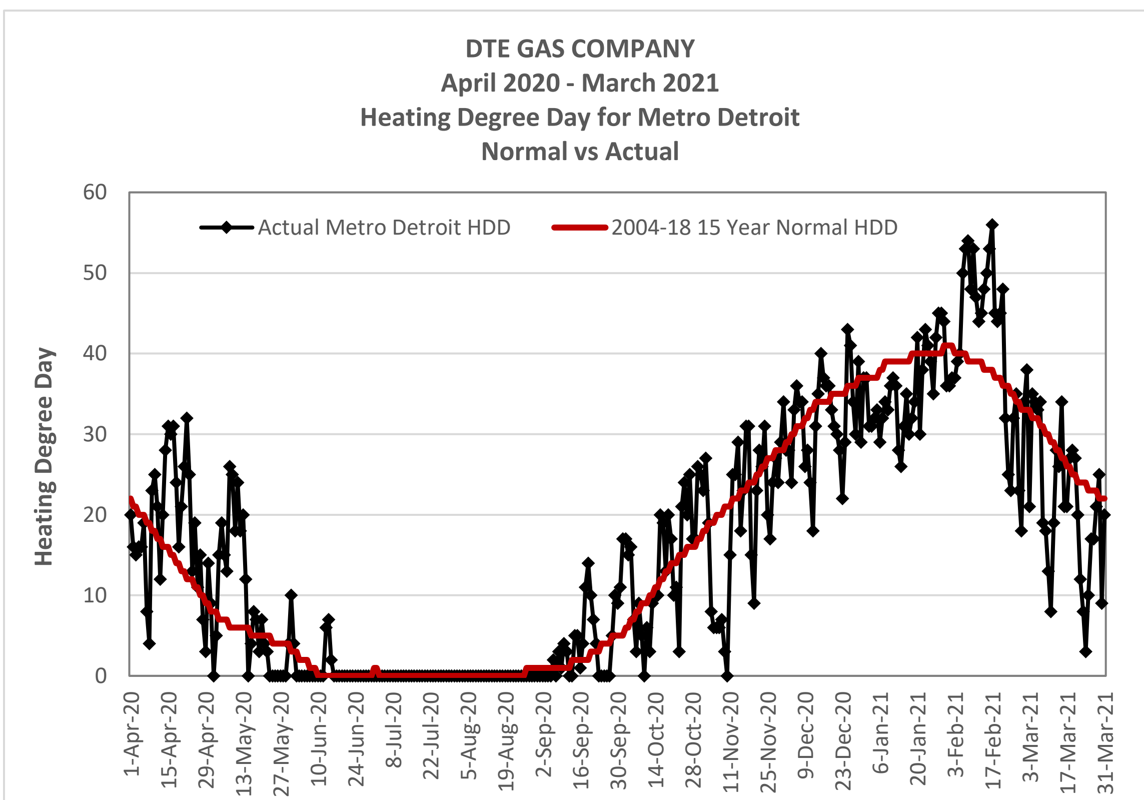
A12. Yes, multiple factors during the 2020-21 GCR Plan year caused DTE Gas to adjust its operational plan. Due to the warmer-than-normal 2019-20 winter, the 2020-21 Plan year began with 5.4 Bcf more gas in storage than projected. Decreased GCR/GCC sales volumes due to warmer-than-normal weather and the effect of the COVID-19 pandemic combined with lower company use and losses caused sendout to decrease below Plan by 3.6 Bcf for the 2020-21 Plan year. Combined, these factors contributed to approximately 9.0 Bcf in decreased requirements for the Plan year. DTE Gas responded to this decrease in requirements by decreasing GCR/GCC supply by 4.6 Bcf. This resulted in 4.3 Bcf more gas in storage than projected by the end of the Plan year. The remainder of my testimony will provide more detail for the summer and winter seasons separately, including explanation for any variation from GCR Plan.

Line
No.

**PLAN YEAR OVERALL**

**Q13. How did planned normal weather compare to actual weather experienced during the 2020-21 GCR Plan Year?**

A13. Weather for the operating year was 0.8% warmer than normal, or about 47 HDDs (Heating Degree Days) warmer than the 15-year normal (2004-2018), as illustrated in Exhibit A-9, line 36, column (i). Please refer to Exhibit A-10 for a graphical illustration of the actual daily weather experienced at the Detroit Metro National Weather Facility. This chart, also included in summary fashion below, illustrates the daily fluctuation in HDDs relative to the normal average daily HDDs for Detroit. DTE Gas was able to accommodate these weather variations by utilizing the Company's supply planning process described in the Plan case.



**Q14. How did Plan sendout compare to actual sendout for the 2020-21 GCR Year?**

A14. As identified in Exhibit A-9, line 6, columns (g) through (i), the total planned sendout was 162.7 Bcf versus an actual sendout of 159.1 Bcf, which was 3.6 Bcf lower than planned. The actual sendout was lower than Plan due to the following reasons: (a) 2.9 Bcf lower sales volumes due to warmer than normal weather and the COVID-19 pandemic, and (b) approximately 0.7 Bcf of lower than planned company use and losses.

**Q15. Why were company use and losses 0.7 Bcf lower than planned for the 2020-21 GCR year?**

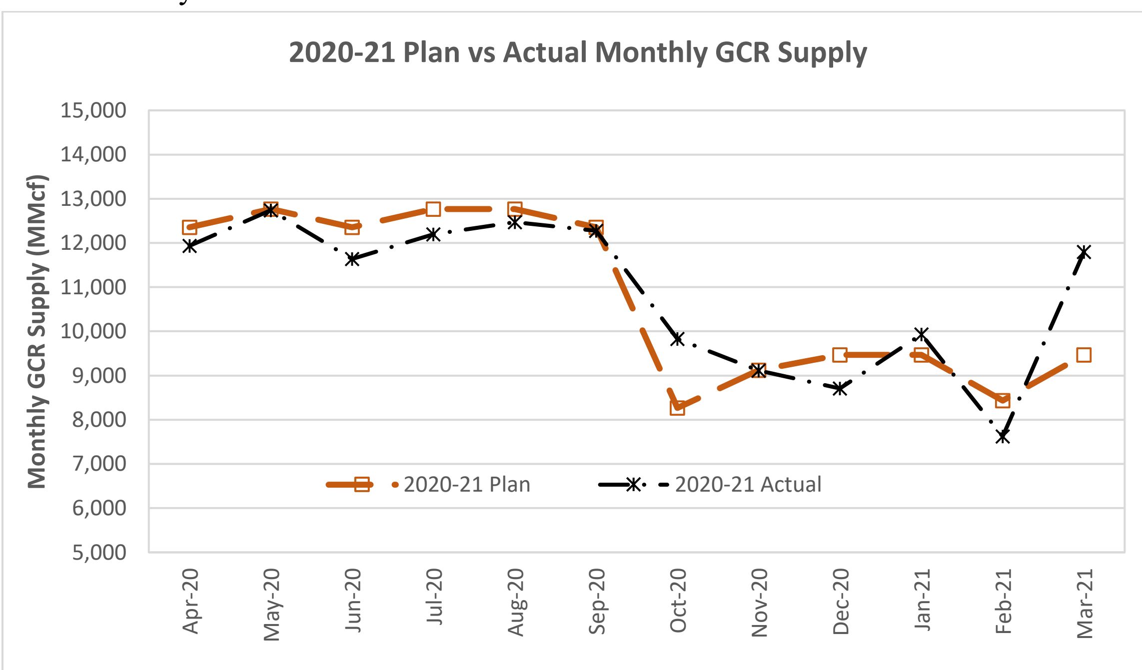
A15. Company use and losses were projected to be 9.3 Bcf for the 2020-21 Plan Year. However, actual company use and losses experienced during the Plan Year were 8.6 Bcf, or approximately 0.7 Bcf lower than planned. The 0.7 Bcf variance in company use and losses, found in Exhibit A-9, line 3, column (i), was the result of Company use volumes lower than expected by 0.9 Bcf offset by losses slightly higher than expected by 0.2 Bcf.

**Q16. What types of occurrences can result in actual Company use and losses volumes being different than planned?**

A16. Differences in forecasted Company use versus actual volumes could vary for several reasons, such as but not limited to fuel for compressors, gas processing at storage facilities and gas to heat Company facilities. Lost gas actual volumes could also vary for several reasons, such as but not limited to transmission losses, distribution system leaks, theft and metering errors.

**Q17. How did the GCR Plan total supply compare to the actual total supply for the 2020-21 GCR Year?**

A17. The actual GCR/GCC supply for the year was 158.0 Bcf, or approximately 4.6 Bcf lower than the Plan level of 162.7 Bcf, as illustrated in Exhibit A-9, line 14, columns (g) through (i). The actual supply was lower than planned primarily due to higher than planned storage inventory balance at the beginning of the gas year combined with lower than planned GCR/GCC market demand. A graphical representation of the monthly GCR supply is illustrated in Exhibit A-8. This exhibit illustrates actual GCR supply variations from the Plan on a monthly basis, and is also include in summary fashion below.




**Q18. Why do "Purchased Gas" volumes for the 2020-21 GCR year of 130.3 Bcf in Exhibit A-9, line 10, column (h) differ from “Purchased” volumes of 130.7 Bcf in Witness LoRe’s Exhibit A-15, page 1 of 2, line 1?**

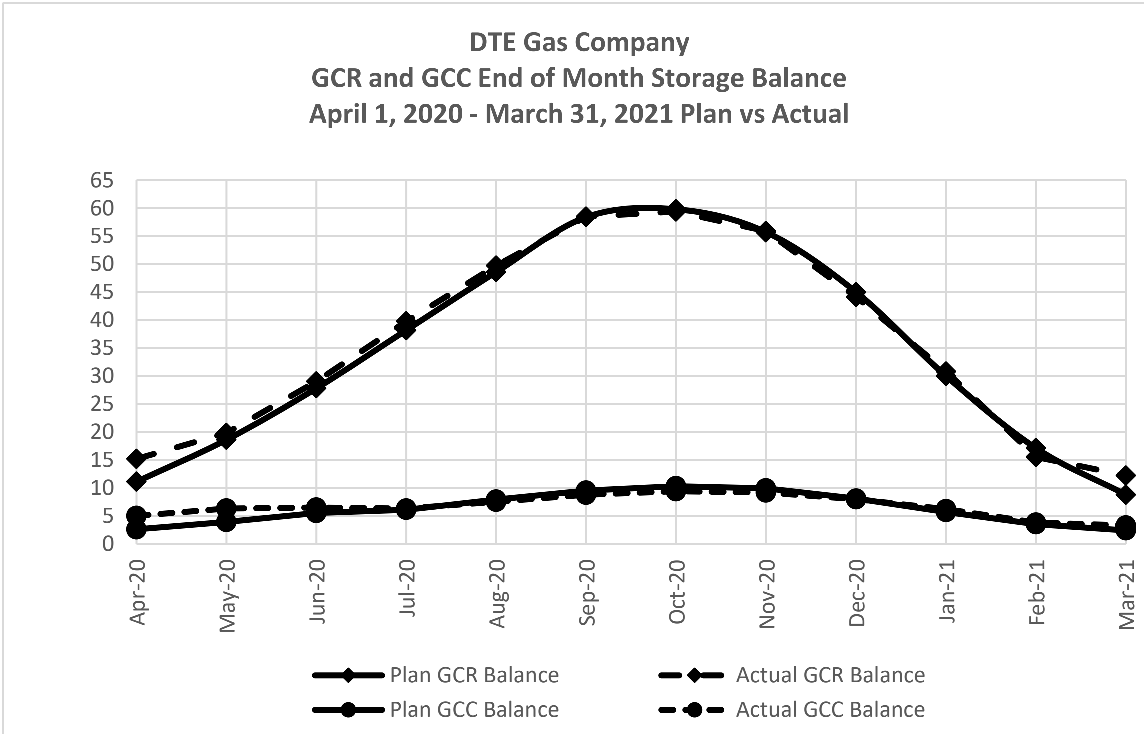
A18. This variance is due to the fact that Company Witness LoRe includes Exchange Gas of 0.4 Bcf in "Purchased" volumes, whereas these volumes are reported instead in "Exchange/Gas in Kind" on line 11 of Exhibit A-9.

**Q19. What volumes are included in "Exchange/Gas in Kind" on line 11, column (h) of Exhibit A-9?**

A19. This line item includes exchange gas activity of 0.4 Bcf for the 2020-21 Plan Year. Exchanges primarily include imbalances in physical deliveries at pipeline interconnects, which could either be positive (over delivery of gas into DTE Gas's system) or negative (under delivery of gas into DTE Gas's system). These imbalances are usually short term in nature and cleared in a matter of days to weeks. The other item included in Exhibit A-9, line 11, column (h) is Gas in Kind of 6.1 Bcf. Gas in Kind includes those volumes collected from system transportation customers for recovering system fuel costs. The total "Exchanges/Gas in Kind" for the 2020-21 Plan Year was approximately 6.6 Bcf as illustrated in Exhibit A-9, line 11, column (h)

**Q20. How did the Company's actual 2020-21 storage operations compare to the 2020-2021 GCR Plan projections?**

A20. DTE Gas began the April 2020 through March 2021 Plan Year with 5.4 Bcf more gas in storage than planned for GCR and GCC customers primarily due to warmer than normal weather experienced in March 2020. By October 31, 2020, the actual GCR/GCC storage balance was 68.7 Bcf, or 1.4 Bcf lower than the Plan level of 70.1 Bcf as illustrated in Exhibit A-9, line 32, columns (a) through (c) primarily due to colder-than-normal weather experienced in October 2020. This was followed by warmer-than-normal winter weather, which resulted in an ending GCR/GCC storage balance of 15.5 Bcf which was 4.3 Bcf higher than the 11.2 Bcf normal weather




storage balance. A graphical representation of the monthly storage balances for both GCR and GCC customers is illustrated in Exhibit A-11. This exhibit illustrates actual storage balance variations from the Plan on a monthly basis, and is also included in summary fashion below. Summer and winter operations are discussed separately in more detail below.

## APRIL THROUGH OCTOBER OPERATIONS

**Q21. How did GCR Plan weather compare to actual weather during the April through October 2020 summer period?**

A21. The actual summer season from April through October 2020 was 27.1% colder-than-normal (CTN) with 1,373 HDDs, or 293 HDDs colder than the Plan level of 1,080 HDDs.

Line No.

**Q22. How did GCR Plan sendout compare to actual sendout during the summer 2020 injection season?**

A22. Total planned sendout from April through October 2020 was 43.7 Bcf. Actual sendout for this time period was 46.8 Bcf, resulting in 3.1 Bcf higher sendout. This variance was due to: a) 2.7 Bcf higher GCR/GCC sales volumes and b) 0.4 Bcf higher company use and losses.

**Q23. How did DTE Gas's actual GCR supply purchases compare to GCR Plan levels for the injection cycle of 2020?**

A23. Planned GCR supply purchases for April through October 2020 were 83.6 Bcf. Actual GCR supply purchases for this period were 83.1 Bcf, which is approximately 0.5 Bcf lower than Plan due to: a) higher GCR sales volumes, which were 3.5 Bcf higher than planned, b) the 2020-21 Plan year that began with 3.3 Bcf more gas in GCR storage than projected, and c) other factors such as Exchanges, Gas In Kind and Company Use/Loses that collectively were 0.5 Bcf higher than planned. The supply variance is illustrated in Exhibit A-9, line 10, columns (a) through (c).

**Q24. How did the Company's actual summer 2020 storage operations compare to the 2020-2021 GCR Plan projections?**

A24. DTE Gas began the April 2020 through March 2021 Plan Year with 16.6 Bcf of gas in storage for GCR/GCC customers, which was 5.4 Bcf higher than the projected level of 11.2 Bcf due to warmer than normal weather. This variance is more fully described in the Company's 2019-20 GCR Reconciliation Case No. U-20236. By October 31, 2020, the actual GCR/GCC storage balance was 68.7 Bcf, or 1.4 Bcf lower than the Plan level of 70.1 Bcf.

**Q25. Why was the actual GCR storage balance lower by 1.4 Bcf than the GCR Plan storage target of 70.1 Bcf on October 31, 2020?**

A25. The actual GCR storage balance was lower by 1.4 Bcf than the GCR Plan storage target of 70.1 Bcf primarily due to higher than expected GCR market demand in October 2020, which was caused by colder-than-normal weather.

**Q26. Are there any amounts related to the GCC reconciliation included in your exhibits?**

A26. Yes, on line 13 of Exhibit A-12, page 2 of 4, actual GCC supply includes 4.5 Bcf of surplus GCC supply from the 2019-20 program year that was returned in June 2020 through September 2020. This is reflected as an offset to the GCC flowing supply deliveries for those months. The Plan had assumed approximately 1.3 Bcf of surplus deliveries to be returned to GCC suppliers in July 2020. Additionally, actual GCC sendout in July 2020 reflects a reduction of 0.1 Bcf with an equivalent increase to GCR sales volumes resulting from the annual GCC reconciliation pursuant to Tariff requirements.

**NOVEMBER THROUGH MARCH OPERATIONS**

**Q27. How did GCR Plan weather compare to actual weather during the November 2020 through March 2021 winter period?**

A27. The winter of 2020-21 resulted in a total of 4,500 HDDs, representing 340 fewer HDDs than the normal of 4,840 HDDs, or 7.0% WTN. The actual weather was WTN in November, December, January and March by 16.7%, 4.8%, 9.6% and 19.1% respectively. February was CTN by 9.6%.

**Q28. How did GCR Plan sendout compare to actual sendout during the November 2020 through March 2021 winter period?**

A28. The actual GCR/GCC sendout during the winter period of November 2020 through March 2021 was 112.2 Bcf, or 6.7 Bcf lower than the Plan level of 118.9 Bcf, as illustrated in Exhibit A-9, line 6, columns (d) through (f).

**Q29. Why was DTE Gas's November 2020 through March of 2021 combined GCR/GCC sendout 6.7 Bcf lower than Plan?**

A29. The reasons that winter sendout was lower than Plan are as follows: a) 5.6 Bcf is due to lower than planned GCR and GCC sales volumes caused by WTN weather, and b) 1.1 Bcf of decreased company use and losses.

**Q30. How did DTE Gas's actual GCR supply purchases compare to normal Plan levels for the winter period November 2020 - March 2021?**

A30. GCR Supply purchases for the November 2020 through March 2021 period were approximately 47.2 Bcf, which is 1.2 Bcf above the Plan level of approximately 46.0 Bcf, as illustrated in Exhibit A-9, line 10, columns (d) through (f).

**Q31. Why were DTE Gas's actual GCR winter supply purchases 1.2 Bcf greater than GCR Plan?**

A31. GCR winter supply purchases were 1.2 Bcf greater than Plan primarily due to colder than normal weather in February and the monthly adjustments to Plan purchases based on updated information accumulated by each month's supply decision time. During each winter month and consistent with its filed GCR Plan, DTE Gas evaluated its supply needs based on actual and potential weather exposures, storage availability, CTN protection, Plan storage withdrawals, required storage balances and design day requirements. In addition, during the course of the program year, DTE Gas experienced consistent customer migration from GCC to GCR. Gas Customer Choice enrollment levels declined throughout the year by over 8,000 customers and GCC supply was reduced below Plan levels accordingly. Consequently, DTE Gas needed to supply these added customers with additional GCR supply gas, thus contributing to higher supply volumes from Plan.

**Q32. How did each winter month's GCR supply differ from GCR Plan and why?**

A32. November 2020 GCR supply was almost identical with the plan. December 2020 GCR supply was 0.8 Bcf lower than Plan in response to WTN November weather. January 2021 GCR supply was 0.5 Bcf higher than Plan due to lower storage balances experienced at that time. February 2021 GCR supply was 0.8 Bcf lower than Plan in response to WTN January weather. March 2021 supply was 2.3 Bcf higher than Plan, in response to CTN February weather and lower storage balances experienced at that time.

**Q33. How did the Company's actual winter 2020-21 storage operations compare to the 2020-2021 GCR Plan?**

A33. DTE Gas began the November 2020 through March 2021 winter period with 68.7 Bcf of gas in storage for GCR/GCC customers, which was 1.4 Bcf below the projected level of 70.1 Bcf as illustrated in Exhibit A-9, line 25, columns (d) through (f). The winter was predominantly WTN with lower sendout, resulting in an ending GCR/GCC storage balance on March 31, 2021 of 15.5 Bcf, or 4.3 Bcf higher than the 11.2 Bcf normal weather storage balance as illustrated in Exhibit A-9, line 32, columns (d) through (f).

**WINTER 2020-21 PEAK DAY OPERATIONS**

**Q34. How did the Company's actual winter peak day operations compare to GCR Plan for the 2020-21 GCR Year?**

A34. The 2020-21 winter peak day occurred on February 17, 2021. Total on-system sendout was 1.9 Bcf and total on-system storage withdrawals were 1.1 Bcf, or 56% of the total sendout. The average temperature for Detroit Metro area was 9° Fahrenheit. The planned peak day sendout was 2.5 Bcf, utilizing 1.7 Bcf of storage withdrawals for a mean weather temperature of -6° Fahrenheit. Refer to Exhibit A-13 for a summary of actual peak day operations for winter 2020-21 compared to the Company's planned peak day.

**GAS SUPPLY PHYSICAL CALL OPTION**

**Q35. What was the purpose of purchasing a 250,000 Dth/day or 237 MMcf/day Gas Supply Physical Call Option for January-February 2021?**

A35. Storage deliverability is an integral part of DTE Gas' supply portfolio. The Gas Supply Physical Call Option was necessary to compensate for a loss of storage deliverability due to a possible failure of the dehydration equipment at the Belle River Mills storage field and ensure that GCR/GCC service reliability was maintained.

**Q36. Did GCR/GCC mitigate the entire potential exposure that would have resulted from a failure of the dehydration equipment at Belle River Mills storage field?**

A36. No. The GCR/GCC customer group was allocated its share of the deliverability exposure that was directly attributable to a possible failure of the dehydration equipment at Belle River storage field based on its respective share of Peak Design Day storage withdrawal requirements each month.

**Q37. How much GCR/GCC storage deliverability would have been lost in the event of a dehydration equipment failure at the Belle River Mills storage field?**

A37. If the dehydration equipment at Belle River Mills storage field would have failed, GCR/GCC supply would have been short 309 MMCf/day on a Peak Design Day in January and 274 MMcf/day on a Peak Design Day in February.

**Q38. Was all GCR/GCC storage deliverability exposure described above mitigated?**

A38. No. Only a portion of the GCR/GCC storage deliverability described above was mitigated with a Gas Supply Physical Call Option for 250,000 Dth/day or 237 MMcf/day for any 10 days in January 2021 and February 2021.

**Q39. Why was the mitigated volume lower than the deliverability exposure for January 2021 and February 2021 Peak Design Day?**

A39. In the event that a failure of the dehydration equipment at Belle River Mills storage field occurred, the Gas Supply Physical Call Option would have mitigated at least 77% of the supply loss by the outage. The remaining 23% would have been procured on the spot market. DTE Gas believes that this was a prudent approach to ensure system reliability in the event of a failure of the dehydration equipment at Belle River Mills storage field.

**Q40. What strategic alternatives were evaluated to address the deliverability shortage described above?**

A40. Five fundamental strategic alternatives were identified to improve system reliability by mitigating the GCR/GCC deliverability exposure for the winter 2020-21. A team of representatives from Regulatory, Legal, Controllers Office, System Engineering Planning, Marketing and Gas Supply worked together to identify and analyze these alternatives. The five alternatives were as follows:

a. Purchasing just-in-time gas when needed
b. Increasing base gas inventory thus enhancing storage fields deliverability
c. Purchasing gas in November 2020 - January 2021 to increase storage balances over the winter 2020-21 thus enhancing storage fields deliverability
d. Buying a deliverability service through third party parking of gas in the DTE Gas storage fields thus enhancing storage fields deliverability
e. Buying a Gas Supply Physical Call Option service that would be utilized when and as needed to replace storage withdrawal shortfall volumes

All fundamental strategic alternatives and its various iterations are identified in Exhibit A-27.

**Q41. Please describe the strategic alternative of just-in-time gas purchases as mentioned above.**

A41. The strategic alternative of purchasing gas just-in-time is a reactive solution that consists of purchasing the GCR/GCC volume of gas needed to ensure that natural gas service to GCR/GCC customers is maintained if the dehydration equipment failed. The GCR/GCC gas would have been purchased on the daily market only when the natural gas service disruption was imminent and only for the volume needed at that time. The maximum volume of GCR/GCC gas purchased just-in-time if Peak Day weather would have occurred during the 2020-21 winter would have been approximately 0.2 Bcf per day. This strategic alternative was rejected because it has the highest risk as the required volume might not have been available when needed.

**Q42. Please describe the strategic alternative of increasing base gas inventory as mentioned above.**

A42. The strategic alternative of increasing the base gas inventory consists of purchasing 10 Bcf of GCR/GCC non-cyclable working gas to increase the base gas inventory which in turn would increase storage deliverability. The gas would have been purchased during the summer of 2020 to hold in inventory through the entire 2020-21 gas year. This strategic alternative was rejected because of the high costs associated with it and the lack of flexibility given the volume of gas needed.

**Q43. Please describe the strategic alternative of purchasing gas to hold in storage until summer 2021 as mentioned above.**

A43. The strategic alternative of purchasing gas to hold in storage until summer 2021 consists of GCR/GCC purchasing non-cyclable working gas to increase winter 2020-21 deliverability and mitigate the January, February and March 2021 deliverability exposure. The gas would have been purchased during or prior to January 2021 and would have been used to back off gas purchases during 2021 summer for the gas year 2021-22. The GCR/GCC volume needed was between 6.5 Bcf and 10 Bcf depending on the timing of gas purchases. This strategic alternative was rejected because of the high costs associated with it and the lack of flexibility given the volume of gas needed.

Line
No.

**Q44. Please describe the strategic alternative of buying a deliverability service through third party parking of gas as mentioned above.**

A44. A park is a transaction that consists of DTE Gas paying a third party to park (i.e. store) gas in DTE Gas's storage facility for a specified amount of time. A contract is structured that defines how much gas is received, the price, when the gas will be parked (i.e. stored) and when the third party can withdraw their gas from the Company's storage facility. Contract terms and conditions are defined between DTE Gas and the third party that the gas is procured from. The parked volume needed was between 6.5 Bcf and 10 Bcf depending on the timing when the gas would have been delivered to DTE Gas to be parked (i.e. stored). This strategic alternative was rejected because of the high costs associated with it and lack of flexibility given the volume of gas needed.

**Q45. Please describe the strategic alternative of buying a Gas Supply Physical Call Option service as mentioned above.**

A45. A Gas Supply Physical Call Option is a transaction that functions much like an insurance policy: DTE Gas is paying a third party to "stand-by" and be ready to deliver up to a maximum daily quantity of gas to the Company at citygate when DTE Gas "calls on it" (i.e. DTE Gas requires it), for a limited number of days. DTE Gas can call for any quantity of gas up to the contracted maximum daily quantity on any given day during the agreed upon months up to the maximum number of days contracted. A nominal fixed fee is paid to the third party regardless of whether DTE Gas requests gas delivery or not. If the call option is executed, DTE will typically pay the market price plus a premium.

Line
No.

**Q46. Which alternative did the company determine was the most reasonable and prudent?**

A46. For the reasons described above, the Company chose the Gas Supply Physical Call Option. This alternative was selected to improve system reliability because of its cost effectiveness, high reliability and high flexibility.

**Q47. What are the terms of the Gas Supply Physical Call Option?**

A47. DTE Gas purchased a Gas Supply Physical Call Option for 237 MMcf/d for any 10 days in January - February 2021, any 10 days in January - February 2022 and a renewal clause for any 10 days in January - February 2023. Should DTE Gas need additional supply, the option would be exercised for any quantity of gas up to 237 MMcf/d to be delivered by the supplier to DTE Gas during any 10 days of January and February (does not have to be consecutive days). DTE Gas pays a fixed $250,000 Demand Fee each year as a nominal premium which is not impacted by whether the gas is called for delivery or not. If the Gas Supply Physical Call Option is executed, DTE Gas will pay the MichCon gas price on the delivery day and a premium between $0.80 - $2.00 per Dth, depending on the quantity of gas delivered. Witness Schiffer further details the costs associated with the Gas Supply Physical Call Option in his testimony.

**Q48. Was the Gas Supply Physical Option excercised during the winter 2020-21?**

A48. No it was not.

Line
No.

**Q49. Is the 237 MMcf/d Gas Supply Physical Call Option a long-term solution?**

A49. No, it is not. The 237 MMcf/d Gas Supply Physical Call Option is a short-term interim solution for the winter 2020-21 and winter 2021-22 with the flexibility to extend it for another year while long term solutions are being identified, analyzed and implemented.

**Q50. Why did the Company believe it was reasonable and prudent to purchase a 237 MMcf/dway Gas Supply Physical Call Option to improve its system reliability?**

A50. The purchase of 237 MMcf/d Gas Supply Physical Call Option solved a significant portion of the storage deliverability exposure allocated to GCR as described above and it was the most flexible, cost effective and lower risk alternative.

**<u>YEAR CONCLUSION</u>**

**Q51. Were DTE Gas's operations for the operating year of 2020-21 reasonable and prudent?**

A51. Yes. DTE Gas's 2020-21 operations met the operational challenges while assuring that supply requirements of its customers were met. In light of these factors, it is my opinion that the Company's operations, purchase decisions, and gas costs were reasonable and prudent.

**Q52. Is DTE Gas seeking recovery of Company use and losses in this GCR Reconciliation case?**

A52. No. The cost related to Company use and losses is included in DTE Gas's General Rate Case, not the GCR Reconciliation case.

Line
No.

**Q53. Does this conclude your direct testimony?**

A53. Yes, it does.

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021. | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

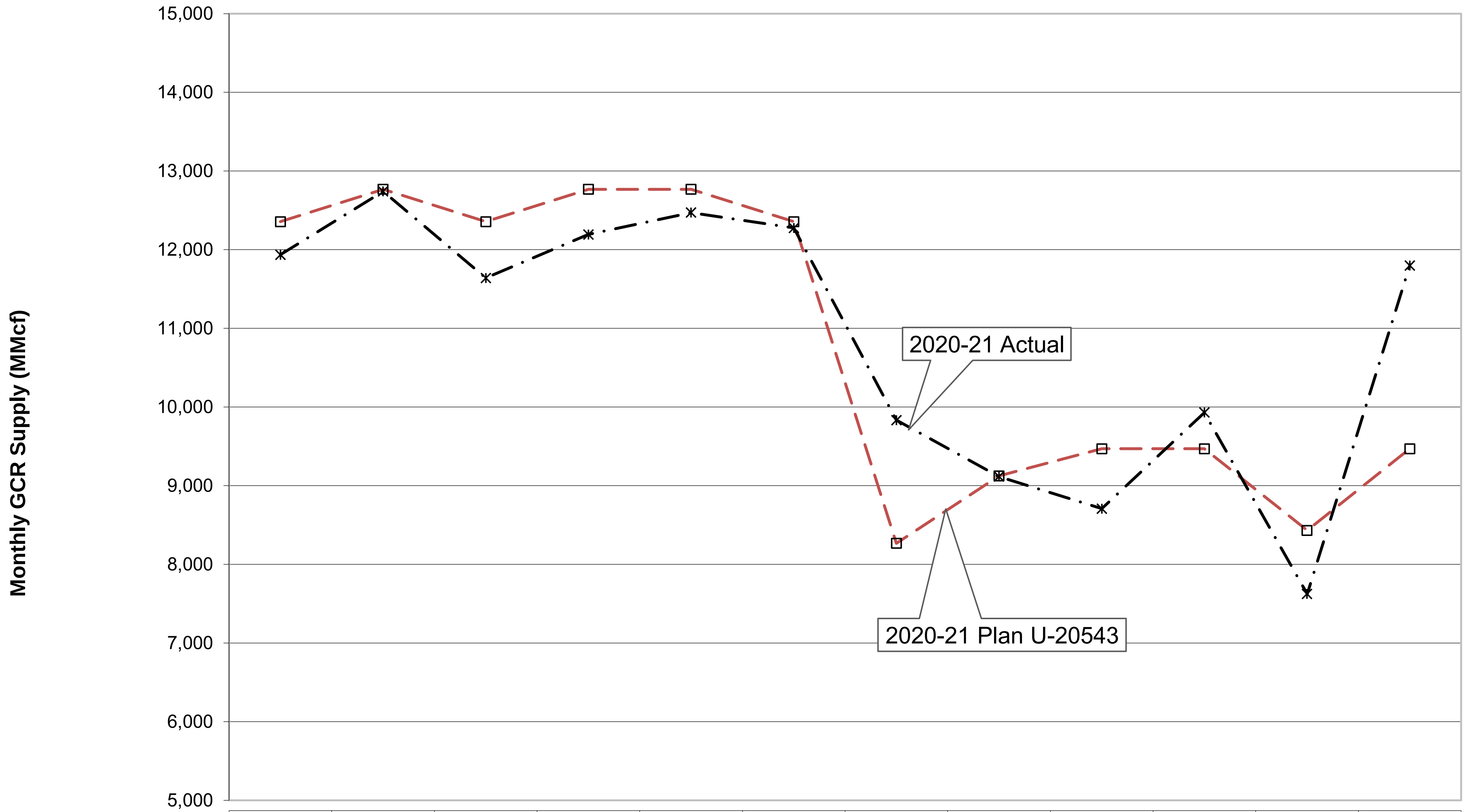
EXHIBITS

OF

LUCIAN BRATU

Case No.: U-20544
Exhibit: A-8
Witness: L. Bratu
Page: 1 of 1

## 2020-21 Plan vs Actual Monthly GCR Supply




| | Apr-20 | May-20 | Jun-20 | Jul-20 | Aug-20 | Sep-20 | Oct-20 | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-20543 Plan | 12,355 | 12,767 | 12,355 | 12,767 | 12,767 | 12,355 | 8,267 | 9,124 | 9,470 | 9,470 | 8,431 | 9,470 |
| Actuals | 11,935 | 12,741 | 11,641 | 12,193 | 12,471 | 12,276 | 9,833 | 9,115 | 8,708 | 9,929 | 7,623 | 11,798 |

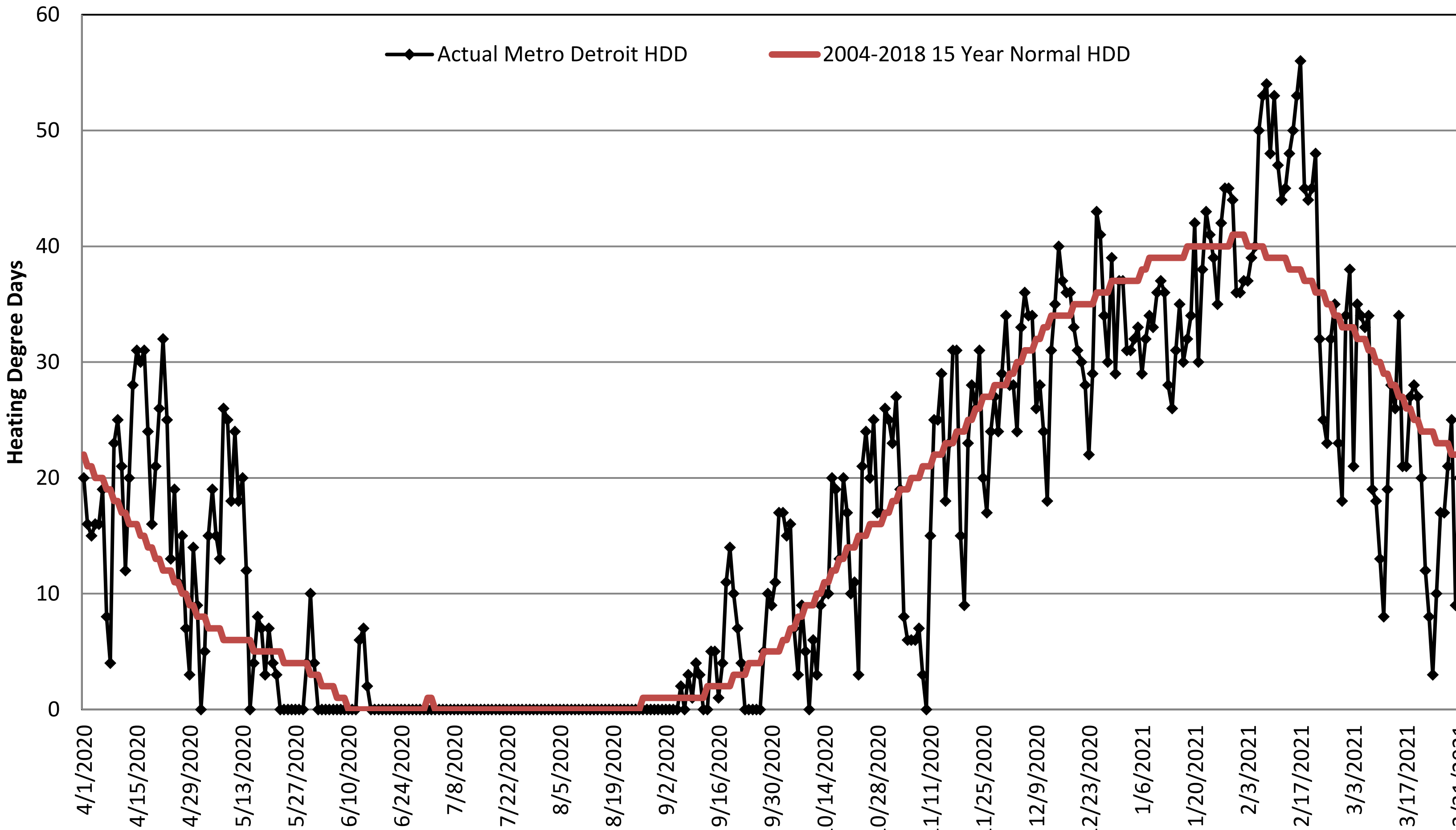
**Michigan Public Service Commission**
**DTE Gas Company**
**Planned Versus Actual**
**Source and Disposition**
**2020-21**

Case No.: U-20544
Exhibit: A-9
Witness: L. Bratu
Page: 1 of 1

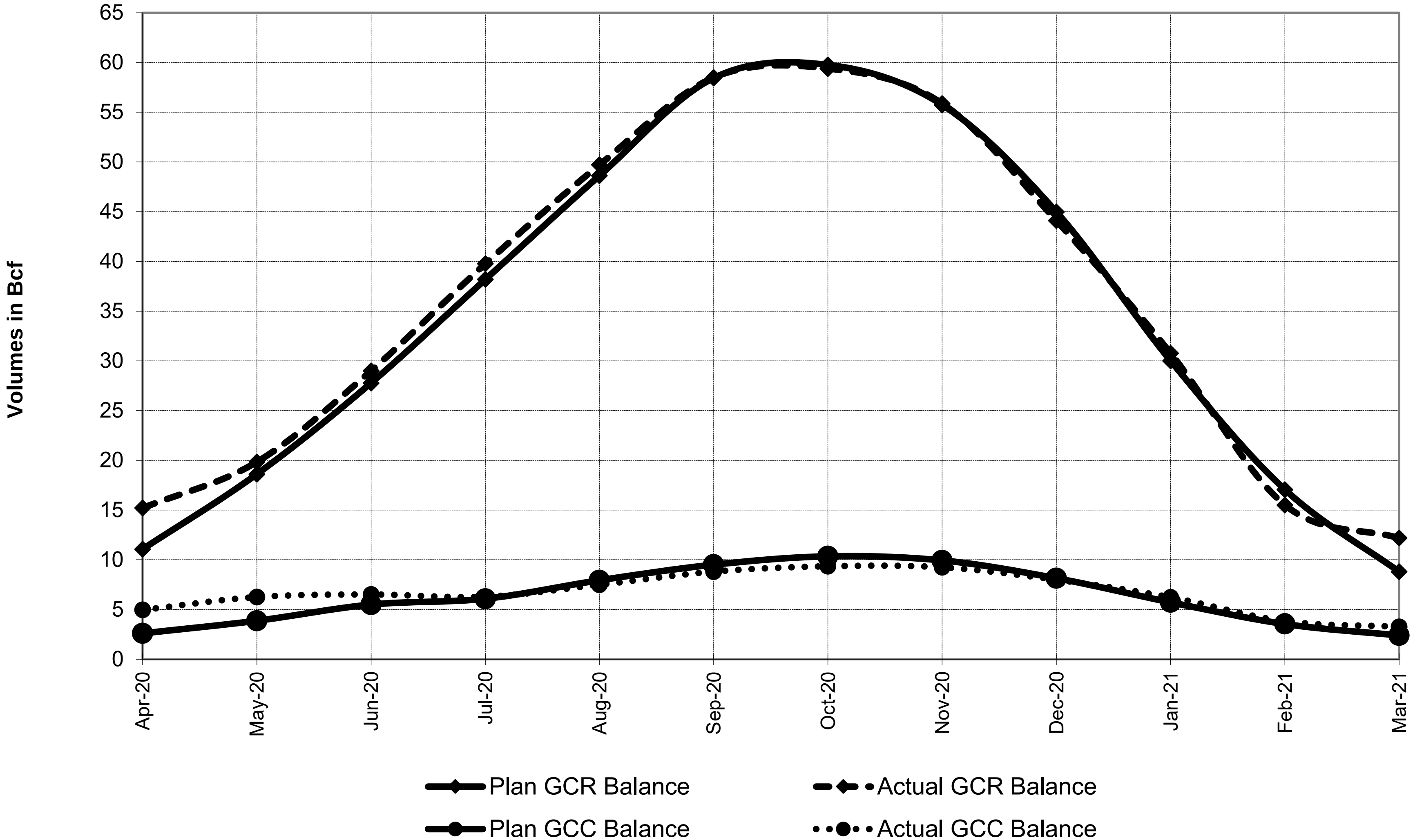
| LINE No. | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | APRIL '20 - OCTOBER '20 | | | NOVEMBER '20 - MARCH '21 | | | APRIL '20 - MARCH '21 | | |
| | | Projected | Actual | Variance | Projected | Actual | Variance | Projected | Actual | Variance |
| 1 | DISPOSITION | | | | | | | | | |
| 2 | GCR MARKETS | 32,255 | 35,798 | 3,543 | 94,162 | 92,222 | (1,940) | 126,417 | 128,021 | 1,603 |
| 3 | COMPANY USE & LOSSES | 4,178 | 4,557 | 379 | 5,112 | 4,034 | (1,078) | 9,290 | 8,591 | (699) |
| 4 | TOTAL GCR SENDOUT | 36,433 | 40,355 | 3,922 | 99,274 | 96,256 | (3,018) | 135,708 | 136,611 | 904 |
| 5 | GCC MARKETS | 7,297 | 6,466 | (831) | 19,651 | 15,984 | (3,668) | 26,948 | 22,449 | (4,499) |
| 6 | TOTAL SENDOUT | 43,730 | 46,821 | 3,091 | 118,926 | 112,240 | (6,686) | 162,656 | 159,061 | (3,595) |
| 7 | GCR/GCC Markets | 39,552 | 42,264 | 2,712 | 113,814 | 108,206 | (5,608) | 153,366 | 150,470 | (2,896) |
| 8 | | | | | | | | | | |
| 9 | FLOWING SUPPLY | | | | | | | | | |
| 10 | Purchased Gas @14.65 Delivered | 83,635 | 83,091 | (544) | 45,966 | 47,174 | 1,208 | 129,601 | 130,265 | 664 |
| 11 | Exchanges/Gas in Kind | 3,760 | 4,612 | 852 | 2,360 | 1,946 | (414) | 6,119 | 6,558 | 439 |
| 12 | TOTAL GCR SUPPLY | 87,395 | 87,703 | 309 | 48,326 | 49,120 | 794 | 135,721 | 136,823 | 1,102 |
| 13 | TOTAL GCC SUPPLY | 15,236 | 11,288 | (3,947) | 11,699 | 9,902 | (1,797) | 26,935 | 21,191 | (5,744) |
| 14 | TOTAL SUPPLY | 102,630 | 98,992 | (3,638) | 60,026 | 59,022 | (1,003) | 162,656 | 158,014 | (4,642) |
| 15 | | | | | | | | | | |
| 16 | GCR ONLY STORAGE ACTIVITY | | | | | | | | | |
| 17 | INITIAL STORAGE BALANCE | 8,792 | 12,044 | 3,253 | 59,753 | 59,392 | (360) | 8,792 | 12,044 | 3,253 |
| 18 | STORAGE IN / (OUT) | 50,961 | 47,348 | (3,613) | (50,948) | (47,136) | 3,812 | 13 | 212 | 199 |
| 19 | | | | | | | | | | |
| 20 | GCC ONLY STORAGE | | | | | | | | | |
| 21 | INITIAL STORAGE BALANCE | 2,409 | 4,530 | 2,120 | 10,348 | 9,352 | (996) | 2,409 | 4,530 | 2,120 |
| 22 | STORAGE IN / (OUT) | 7,939 | 4,823 | (3,116) | (7,952) | (6,082) | 1,870 | (13) | (1,259) | (1,246) |
| 23 | | | | | | | | | | |
| 24 | TOTAL GCR & GCC STORAGE | | | | | | | | | |
| 25 | INITIAL STORAGE BALANCE | 11,201 | 16,574 | 5,373 | 70,101 | 68,745 | (1,356) | 11,201 | 16,574 | 5,373 |
| 26 | STORAGE IN / (OUT) | 58,900 | 52,171 | (6,729) | (58,900) | (53,218) | 5,682 | 0 | (1,047) | (1,047) |
| 27 | | | | | | | | | | |
| 29 | GCR ENDING STORAGE BALANCE | 59,753 | 59,392 | (360) | 8,805 | 12,256 | 3,451 | 8,805 | 12,256 | 3,452 |
| 30 | GCC ENDING STORAGE | 10,348 | 9,352 | (996) | 2,396 | 3,271 | 875 | 2,396 | 3,271 | 875 |
| 31 | | | | | | | | | | |
| 32 | TOTAL GCR & GCC ENDING BALANCE | 70,101 | 68,745 | (1,356) | 11,201 | 15,527 | 4,326 | 11,201 | 15,527 | 4,326 |
| 33 | | | | | | | | | | |
| 34 | TOTAL STORAGE BALANCE (including Storage Service & EUT) | 133,737 | 135,296 | 1,559 | 32,953 | 40,163 | 7,210 | 32,953 | 40,163 | 7,210 |
| 35 | | | | | | | | | | |
| 36 | MONTHLY WEATHER (HDD'S) | 1,080 | 1,373 | 293 | 4,840 | 4,500 | (340) | 5,920 | 5,873 | (47) |
| 37 | % Colder / (Warmer) Than Normals 15 Year (2004-2018) Total Company | | | 27.1% | | | (7.0%) | | | (0.8%) |

Case No.: U-20544
Exhibit: A-10
Witness: L. Bratu
Page: 1 of 1

# DTE GAS COMPANY
## April 2020 - March 2021
## Heating Degree Days for Metro Detroit
## Normal vs Actual



## DTE Gas Company
## GCR and GCC End of Month Storage Balance
## April 1, 2020 - March 31, 2021 Plan vs Actual




Source: Exhibit A-12, lines 27 and 28

**Michigan Public Service Commission**
**DTE Gas Company**
**Planned Versus Actual**
**Source and Disposition**
**2020-21**

Case No.: U-20544
Exhibit: A-12
Witness: L. Bratu


| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|---|
| LINE | | APRIL '20 | | | MAY '20 | | | JUNE '20 | | |
| No. | | Projected | Actual | Variance | Projected | Actual | Variance | Projected | Actual | Variance |
| 1 | DISPOSITION | | | | | | | | | |
| 2 | GCR MARKETS | 10,048 | 11,027 | 979 | 5,250 | 5,931 | 681 | 2,825 | 2,689 | (136) |
| 3 | COMPANY USE & LOSSES | 544 | 39 | (505) | 555 | 1,322 | 767 | 915 | 611 | (303) |
| 4 | TOTAL GCR SENDOUT | 10,591 | 11,065 | 474 | 5,805 | 7,253 | 1,448 | 3,740 | 3,301 | (439) |
| 5 | GCC MARKETS | 2,126 | 1,844 | (282) | 1,137 | 1,139 | 2 | 694 | 366 | (328) |
| 6 | TOTAL SENDOUT | 12,718 | 12,909 | 192 | 6,942 | 8,392 | 1,451 | 4,433 | 3,666 | (767) |
| 7 | GCR/GCC Markets | 12,174 | 12,871 | 697 | 6,387 | 7,070 | 684 | 3,518 | 3,055 | (464) |
| 8 | | | | | | | | | | |
| 9 | FLOWING SUPPLY | | | | | | | | | |
| 10 | Purchased Gas @14.65 Delivered | 12,355 | 11,935 | (420) | 12,767 | 12,741 | (26) | 12,355 | 11,641 | (714) |
| 11 | Exchanges/Gas in Kind | 515 | 2,290 | 1,775 | 579 | (859) | (1,439) | 548 | 823 | 275 |
| 12 | TOTAL GCR SUPPLY | 12,870 | 14,225 | 1,355 | 13,347 | 11,882 | (1,465) | 12,903 | 12,464 | (439) |
| 13 | TOTAL GCC SUPPLY | 2,324 | 2,278 | (46) | 2,402 | 2,432 | 31 | 2,324 | 623 | (1,701) |
| 14 | TOTAL SUPPLY | 15,195 | 16,503 | 1,309 | 15,748 | 14,314 | (1,434) | 15,228 | 13,087 | (2,141) |
| 15 | | | | | | | | | | |
| 16 | GCR ONLY STORAGE ACTIVITY | | | | | | | | | |
| 17 | INITIAL STORAGE BALANCE | 8,792 | 12,044 | 3,253 | 11,071 | 15,204 | 4,134 | 18,612 | 19,833 | 1,221 |
| 18 | STORAGE IN / (OUT) | 2,279 | 3,160 | 881 | 7,542 | 4,629 | (2,913) | 9,164 | 9,163 | (1) |
| 19 | | | | | | | | | | |
| 20 | GCC ONLY STORAGE | | | | | | | | | |
| 21 | INITIAL STORAGE BALANCE | 2,409 | 4,530 | 2,120 | 2,607 | 4,963 | 2,356 | 3,872 | 6,257 | 2,385 |
| 22 | STORAGE IN / (OUT) | 198 | 434 | 236 | 1,265 | 1,293 | 28 | 1,631 | 258 | (1,373) |
| 23 | | | | | | | | | | |
| 24 | TOTAL GCR & GCC STORAGE | | | | | | | | | |
| 25 | INITIAL STORAGE BALANCE | 11,201 | 16,574 | 5,373 | 13,678 | 20,168 | 6,490 | 22,485 | 26,090 | 3,605 |
| 26 | STORAGE IN / (OUT) | 2,477 | 3,594 | 1,117 | 8,807 | 5,922 | (2,885) | 10,795 | 9,421 | (1,374) |
| 27 | | | | | | | | | | |
| 29 | GCR ENDING STORAGE BALANCE | 11,071 | 15,204 | 4,134 | 18,612 | 19,833 | 1,221 | 27,776 | 28,996 | 1,220 |
| 30 | GCC ENDING STORAGE | 2,607 | 4,963 | 2,356 | 3,872 | 6,257 | 2,385 | 5,503 | 6,514 | 1,011 |
| 31 | | | | | | | | | | |
| 32 | TOTAL GCR & GCC ENDING BALANCE | 13,678 | 20,168 | 6,490 | 22,485 | 26,090 | 3,605 | 33,279 | 35,511 | 2,231 |
| 33 | | | | | | | | | | |
| 34 | TOTAL STORAGE BALANCE (including Storage Service & EUT) | 51,181 | 79,896 | 28,715 | 66,935 | 98,407 | 31,472 | 82,924 | 113,228 | 30,304 |
| 35 | | | | | | | | | | |
| 36 | MONTHLY WEATHER (HDD'S) | 460 | 561 | 101 | 171 | 269 | 98 | 17 | 19 | 2 |
| 37 | % Colder / (Warmer) Than Normals 15 Year (2004-2018) Total Company | | | 22.0% | | | 57.3% | | | 11.8% |

**Michigan Public Service Commission**
**DTE Gas Company**
**Planned Versus Actual**
**Source and Disposition**
**2020-21**



| LINE No. | | (a) JULY '20 Projected | (b) JULY '20 Actual | (c) JULY '20 Variance | (d) AUGUST '20 Projected | (e) AUGUST '20 Actual | (f) AUGUST '20 Variance | (g) SEPTEMBER '20 Projected | (h) SEPTEMBER '20 Actual | (i) SEPTEMBER '20 Variance |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DISPOSITION | | | | | | | | | |
| 2 | GCR MARKETS | 2,307 | 1,801 | (506) | 2,274 | 2,138 | (137) | 2,757 | 3,318 | 560 |
| 3 | COMPANY USE & LOSSES | 615 | 781 | 166 | 609 | 772 | 163 | 279 | 561 | 283 |
| 4 | TOTAL GCR SENDOUT | 2,921 | 2,582 | (340) | 2,884 | 2,909 | 26 | 3,036 | 3,879 | 843 |
| 5 | GCC MARKETS | 474 | 354 | (120) | 543 | 456 | (87) | 758 | 649 | (109) |
| 6 | TOTAL SENDOUT | 3,395 | 2,936 | (459) | 3,426 | 3,365 | (61) | 3,794 | 4,528 | 734 |
| 7 | GCR/GCC Markets | 2,781 | 2,155 | (625) | 2,817 | 2,593 | (223) | 3,516 | 3,967 | 451 |
| 8 | | | | | | | | | | |
| 9 | FLOWING SUPPLY | | | | | | | | | |
| 10 | Purchased Gas @14.65 Delivered | 12,767 | 12,193 | (574) | 12,767 | 12,471 | (296) | 12,355 | 12,276 | (79) |
| 11 | Exchanges/Gas in Kind | 558 | 1,149 | 591 | 560 | 392 | (168) | 500 | 376 | (125) |
| 12 | TOTAL GCR SUPPLY | 13,325 | 13,342 | 16 | 13,327 | 12,864 | (464) | 12,856 | 12,652 | (204) |
| 13 | TOTAL GCC SUPPLY | 1,057 | 125 | (932) | 2,402 | 1,667 | (734) | 2,324 | 1,966 | (358) |
| 14 | TOTAL SUPPLY | 14,382 | 13,467 | (916) | 15,729 | 14,531 | (1,198) | 15,180 | 14,618 | (562) |
| 15 | | | | | | | | | | |
| 16 | GCR ONLY STORAGE ACTIVITY | | | | | | | | | |
| 17 | INITIAL STORAGE BALANCE | 27,776 | 28,996 | 1,220 | 38,180 | 39,756 | 1,576 | 48,624 | 49,711 | 1,087 |
| 18 | STORAGE IN / (OUT) | 10,404 | 10,760 | 356 | 10,444 | 9,954 | (489) | 9,820 | 8,773 | (1,047) |
| 19 | | | | | | | | | | |
| 20 | GCC ONLY STORAGE | | | | | | | | | |
| 21 | INITIAL STORAGE BALANCE | 5,503 | 6,514 | 1,011 | 6,086 | 6,285 | 199 | 7,945 | 7,496 | (448) |
| 22 | STORAGE IN / (OUT) | 583 | (230) | (812) | 1,859 | 1,212 | (648) | 1,566 | 1,317 | (249) |
| 23 | | | | | | | | | | |
| 24 | TOTAL GCR & GCC STORAGE | | | | | | | | | |
| 25 | INITIAL STORAGE BALANCE | 33,279 | 35,511 | 2,231 | 44,266 | 46,041 | 1,775 | 56,569 | 57,207 | 638 |
| 26 | STORAGE IN / (OUT) | 10,987 | 10,531 | (456) | 12,303 | 11,166 | (1,137) | 11,386 | 10,090 | (1,296) |
| 27 | | | | | | | | | | |
| 29 | GCR ENDING STORAGE BALANCE | 38,180 | 39,756 | 1,576 | 48,624 | 49,711 | 1,087 | 58,444 | 58,484 | 40 |
| 30 | GCC ENDING STORAGE | 6,086 | 6,285 | 199 | 7,945 | 7,496 | (448) | 9,511 | 8,813 | (698) |
| 31 | | | | | | | | | | |
| 32 | TOTAL GCR & GCC ENDING BALANCE | 44,266 | 46,041 | 1,775 | 56,569 | 57,207 | 638 | 67,955 | 67,297 | (658) |
| 33 | | | | | | | | | | |
| 34 | TOTAL STORAGE BALANCE (including Storage Service & EUT) | 99,106 | 117,527 | 18,421 | 115,727 | 125,345 | 9,618 | 130,130 | 136,297 | 6,166 |
| 35 | | | | | | | | | | |
| 36 | MONTHLY WEATHER (HDD'S) | 2 | - | (2) | 5 | - | (5) | 69 | 98 | 29 |
| 37 | % Colder / (Warmer) Than Normals 15 Year (2004-2018) Total Company | | | (100.0%) | | | (100.0%) | | | 42.0% |

**Michigan Public Service Commission**
**DTE Gas Company**
**Planned Versus Actual**
**Source and Disposition**
**2020-21**



| LINE No. | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | OCTOBER '20 | | | NOVEMBER '20 | | | DECEMBER '20 | | |
| | | Projected | Actual | Variance | Projected | Actual | Variance | Projected | Actual | Variance |
| 1 | DISPOSITION | | | | | | | | | |
| 2 | GCR MARKETS | 6,795 | 8,895 | 2,100 | 12,822 | 11,501 | (1,321) | 19,622 | 19,429 | (193) |
| 3 | COMPANY USE & LOSSES | 662 | 471 | (191) | 744 | 1,591 | 847 | 1,073 | 722 | (352) |
| 4 | TOTAL GCR SENDOUT | 7,457 | 9,366 | 1,909 | 13,567 | 13,092 | (474) | 20,695 | 20,151 | (545) |
| 5 | GCC MARKETS | 1,565 | 1,657 | 92 | 2,730 | 2,191 | (539) | 4,196 | 3,174 | (1,022) |
| 6 | TOTAL SENDOUT | 9,022 | 11,024 | 2,002 | 16,297 | 15,283 | (1,014) | 24,891 | 23,325 | (1,566) |
| 7 | GCR/GCC Markets | 8,359 | 10,552 | 2,193 | 15,553 | 13,692 | (1,861) | 23,818 | 22,603 | (1,215) |
| 8 | | | | | | | | | | |
| 9 | FLOWING SUPPLY | | | | | | | | | |
| 10 | Purchased Gas @14.65 Delivered | 8,267 | 9,833 | 1,566 | 9,124 | 9,115 | (9) | 9,470 | 8,708 | (762) |
| 11 | Exchanges/Gas in Kind | 499 | 441 | (57) | 435 | 462 | 27 | 455 | (275) | (730) |
| 12 | TOTAL GCR SUPPLY | 8,766 | 10,275 | 1,509 | 9,559 | 9,577 | 18 | 9,925 | 8,433 | (1,492) |
| 13 | TOTAL GCC SUPPLY | 2,402 | 2,196 | (205) | 2,324 | 2,086 | (238) | 2,402 | 1,924 | (478) |
| 14 | TOTAL SUPPLY | 11,168 | 12,471 | 1,303 | 11,883 | 11,663 | (220) | 12,327 | 10,357 | (1,970) |
| 15 | | | | | | | | | | |
| 16 | GCR ONLY STORAGE ACTIVITY | | | | | | | | | |
| 17 | INITIAL STORAGE BALANCE | 58,444 | 58,484 | 40 | 59,753 | 59,392 | (360) | 55,745 | 55,877 | 133 |
| 18 | STORAGE IN / (OUT) | 1,309 | 909 | (400) | (4,008) | (3,515) | 493 | (10,770) | (11,717) | (947) |
| 19 | | | | | | | | | | |
| 20 | GCC ONLY STORAGE | | | | | | | | | |
| 21 | INITIAL STORAGE BALANCE | 9,511 | 8,813 | (698) | 10,348 | 9,352 | (996) | 9,942 | 9,248 | (694) |
| 22 | STORAGE IN / (OUT) | 837 | 539 | (298) | (406) | (105) | 301 | (1,794) | (1,251) | 543 |
| 23 | | | | | | | | | | |
| 24 | TOTAL GCR & GCC STORAGE | | | | | | | | | |
| 25 | INITIAL STORAGE BALANCE | 67,955 | 67,297 | (658) | 70,101 | 68,745 | (1,356) | 65,687 | 65,125 | (562) |
| 26 | STORAGE IN / (OUT) | 2,146 | 1,448 | (698) | (4,414) | (3,620) | 794 | (12,564) | (12,968) | (404) |
| 27 | | | | | | | | | | |
| 29 | GCR ENDING STORAGE BALANCE | 59,753 | 59,392 | (360) | 55,745 | 55,877 | 133 | 44,975 | 44,160 | (815) |
| 30 | GCC ENDING STORAGE | 10,348 | 9,352 | (996) | 9,942 | 9,248 | (694) | 8,148 | 7,997 | (151) |
| 31 | | | | | | | | | | |
| 32 | TOTAL GCR & GCC ENDING BALANCE | 70,101 | 68,745 | (1,356) | 65,687 | 65,125 | (562) | 53,123 | 52,157 | (966) |
| 33 | | | | | | | | | | |
| 34 | TOTAL STORAGE BALANCE (including Storage Service & EUT) | 133,737 | 135,296 | 1,559 | 125,753 | 133,281 | 7,528 | 107,256 | 104,985 | (2,270) |
| 35 | | | | | | | | | | |
| 36 | MONTHLY WEATHER (HDD'S) | 356 | 426 | 70 | 690 | 575 | (115) | 1,038 | 988 | (50) |
| 37 | % Colder / (Warmer) Than Normals 15 Year (2004-2018) Total Company | | | 19.7% | | | (16.7%) | | | (4.8%) |

**Michigan Public Service Commission**
**DTE Gas Company**
**Planned Versus Actual**
**Source and Disposition**
**2020-21**

Case No.: U-20544
Exhibit: A-12
Witness: L. Bratu


| LINE No. | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | JANUARY '21 | | | FEBRUARY '21 | | | MARCH '21 | | |
| | | Projected | Actual | Variance | Projected | Actual | Variance | Projected | Actual | Variance |
| 1 | DISPOSITION | | | | | | | | | |
| 2 | GCR MARKETS | 23,808 | 22,633 | (1,175) | 20,868 | 23,967 | 3,099 | 17,042 | 14,692 | (2,350) |
| 3 | COMPANY USE & LOSSES | 1,174 | 989 | (185) | 969 | 83 | (886) | 1,152 | 649 | (503) |
| 4 | TOTAL GCR SENDOUT | 24,982 | 23,623 | (1,360) | 21,837 | 24,050 | 2,213 | 18,194 | 15,341 | (2,852) |
| 5 | GCC MARKETS | 4,825 | 3,851 | (974) | 4,354 | 4,060 | (294) | 3,546 | 2,707 | (839) |
| 6 | TOTAL SENDOUT | 29,808 | 27,474 | (2,334) | 26,190 | 28,110 | 1,919 | 21,740 | 18,048 | (3,692) |
| 7 | GCR/GCC Markets | 28,633 | 26,485 | (2,149) | 25,222 | 28,027 | 2,805 | 20,588 | 17,399 | (3,189) |
| 8 | | | | | | | | | | |
| 9 | FLOWING SUPPLY | | | | | | | | | |
| 10 | Purchased Gas @14.65 Delivered | 9,470 | 9,929 | 459 | 8,431 | 7,623 | (808) | 9,470 | 11,798 | 2,328 |
| 11 | Exchanges/Gas in Kind | 542 | 369 | (173) | 464 | 1,174 | 710 | 464 | 216 | (248) |
| 12 | TOTAL GCR SUPPLY | 10,012 | 10,298 | 286 | 8,895 | 8,797 | (98) | 9,935 | 12,014 | 2,080 |
| 13 | TOTAL GCC SUPPLY | 2,402 | 2,087 | (315) | 2,169 | 1,648 | (521) | 2,402 | 2,157 | (245) |
| 14 | TOTAL SUPPLY | 12,414 | 12,385 | (29) | 11,065 | 10,446 | (619) | 12,337 | 14,172 | 1,835 |
| 15 | | | | | | | | | | |
| 16 | GCR ONLY STORAGE ACTIVITY | | | | | | | | | |
| 17 | INITIAL STORAGE BALANCE | 44,975 | 44,090 | (885) | 30,005 | 30,765 | 761 | 17,064 | 15,513 | (1,550) |
| 18 | STORAGE IN / (OUT) | (14,970) | (13,325) | 1,645 | (12,941) | (15,252) | (2,311) | (8,259) | (3,327) | 4,932 |
| 19 | | | | | | | | | | |
| 20 | GCC ONLY STORAGE | | | | | | | | | |
| 21 | INITIAL STORAGE BALANCE | 8,148 | 7,997 | (151) | 5,725 | 6,233 | 508 | 3,541 | 3,821 | 280 |
| 22 | STORAGE IN / (OUT) | (2,423) | (1,764) | 659 | (2,184) | (2,412) | (227) | (1,145) | (550) | 594 |
| 23 | | | | | | | | | | |
| 24 | TOTAL GCR & GCC STORAGE | | | | | | | | | |
| 25 | INITIAL STORAGE BALANCE | 53,123 | 52,087 | (1,036) | 35,730 | 36,998 | 1,268 | 20,604 | 19,334 | (1,270) |
| 26 | STORAGE IN / (OUT) | (17,393) | (15,089) | 2,304 | (15,126) | (17,664) | (2,538) | (9,403) | (3,877) | 5,526 |
| 27 | | | | | | | | | | |
| 29 | GCR ENDING STORAGE BALANCE | 30,005 | 30,765 | 761 | 17,064 | 15,513 | (1,550) | 8,805 | 12,186 | 3,382 |
| 30 | GCC ENDING STORAGE | 5,725 | 6,233 | 508 | 3,541 | 3,821 | 280 | 2,396 | 3,271 | 875 |
| 31 | | | | | | | | | | |
| 32 | TOTAL GCR & GCC ENDING BALANCE | 35,730 | 36,998 | 1,268 | 20,604 | 19,334 | (1,270) | 11,201 | 15,457 | 4,256 |
| 33 | | | | | | | | | | |
| 34 | TOTAL STORAGE BALANCE (including Storage Service & EUT) | 75,255 | 75,823 | 568 | 50,192 | 41,034 | (9,159) | 32,953 | 40,163 | 7,210 |
| 35 | | | | | | | | | | |
| 36 | MONTHLY WEATHER (HDD'S) | 1,213 | 1,097 | (116) | 1,058 | 1,160 | 102 | 841 | 680 | (161) |
| 37 | % Colder / (Warmer) Than Normals 15 Year (2004-2018) Total Company | | | (9.6%) | | | 9.6% | | | (19.1%) |

**Michigan Public Service Commission**
**DTE Gas Company**
**2020-2021 Peak Day Information**

Case No.: U-20544
Exhibit: A-13
Witness: L. Bratu
Page: 1 of 1

| | | (a) | (b) |
|---|---|---|---|
| Line No. | | **Actual Peak Day Activity** | **Plan Peak Day Activity** |
| 1 | DATE: | February 17, 2021 | End of Month January |
| 2 | MEAN TEMPERATURE (DETROIT): | 9° Fahrenheit | -6° Fahrenheit |
| 3 | HEATING DEGREES (DETROIT): | 56 | 71 |
| 4 | TOTAL SENDOUT: | 1.9 Bcf | 2.5 Bcf |
| 5 | GCR, GCC & EUT Withdrawal: | 1.1 Bcf | 1.7 Bcf |
| 6 | Percent of sendout supplied from storage | 56% | 68% |
| 7 | STORAGE SERVICE Withdrawal: | 0.7 Bcf | 0.7 Bcf |
| 8 | TOTAL STORAGE Withdrawal: | 1.8 Bcf | 2.4 Bcf |

**Michigan Public Service Commission**
**DTE Gas Company**
**Temporary Alternatives for Belle River Dehydration Unit Failure**



| Line No. | (a) | (b) Options | (c) Requirement (Bcf) | (d) Cost If not Peak Day weather occurs ($MM) | (e) Cost If Peak Day weather occurs ($MM) | (f) Recommendation | (g) Comments |
|---|---|---|---|---|---|---|---|
| 1 | Case 1 | Just in time purchase | 0.2 | $0.0 | $1.3 | Reject | 1) **High risk supply** - the required volumes might not be available when needed<br>2) Prices could actually be higher than estimated |
| 2 | Case 2 | Increase base gas inventory | 10.0 | $3.3 | $3.3 | Reject | 1) High cost<br>2) Reduces Midstream available storage space which will reduce cost-offsetting revenues |
| 3 | Case 3 | Nov purchases, back off summer purchase | 10.0 | $4.2 | $4.2 | Reject | 1) High cost<br>2) Risk of cost increase if summer prices drop<br>3) Too much gas purchased in one month |
| 4 | Case 4 | Dec purchases, back off summer purchase | 10.0 | $8.7 | $8.7 | Reject | 1) High cost<br>2) Risk of cost increase if summer prices drop<br>3) Too much gas purchased in one month |
| 5 | Case 5 | Jan purchases, back off summer purchase | 7.3 | $6.2 | $6.2 | Reject | 1) High cost<br>2) Risk of cost increase if summer prices drop |
| 6 | Case 6 | 2 month Nov-Dec levelized purchase, back off summer purchase | 10.0 | $6.1 | $6.1 | Reject | 1) High cost<br>2) Risk of cost increase if summer prices drop<br>3) Too much gas purchased in one month |
| 7 | Case 7 | 2 month Dec-Jan levelized purchase, back off summer purchase | 6.5 | $6.3 | $6.3 | Reject | 1) High cost<br>2) Risk of cost increase if summer prices drop<br>3) Too much gas purchased in one month (Dec) |
| 8 | Case 8 | 3 month Nov-Jan levelized purchase, back off summer purchase | 7.0 | $5.7 | $5.7 | Reject | 1) High cost<br>2) Risk of cost increase if summer prices drop |
| 9 | Case 9 | Just in time park to summer | 0.2 | $0.0 | $0.7 | Reject | 1) **High risk supply** - the required volumes might not be available when needed<br>2) Prices could actually be higher than estimated |
| 10 | Case 10 | Nov to summer park | 10.0 | $2.7 | $2.7 | Reject | 1) High cost<br>2) Too much gas received in one month |
| 11 | Case 11 | Dec to summer park | 10.0 | $6.1 | $6.1 | Reject | 1) High cost<br>2) Too much gas received in one month |
| 12 | Case 12 | Jan to summer park | 7.3 | $5.0 | $5.0 | Reject | 1) High cost |
| 13 | Case 13 | 2 month Nov&Dec to summer park | 10.0 | $4.5 | $4.5 | Reject | 1) High cost<br>2) Too much gas received in one month |
| 14 | Case 14 | 2 month Dec&Jan to summer park | 6.5 | $4.2 | $4.2 | Reject | 1) High cost<br>2) To much gas received in one month (Dec) |
| 15 | Case 15 | 3 month Nov&Jan to summer park | 7.0 | $3.6 | $3.6 | Reject | 1) High cost |
| 16 | Case 16 | Jan-Feb 10 day gas supply call option | 0.2 | $0.25 fix cost | $1.6 | Recommend | 1) Cost effective<br>2) Most flexible<br>3) Reliable |

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021. | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

QUALIFICATIONS

AND

DIRECT TESTIMONY

OF

TIMOTHY J. KRYSINSKI

**DTE GAS COMPANY**
**QUALIFICATIONS OF TIMOTHY J KRYSINSKI**

Line
No.

**Q1. Please state your name, address, and by whom you are employed?**

A1. My name is Timothy J. Krysinski. My business address is One Energy Plaza, Detroit, Michigan 48226. I am employed by DTE Energy Corporate Services, LLC (DTE Energy) as a Principal Project Manager in the Regulatory Affairs Gas Strategy group.

**Q2. What is your educational background?**

A2. I have a Bachelor's degree in Accounting and a Master of Science degree in Finance. Both degrees were earned from Walsh College in Troy, Michigan.

**Q3. Do you hold any professional designations?**

A3. I am a Certified Public Accountant. My certification is from the Board of Examiners of the University of Illinois.

**Q4. Have you had other regulatory training?**

A4. I have attended seminars on regulatory topics held by the American Gas Association and the Edison Electric Institute. I also completed a two-day Regulatory and Rates seminar given by Electric Utility Consultants Inc., and a week-long Advanced Regulatory Studies Program given by the Institute of Public Utilities.

**Q5. What is your work experience?**

A5. I joined DTE Energy in 2002 as part of the Controllers Budget, Forecast and Reporting group where I was primarily responsible for internal management reporting. Early in 2005, I accepted the position of Senior Project Analyst in the

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Facilities, Design and Construction organization where I managed the capital appropriation process in support of their asset preservation program. Late in 2005, I transferred back into the Asset Management department in a Senior Business Financial Analyst role. My initial focus was to assist with implementation of the first wave of the enterprise business solution (EBS) migration. Subsequent responsibilities included budget appropriations, capital project tracking, Sarbanes-Oxley compliance testing, and depreciation work. In 2009, I transferred to a decision support role for Distribution Operations where I provided financial support to the regional managers responsible for Service Operations. In June 2013, I moved to the Regulatory Accounting & Strategy group within the Controllers organization where my responsibilities included researching regulatory accounting issues, drafting white papers, and participating in case filings. In April 2015, I was asked to return to the Asset Management department to assist with conversion activities associated with the launch of the PowerPlan asset system. In July 2016, I transferred to the Regulatory Affairs organization. I was promoted to Principal Project Manager in May 2018. Prior to joining DTE Energy, I spent several years working at various positions in the Accounting department and in the Customer Service organization at TRW Occupant Safety Systems located in Washington, Michigan.

**Q6. What are your responsibilities in your current position?**

A6. My primary responsibilities are monitoring proceedings before the Federal Energy Regulatory Commission (FERC) and the Canada Energy Regulator (CER) with the purpose of participating in proceedings that may materially affect DTE Gas and its customers. Participation can mean filing comments, or filing as an intervenor,

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and/or active, ongoing participation in contested cases or settlement negotiations. Additional responsibilities include forecasting rates for DTE Gas's interstate pipeline transporters, participating in DTE Gas's GCR proceedings before the Michigan Public Service Commission (MPSC), and researching issues related to Federal and State regulatory matters.

**Q7. Have you previously testified before any regulatory body?**

A7. Yes. I sponsored testimony to the MPSC in Case Nos. U-17762; U-17763; U-17941-R; U-18152; U-18412; U-20076; U-20210; U-20235; U-20236; U-20543 and U-20816. I also adopted testimony in MPSC Case No. U-17691-R.

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**Purpose of Testimony**

**Q8. What is the purpose of your testimony in this proceeding?**

A8. The purpose of my testimony is to discuss significant regulatory events and the regulatory actions taken by DTE Gas between April 2020 and March 2021 to minimize costs from its interstate pipeline transporters. Specifically, my testimony addresses: 1) DTE Gas's Federal regulatory policies related to pipeline transporters; 2) The ongoing rate case proceeding of Panhandle Eastern Pipeline Company (Panhandle) or (PEPL); 3) The settlement reached in the Viking Gas Transmission (Viking) case; 4) The ongoing Operational Flow Order (OFO) Panhandle waiver case; and 5) The rates charged by DTE Gas's natural gas pipeline transporters for transport service provided during the reconciliation period.

**Q9. Are you sponsoring any exhibits in this proceeding?**

A9. Yes. I am sponsoring the following exhibit:

| Exhibit | Description |
|---|---|
| A-14 | Applicable Rates of Pipeline Transporters April 2020 to March 2021 |

**Q10. Was this exhibit prepared by you or under your direction?**

A10. Yes.

**Federal Regulatory Policies**

**Q11. What were DTE Gas's Federal regulatory policies as they relate to its interstate pipeline transporters during the reconciliation period?**

A11. It is DTE Gas's policy to monitor and review all rate-related applications filed at the FERC and participate in proceedings that may impact DTE Gas's cost of gas.

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DTE Gas also monitors FERC rulemaking proceedings affecting pipeline regulation and follows other FERC and CER activity that may ultimately affect DTE Gas's pipeline transporters.

**Panhandle Section 5 and Section 4 proceedings**

**Q12. What action did FERC take in 2019 related to Panhandle Eastern Pipeline Company?**

A12. On January 16, 2019, in Docket No. RP19-78-000, FERC initiated an investigation, pursuant to Section 5 of the Natural Gas Act (NGA) (the "Panhandle Section 5 Case"), to determine whether the rates charged by Panhandle are just and reasonable and set the matter for hearing. Based upon a review of Panhandle's Form No. 501-G filing and information on file with the Commission, FERC stated that Panhandle may be over-recovering its cost of service, causing Panhandle's rates to be unjust and unreasonable.

**Q13. What subsequent actions were taken in the Panhandle Section 5 Case?**

A13. On April 1, 2019, Panhandle filed a cost and revenue study, which included actual costs for the 12-month period ending November 30, 2018. The cost and revenue study reflected an increase over Panhandle's currently existing rates. On May 20, 2019, FERC Trial Staff filed top sheets, which indicated a significant decrease in rates should take place. FERC Trial Staff also offered a black box settlement option, which was greater than the top sheets, but was still a decrease relative to current rates. Panhandle then offered a counter-settlement on June 5, 2019. Their counteroffer was higher than their original Section 5 as-filed amounts. When asked how they could support an increase over and above their as-filed Section 5 rates,

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Panhandle responded that they are now including a negative salvage depreciation component in their cost of service. Settlement talks stalled at that point. Lastly, on August 14, 2019, FERC Trial Staff filed their direct testimony in the Panhandle Section 5 Case. Their testimony reflected a decrease to the cost of service (below the top sheet amount and below their initial black box settlement offer). Table 1 shows the timing of these actions in the Panhandle Section 5 case and the related cost of service amounts.

**Table 1**

($000's) **Cost of Service Amounts**

| 1-Apr-19<br>RP19-78-000<br>Panhandle<br>As-Filed | 20-May-19<br>FERC<br>Trial Staff<br>Top Sheets | 20-May-19<br>Trial Staff<br>Black Box<br>Settlement Offer | 5-Jun-19<br>Panhandle<br>Settlement<br>Counter Offer | 14-Aug-19<br>FERC<br>Trial Staff<br>Direct Testimony |
|---|---|---|---|---|
| $341,772 | $255,755 | $278,000 | $363,547 | $239,417 |

**Q14. What event occurred on August 30, 2019?**

A14. On August 30, 2019, Panhandle filed a Section 4 general rate case in Docket No. RP19-1523-000. The Section 4 general rate case as-filed reflects a cost of service amount of $407.9 million. Panhandle stated that the principal factors supporting this increased cost of service include:

(a) establishment of a negative salvage rate and a terminal decommissioning expense;

(b) an increase in depreciation expense;

(c) an increase in taxes – other than income;

(d) an increase in return; and

(e) elimination of income taxes as a result of a change in corporate structure.

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**Q15. What change in corporate structure is Panhandle referring to in item (e) above?**

A15. Panhandle announced that they "restructured" their corporate entity ownership structure effective July 1, 2019. Panhandle stated it is now an indirect subsidiary of a master limited partnership, and therefore is no longer owned by an entity subject to federal income tax.

**Q16. Has FERC responded to the Panhandle Section 4 filing?**

A16. Yes, FERC issued a Hearing and Suspension Order on September 30, 2019. The Order accepted Panhandle's tariff records and suspended the rates subject to refund and subject to the outcome of a hearing and technical conference - making the rates effective beginning March 1, 2020. The Order also denied PEPL's request to terminate the Panhandle Section 5 Case proceedings and the Order granted Panhandle's motion to consolidate the Section 4 and the Section 5 proceedings citing administrative efficiency as the main reason.

**Q17. What impact does this Section 4 filing have on the transportation contract rates DTE Gas holds with Panhandle?**

A17. As of March 1, 2020, DTE Gas is now paying significantly higher rates for the same firm transportation service; an approximately 59% increase in rates.

**Q18. Has DTE Gas intervened in either the Section 5 or the Section 4 filings?**

A18. Yes, DTE Gas is an intervenor and an active participant in both filings.

**Q19. What specific actions has DTE Gas undertaken thus far?**

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A19. In addition to filing as an intervenor in both the Panhandle Section 5 Case (RP19-78-000) and the Section 4 case (RP19-1523-000), DTE Gas collaborated with outside counsel and other Michigan-based intervenors (including Consumers Energy Company, the Michigan Public Service Commission, and SEMCO Energy Gas Company) to advocate for near-term action in the Panhandle Section 5 Case. The intervenor parties advocated for near-term action in the Panhandle Section 5 Case which could have resulted in a rate decrease - prior to or shortly after - the rate increase that took effect on March 1, 2020 as a result of the Section 4 general rate case filing. In addition to the near-term rate decrease, the intervenor parties asserted that the Panhandle Section 5 Case (if litigated separately and sooner) might establish new "pre-existing lawful rates" which would lower the refund floor in the event the outcome of the Section 4 case is such that the new effective rates are below the as-filed Section 4 rates. The lower refund floor would mean greater refund amounts given back to DTE Gas's customers.

**Q20. Has DTE Gas filed any motions in either of the Panhandle proceedings?**

A20. Yes, on September 20, 2019, DTE Gas along with the other Michigan Parties filed an Answer in Opposition to Panhandle's Motion to terminate the Panhandle Section 5 Case. As noted above, the Commission Order on September 30, 2019 did not terminate the Panhandle Section 5 Case, but instead consolidated the proceeding with the Section 4 case. Also, on October 30, 2019, the Michigan Parties filed a Motion requesting clarification or rehearing. The Motion sought clarification with respect to an issue raised in Paragraph 36 of the Hearing and Suspension Order, where the Commission denied Panhandle's Motion to terminate the Panhandle Section 5 Case. Lastly, on April 30, 2020, DTE Gas and the Michigan Parties filed

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an Answer in Opposition to Panhandle's latest Motion to terminate the Panhandle Section 5 Case. On June 18, 2020, FERC issued their Order addressing the Michigan Parties Motions - the motions were denied. Additionally, Panhandle's second motion to terminate the Section 5 Proceeding was also denied.

**Q21. What is the current status of the Panhandle settlement talks?**

A21. Settlement talks were held over a period of several months. The last formal settlement conference was held via WebEx on April 23, 2020. At that conference, group discussions between all the parties took place, along with separate discussions and ALJ-lead breakout sessions designed to help the parties move toward settlement. In the end, it was recognized that the interveners and PEPL remained far apart on key issues. On August 24, 2020, the Judge declared an impasse and settlement talks ceased. The Section 4 and Section 5 litigated case schedule continued in parallel with the settlement talks.

**Q22. What is the status of the litigated case schedule?**

A22. The trial hearing (virtual cross examination) began on August 25, 2020 and concluded on September 16, 2020. Following motions to strike, reply motions, and post hearing briefs, the ALJ issued her initial decision on March 26, 2021. Exceptions were filed on April 26, 2021 and briefs opposing exceptions were filed May 17, 2021. The outcome of this case is still pending a final Commission order (expected sometime late 2021). In addition to a Commission order, the final outcome could be impacted by one or more rulings resulting from Petitions for Review filed with the D.C. Circuit Court of Appeals. To-date, two such Petitions have been filed by Panhandle.

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**Viking NGA Section 4 filing**

**Q23. Did Viking file a general rate case in 2019?**

A23. Yes, on June 28, 2019, in Docket No. RP19-1340-000 Viking filed a Section 4 general rate case. The as-filed rates reflect an increase of approximately 6% over DTE Gas's current contract rates. The as-filed cost of service is $37.5 million, which is an increase over the prior cost of service of $32.5 million that was filed in Viking's last general rate proceeding in Docket No. RP02-132-002, and which was retained in the Commission-approved settlement in Docket No. RP14-1185-000.

**Q24. Has FERC responded to the Viking Section 4 filing?**

A24. Yes. The Commission issued an Order on July 31, 2019. The Order accepted Viking's filed tariff records and suspended the rates subject to refund and subject to the outcome of a hearing, making them effective beginning January 1, 2020. The Commission further ordered that Viking must remove the cost of any facilities not placed in service before the end of the test period once the suspended rates go into effect. The Commission also terminated Viking's FERC Form No. 501-G filing as a result of this Section 4 general rate case filing.

**Q25. Did DTE Gas intervene in the Viking Section 4 general rate case proceeding?**

A25. Yes. DTE Gas took an active part in this proceeding. DTE Gas participated in the prehearing conference, all settlement conferences, and shipper group conference calls.

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**Q26. What is the current status of the Viking rate proceeding?**

A26. Following several months of negotiation and exchange, Viking filed an Offer of Settlement on February 28, 2020. The offer was supported or unopposed by all parties. Viking also filed for interim rates (identical to the settlement rates) to take effect as of March 1, 2020. The Chief Judge issued an order on February 21, 2020, granting approval of the interim rate filing. The Commission issued an order approving the uncontested settlement on July 1, 2020.

**Q27. What is the impact to the transport contract that DTE Gas has with Viking?**

A27. The rate that DTE Gas pays has decreased by 9.5%. This results in a savings to GCR customers of approximately $136,000 annually.

**Q28. What are the main provisions contained in the Viking Settlement?**

A28. Settlement rates became effective as of January 1, 2020. Refunds (with interest) for the first two months of 2020 were credited back to shippers in August 2020. Viking will begin amortizing the total excess deferred income tax (EDIT) balance as of January 1, 2018 of $8,895,410 (before income tax gross up) beginning January 1, 2020. The Commission's approval of the Settlement further authorized Viking to record a regulatory liability for EDIT. The balance as of January 1, 2018, will be amortized over twenty-three (23) years at an annual amount of $386,757 (prior to gross up). Viking will file their next general rate case under Section 4 of the NGA no later than three years after the Settlement effective date. There is no moratorium ('stay out provision') on Viking submitting a Section 4 general rate case, nor is there a moratorium on shippers filing a Section 5 complaint case.

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Lastly, the Offer of Settlement contains an appendix page listing the depreciation and negative salvage rates that were agreed to by all parties.

**Panhandle Request for Limited Waiver**

**Q29. Is DTE Gas an intervenor in any other cases pending before FERC?**

A29. Yes, DTE Gas is an intervenor in the ongoing Panhandle Request for Limited Waiver Determination (Docket No. RP21-616-000 filed on March 9, 2021) and two resulting Section 5 Complaint filings (Docket Nos. RP21-715-000 filed April 23, 2021 & RP21-813-000 filed April 30, 2021).

**Q30. What events led to Panhandle filing a limited waiver request?**

A30. On February 3, 2021 - in anticipation of extreme weather that was expected to hit across many parts of the Panhandle system - PEPL issued a critical notice followed by alert updates, calling for shipper actions that included minimizing over-takes and under-deliveries into PEPL's system.

During the period of February 13-18, a record-setting winter storm named "Winter Storm Uri" engulfed the central portion of the United States (including Texas, Oklahoma, and Louisiana) and brought with it plunging temperatures. The severe weather produced record snowfall and unprecedented freezing weather conditions which affected critical services like heat, electricity and water for millions of people, resulting in devastation and destruction of life and property.

On the morning of February 15, PEPL issued an update to the extreme weather alert notifying shippers that it was curtailing Field Zone auto-unpark nominations and that shippers would be subject to curtailment penalties if they did not comply with the curtailment. PEPL also advised the shippers that it may have to issue an Operational Flow Order (OFO) if shippers did not comply with the curtailment or to further protect the system.

In the early evening of February 15, Panhandle was required to issue a Notice of OFO because of the continued deterioration of the weather conditions and certain shippers' failure to adjust their pool nominations as previously requested in the earlier extreme weather alert.

Panhandle lifted the emergency weather alert restrictions on February 22, 2021.

**Q31. What was requested in the Panhandle waiver filing?**

A31. On March 9, PEPL filed (in Docket No. RP21-616-000) a Request for Limited Waiver Determination asking that FERC approve Panhandle's waiver of certain OFO penalties that shippers recently incurred on Panhandle's system. Specifically PEPL requested approval to waive approximately $50M of penalties assessed on Gas Day 15 (first gas day of the OFO); stating that short notice made compliance with the OFO impracticable. Panhandle did not propose to waive penalties associated with Gas Days 16, 17, and 18, [approximately $71M] reasoning that shippers who did not comply with the OFO on those days contributed to adverse system conditions.

> *"Panhandle relates as evidence the fact that eight shippers that violated the OFO on Gas Day 15 subsequently took actions and came into compliance for Gas Days 16, 17 and 18. According to*

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> *Panhandle, '[o]ther shippers' failure to bring their pool nominations into compliance for such days added to the operational issues on the system that necessitated the continuation of the OFO."*[1]

**Q32. Has FERC responded to the Panhandle limited waiver filing?**

A32. Yes, on March 25, 2021 FERC issued a letter Order approving Panhandle's waiver request, stating that the requested waiver was not unduly discriminatory and is consistent with Panhandle's tariff.

**Q33. Did the FERC Order address specific intervener requests to waive penalties after Gas Day 15?**

A33. No.

> *"Given that Panhandle only requested Commission approval to waive penalties on Gas Day 15, and that the Commenters do not claim that Panhandle's proposed waiver is unduly discriminatory, we find that the Commenters' request to waive penalties after Gas Day 15 is beyond the scope of this proceeding.* [Further] *Although we find that the issues raised with respect to Gas Days 16, 17, and 18 are not within the scope of this proceeding, we note that a shipper may file a complaint under section 5 of the NGA to the extent the shipper believes that Panhandle is not properly administering its tariff."*[2]

[1] FERC Order on Waiver of Penalties Docket No. RP21-616-000 Issued March 25, 2021
[2] *Id.*

**Q34. Were any rehearing requests filed as a result of the March 25 letter Order issued by FERC?**

A34. Yes. On April 23, 2021 Parties[3] filed requests for rehearing of the Commission's Order on PEPL's Request for Waiver of Penalties. Among other things, the Parties sought rehearing to determine:

> *Whether the March 25 Order is arbitrary and capricious, unsupported by substantial evidence, and not the product of reasoned decision making to the extent that it relied on Panhandle's baseless claims that it could not turn off its auto-unpark nominations function.*[4]

**Q35. Has FERC responded to the requests for rehearing?**

A35. Yes. On May 24, 2021 FERC issued a Notice of Denial of Rehearings by Operation of Law. As stated in the Code of Federal Regulations 18 C.F.R. § 385.713(f) unless the Commission acts upon a request for rehearing within 30 days after the request is filed, the request is denied.

**Q36. What other filings were made as a result of FERC's Order on the PEPL request for waiver?**

A36. Parties filed Section 5 Complaints[5] against PEPL. Key arguments of the Complainants include the following three points:

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[3] Parties include: ConocoPhillips Company, Direct Energy Business Marketing, LLC, Exelon Corporation, NextEra Energy Marketing, LLC and Spire Marketing Inc.
[4] Parties Request for Rehearing of March 25, 2021 Commission Order in RP21-616-000 filed April 23, 2021
[5] Docket Nos. RP21-715-000 filed April 23, 2021 & RP21-813-000 filed April 30, 2021

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1) Parties urged that expansion of Panhandle's waiver was warranted in light of the extraordinary severe conditions and high gas prices that persisted throughout the OFO Period.
2) Shippers on PEPL are also shippers on Southern Star and Gulf South - two pipelines that proposed extended waiver periods because they recognized the unprecedented nature of the weather event, and the fact that such conditions impeded many shippers' ability to comply with OFOs.
3) Parties noted, there was confusion regarding the auto-unpark nominations feature - and that limited shippers' ability to comply with the OFO and so further warranted an expanded waiver.

**Q37. How does the Panhandle waiver request and the subsequent filings impact DTE Gas?**

A37. DTE Gas, as a "non-offending" shipper on PEPL receives a proportionate amount of penalty credits. As stated in the General Terms & Conditions (GT&C) Section 25.2 of PEPL's tariff, the penalties that Panhandle actually collects (in excess of costs) are credited to non-offending, firm shippers.

**Q38. Has FERC responded to the Section 5 Complaint filings?**

A38. As of the writing of this testimony, FERC has not responded to the Section 5 Complaints. It is anticipated that FERC will either set the matter for hearing or issue a letter order to address all comments filed in those dockets.

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**Pipeline Refunds**

**Q39. Did DTE Gas receive any pipeline-related refunds during the April 2020 to March 2021 period?**

A39. Yes. DTE Gas received refunds and credits totaling $101,048 during the 12-month reconciliation period. DTE Gas received outage credits from ANR in the amount of $7,661, and from Great Lakes in the amount of $3,967. DTE Gas also received $37,394 from Viking due to the refund of the difference in rates as-filed in their Section 4 rate case in Docket No. RP19-1340-000; and the agreed-to settlement rates in that case. The Commission approved the Viking settlement on July 1, 2020 and Viking refunded the rate difference plus interest for the months of January and February, in August 2020. Viking also filed (in Docket No RP20-1135-000) for approval to allow Viking to perform a one-time cash out to shippers of a cumulative over-recovery position of its Deferred Gas Required for Operations (GRO) account balance. The one-time cash out was approved by FERC on September 30, 2020. DTE Gas received a refund of $52,026 from Viking.

**Pipeline Transportation Rates**

**Q40. What information is provided in Exhibit A-14 entitled "Applicable Rates of Pipeline Transporters April 2020 to March 2021"?**

A40. Exhibit A-14 provides the actual rates assessed by interstate pipeline transporters ANR Pipeline Company; Great Lakes Gas Transmission Limited Partnership; NEXUS Gas Transmission, LLC; Panhandle Eastern Pipe Line Company, L.P.; Vector Pipeline L.P.; and Viking Gas Transmission Company. Exhibit A-14 also provides the actual rates assessed by DTE Michigan Gathering (a non-interstate pipeline). These rates are the basis for the charges billed to and paid by DTE Gas

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for gas transportation during the April 2020 through March 2021 reconciliation period.

**Q41. Did any pipeline Reservation Rates vary from the 2020-2021 GCR Plan forecast?**

A41. Yes. Docket No. RP19-1340-000 caused the Reservation Rate for Viking Maximum Rate FT-A Contract AF0081 to decrease from $5.654 to $4.680 effective January 1, 2020.

**Q42. Were there any other rate variations?**

A42. Yes, a minor difference compared to the GCR Plan is the change in the ANR electric power cost (EPC) charge, which increased to $0.0011 from $0.0006 per/Dth effective April 1, 2020. The EPC charge is a usage-based surcharge assessed to allow ANR to recover the cost of electric power purchased for operational use. One other change to note; effective October 1, 2020 the FERC-assessed Annual Charge Adjustment clause (ACA) charge decreased from $0.0013 to $0.0011. The ACA charge is paid by the pipeline companies to help fund the Commission (for the current fiscal year). The ACA charge is recalculated each year and the trued-up rate becomes effective beginning with each new fiscal year starting October 1.

**Q43. Does this complete your direct testimony?**

A43. Yes, it does.

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of | ) | |
| **DTE GAS COMPANY** for reconciliation of | ) | |
| its gas cost recovery plan (Case No. U-20543) | ) | Case No. U-20544 |
| for the 12 months ended March 31, 2021. | ) | |
| ___________________________________________ | ) | |

EXHIBIT

Of

T. J. KRYSINSKI

**Michigan Public Service Commission**
**DTE Gas Company**
**Applicable Rates of Pipeline Transporters**
**April 2020 to March 2021**
Reservation rates shown are ($/Dth/Month) - except DTE Michigan Gathering (charges are $/Month)

Case No.: U-20544
Exhibit: A-14
Witness: T. J. Krysinski


| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | | | | | | 2020 | | | | | | 2021 | |
| No. | | April | May | June | July | August | September | October | November | December | January | February | March |
| | **ANR Pipeline Company Contracts** | | | | | | | | | | | | |
| | **Southwest Maximum Fixed Rate ETS Contracts Nos. 108268, 108304** | | | | | | | | | | | | |
| 1 | Total Reservation Rate | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 | $ 9.7320 |
| 2 | Total Usage Rate | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 |
| 3 | Fuel | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.53% | 2.53% | 2.53% |
| | **Southwest to Georgetown Maximum Fixed Rate FTS-1 Contract No. 109511** | | | | | | | | | | | | |
| 4 | Total Reservation Rate | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 | $ 11.0000 |
| 5 | Total Usage Rate | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 |
| 6 | Fuel | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.53% | 2.53% | 2.53% |
| 7 | **Discounted Detroit to Group 3 ETS Contract 112110** | | | | | | | | | | | | |
| 8 | Total Reservation Rate | $ 0.8963 | $ 0.8963 | $ 0.8963 | $ 0.8963 | $ 0.8963 | $ 0.8963 | $ 0.8985 | $ 0.8985 | $ 0.8985 | $ 0.8985 | $ 0.8985 | $ 0.8985 |
| 9 | Total Usage Rate | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 |
| | Fuel | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.56% | 0.56% | 0.56% |
| | **Marshfield to Menominee Maximum Rate FTS-1 Contract No. 122248** | | | | | | | | | | | | |
| 10 | Total Reservation Rate | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 |
| 11 | Total Usage Rate | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 |
| 12 | Fuel | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.56% | 0.56% | 0.56% |
| | **Winter-only REX Shelbyville to Willow Run (Michcon) Discount Rate FTS-1 Contract No. 132461** | | | | | | | | | | | | |
| 10 | Total Reservation Rate | | | | | | | | $ 5.1708 | $ 5.1708 | $ 5.1708 | $ 5.1708 | $ 5.1708 |
| 11 | Total Usage Rate | | | | | Winter Only | | | $ 0.0148 | $ 0.0148 | $ 0.0148 | $ 0.0148 | $ 0.0148 |
| 12 | Fuel | | | | | | | | 1.27% | 0.97% | 0.97% | 0.97% | 0.97% |

**Michigan Public Service Commission**
**DTE Gas Company**
**Applicable Rates of Pipeline Transporters**
**April 2020 to March 2021**
Reservation rates shown are ($/Dth/Month) - except DTE Michigan Gathering (charges are $/Month)



| Line No. | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | | | | | | | | | 2021 | | |
| | | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** | **January** | **February** | **March** |
| | **ANR Pipeline Company Contracts** | | | | | | | | | | | | |
| | **Alliance to Alpena Maximum Rate FTS-1 GCR Contract No. 122065** | | | | | | | | | | | | |
| 1 | Total Reservation Rate | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 | $ 5.7290 |
| 2 | Total Usage Rate | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0123 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 | $ 0.0121 |
| 3 | Fuel | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.61% | 0.56% | 0.56% | 0.56% |
| | **Southwest to Menominee (Winter) and Willow Run (Summer) Maximum Rate FTS-1 Contract No. 122067** | | | | | | | | | | | | |
| 4 | Total Reservation Rate | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 |
| 5 | Total Usage Rate | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 |
| 6 | Fuel | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.53% | 2.53% | 2.53% |
| | **Southwest to Willow Run Maximum Rate FTS-1 Contract No. 122247** | | | | | | | | | | | | |
| 7 | Total Reservation Rate | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 | $ 12.4690 |
| 8 | Total Usage Rate | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0238 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 | $ 0.0236 |
| 9 | Fuel | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.60% | 2.53% | 2.53% | 2.53% |
| | **Viking Gas Transmission Company Contract** | | | | | | | | | | | | |
| | **Maximum Rate FT-A Contract AF0081** | Settlement | | | | | | | | | | | |
| 10 | Total Reservation Rate | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 | $ 4.7580 |
| 11 | Total Usage Rate | $ 0.0149 | $ 0.0149 | $ 0.0149 | $ 0.0149 | $ 0.0149 | $ 0.0149 | $ 0.0147 | $ 0.0147 | $ 0.0147 | $ 0.0147 | $ 0.0147 | $ 0.0147 |
| 12 | Fuel | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.11% | 0.11% | 0.11% | 0.11% | 0.11% |

**Michigan Public Service Commission**
**DTE Gas Company**
**Applicable Rates of Pipeline Transporters**
**April 2020 to March 2021**
Reservation rates shown are ($/Dth/Month) - except DTE Michigan Gathering (charges are $/Month)



| Line No. | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | | | | | | | | | 2021 | | |
| | | April | May | June | July | August | September | October | November | December | January | February | March |
| | **Great Lakes Gas Transmission Limited Partnership Contracts** | | | | | | | | | | | | |
| | **Maximum Rate Central Zone Contract No. FT4634** | | | | | | | | | | | | |
| 1 | Total Reservation Rate | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 | $ 4.5860 |
| 2 | Total Usage Rate | $ 0.0067 | $ 0.0067 | $ 0.0067 | $ 0.0067 | $ 0.0067 | $ 0.0067 | $ 0.0065 | $ 0.0065 | $ 0.0065 | $ 0.0065 | $ 0.0065 | $ 0.0065 |
| 3 | Fuel (Rapid River) | 0.15% | 0.46% | 0.78% | 1.11% | 1.12% | 1.02% | 0.65% | 0.65% | 0.76% | 0.91% | 1.40% | 1.52% |
| 4 | Fuel (S.S. Marie, Pellston, and Gaylord) | 0.19% | 0.58% | 0.97% | 1.37% | 1.37% | 1.27% | 0.79% | 0.79% | 0.94% | 1.15% | 1.72% | 1.88% |
| | **Maximum Rate Eastern Zone Contract No. FT4635** | | | | | | | | | | | | |
| 5 | Total Reservation Rate | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 | $ 8.1860 |
| 6 | Total Usage Rate | $ 0.0108 | $ 0.0108 | $ 0.0108 | $ 0.0108 | $ 0.0108 | $ 0.0108 | $ 0.0106 | $ 0.0106 | $ 0.0106 | $ 0.0106 | $ 0.0106 | $ 0.0106 |
| 7 | Fuel (Belle River) | 0.25% | 0.75% | 1.25% | 1.75% | 1.75% | 1.65% | 1.00% | 1.00% | 1.20% | 1.50% | 2.20% | 2.40% |
| | **Panhandle Eastern Pipe Line Company, LP Contracts** | | | | | | | | | | | | |
| | **Field Zone to MichCon Maximum Rate EFT Contract No. 17908 (801 to 900 Miles)** | | | | | | | | | | | | |
| 8 | Total Reservation Rate | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 | $ 21.8544 |
| 9 | Total Usage Rate | $ 0.0551 | $ 0.0551 | $ 0.0551 | $ 0.0551 | $ 0.0551 | $ 0.0551 | $ 0.0549 | $ 0.0549 | $ 0.0549 | $ 0.0549 | $ 0.0549 | $ 0.0549 |
| 10 | Fuel | 4.54% | 4.54% | 4.54% | 4.54% | 4.54% | 4.54% | 4.54% | 4.30% | 4.30% | 4.30% | 4.30% | 4.30% |
| | **Field Zone to Rouge Maximum Rate FT Contract No. 18474** | | | | | | | | | | | | |
| 11 | Total Reservation Rate | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 | $ 20.6408 |
| 12 | Total Usage Rate | $ 0.0549 | $ 0.0549 | $ 0.0549 | $ 0.0549 | $ 0.0549 | $ 0.0549 | $ 0.0547 | $ 0.0547 | $ 0.0547 | $ 0.0547 | $ 0.0547 | $ 0.0547 |
| 13 | Fuel | 4.54% | 4.54% | 4.54% | 4.54% | 4.54% | 4.54% | 4.54% | 4.30% | 4.30% | 4.30% | 4.30% | 4.30% |

**Michigan Public Service Commission**
**Michigan Consolidated Gas Company**
**Applicable Rates of Pipeline Transporters**
**April 2020 to March 2021**
Reservation rates shown are ($/Dth/Month) - except DTE Michigan Gathering (charges are $/Month)

Case No.: U-20544
Exhibit: A-14
Witness: T. J. Krysinski


| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | | 2020 | | | | | | | | | 2021 | | |
| No. | | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** | **January** | **February** | **March** |
| | **NEXUS Gas Transmission, LLC** | | | | | | | | | | | | |
| | **Meter # N4995 NEXUS Interconnect with TELP Mainline, Clarington, OH to Meter # N1001 Ypsilanti, MI FT-1 Contract 860003** | | | | | | | | | | | | |
| 1 | Total Reservation Rate | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 | $ 25.7021 |
| 2 | Total Usage Rate | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 3 | Fuel | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% | 1.85% |
| | **Meter # N2002 NEXUS/Kensington Head of Phase II Ohio to Meter # N1001 Ypsilanti, MI FT-1 Contract 860003** | | | | | | | | | | | | |
| 4 | Total Reservation Rate | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 | $ 21.1396 |
| 5 | Total Usage Rate | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 6 | Fuel | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% | 1.26% |
| | **Vector Pipeline L.P. Contract** | | | | | | | | | | | | |
| | **Vector U.S. Discounted FT Contract No. MCG-5676** | | | | | | | | | | | | |
| 7 | Total Reservation Rate | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 | $ 4.2583 |
| 8 | Total Usage Rate | $ 0.0013 | $ 0.0013 | $ 0.0013 | $ 0.0013 | $ 0.0013 | $ 0.0013 | $ 0.0011 | $ 0.0011 | $ 0.0011 | $ 0.0011 | $ 0.0011 | $ 0.0011 |
| 9 | Fuel | 0.46% | 0.60% | 0.95% | 0.90% | 0.82% | 0.82% | 0.30% | 0.45% | 0.65% | 0.85% | 0.60% | 0.95% |
| | **DTE Michigan Gathering** | | | | | | | | | | | | |
| | **FT - Kalkaska-MichCon to Kalkaska-DTE Gas / Consumers-Goose Creek / Kalkaska-ANR / GLGT-Goose Creek - ASAT: 62078** | | | | | | | | | | | | |
| 10 | Monthly Reservation Charge | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 | $ 300.00 |
| 11 | Total Usage Rate | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 | $ 0.0363 |
| 12 | Fuel | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | **Construct Gaylord Interconnect Meter No. 80540** | | | | | | | | | | | | |
| 13 | Monthly Reservation Charge | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 | $ 800.00 |
| 14 | Total Usage Rate | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 15 | Fuel | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021.<br>______________________________________________ | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

QUALIFICATIONS

AND

DIRECT TESTIMONY

OF

GANDOLFO LORE

# DTE GAS COMPANY
# QUALIFICATIONS OF GANDOLFO LORE

Line No.

**Q1. Please state your name, address, and by whom you are employed?**

A1. My name is Gandolfo LoRe. My business address is: One Energy Plaza, Detroit, Michigan 48226.

**Q2. By whom are you employed and in what capacity?**

A2. I am employed by DTE Energy Corporate Services, LLC as a Manager supporting DTE Gas for the Controller's Organization.

**Q3. What is your educational background?**

A3. I graduated from Oakland University with a Bachelor of Science degree in Accounting and Finance.

**Q4. What is your employment history with DTE Energy?**

A4. I have worked for DTE Energy for over seventeen years in various accounting, finance and management positions. I have also provided accounting support to Company witnesses in various proceedings before the Michigan Public Service Commission. I am currently the Manager of Gross Margin Accounting for DTE Gas Company.

**Q5. What are your duties and responsibilities in your current position?**

A5. In my current position, I am responsible for the accounting and reporting of DTE Gas' revenue and cost of gas sold. I am also responsible for providing accounting support to Company witnesses in various DTE Gas proceedings before the Michigan Public Service Commission.

Line
No.

**Q6. Have you previously testified or submitted testimony in any Michigan Public Service Commission (MPSC or Commission) proceeding?**

A6. Yes. I've sponsored testimony and/or have provided support for the following MPSC Gas Cost Recovery cases:

DTE Gas 2019-20 GCR Reconciliation Case No. U-20236

DTE Gas 2018-19 GCR Reconciliation Case No. U-20210

DTE Gas 2017-18 GCR Reconciliation Case No. U-20076

DTE Gas 2016-17 GCR Reconciliation Case No. U-17941-R

**PURPOSE OF TESTIMONY**

**Q7. What is the purpose of your testimony?**

A7. My testimony addresses the monthly derivation of DTE Gas's Gas Cost Recovery (GCR) cost of gas sold, the over/(under) recovery of net recoverable costs, and the applicable interest expense for the months of April 2020 through March 2021.

**Q8. Are you sponsoring any exhibits in this proceeding?**

A8. Yes. I am sponsoring the following exhibits:

| Exhibit | Description |
|---|---|
| A-15 | April 2020 through March 2021 GCR Reconciliation |
| A-16 | Supplemental Data |
| A-17 | April 2020 through March 2021 GCR Storage Cost Calculation |
| A-18 | April 2020 through March 2021 GCR Interest Calculation |
| A-19 | April 2020 through March 2021 Reservation Charge (RC) Reconciliation for Gas Customer Choice (GCC) Customers |

**Q9. Were these exhibits prepared by you or under your direction?**

A9. Yes, they were.

**TOTAL GCR COST OF GAS SOLD**

**Q10. What was the Total GCR Cost of Gas Sold in the GCR Period?**

A10. The Total GCR Cost of Gas Sold in the GCR Period was $367 million, shown on Exhibit A-15, page 2, line 11, column n. The Total GCR Cost of Gas Sold is comprised of purchased gas costs, including storage costs, and costs related to sales with no GCR factor. The Average GCR Cost of Gas Sold based on this total is $2.87 per Mcf, shown on Exhibit A-15 page 2, line 12, column n. The Average GCR Cost of Gas Sold is calculated by dividing the GCR Cost of Gas Sold by the Total GCR Supplies for the year of 128.0 Bcf, shown on Exhibit A-15, page 1, line 7, column n.

**Q11. What is the Cost of Purchased Gas?**

A11. The Cost of Purchased Gas includes all amounts related to the gas that DTE Gas purchases from various suppliers including GCC suppliers, such as the cost of the commodity itself and the transportation costs incurred to bring gas to DTE Gas' system. The Cost of Purchased Gas is $368 million, shown on Exhibit A-15, page 2, line 1, column n. The costs related to the gas commodity and transportation, and their related volumes are detailed in Exhibit A-16, page 1, lines 1 through 25.

**Q12. Was there a Prior Period Storage Adjustment?**

A12. Yes, there was a $1.1 million adjustment for prior period storage. This adjustment is the difference between 1) the 2020 LIFO rate estimate when the books were closed for March 2020 and 2) the actual 2020 LIFO rate multiplied by 3) the January through March 2020 storage volumes that were included in DTE Gas's 2019 – 2020 GCR Reconciliation (Case No. U-20236). For the 2020 calendar year, the actual annual LIFO rate was $2.8161 per Mcf. As a result of the Commission's approval allowing DTE Gas to use an operational year, DTE Gas must finalize its reconciliation using an estimate of the LIFO rate for the last three months of the GCR period, January, February, and March. This estimate allows the reconciliation case to be filed in a timely manner. The true-up between this estimate and the actual rate is included as a

Line
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line item in the following year's GCR Reconciliation. The calculation of this amount is shown on Exhibit A-17, lines 18 – 22

**Q13. What was the cost of April through December 2020 storage activity?**

A13. The cost of April through December 2020 storage activity was negative $90 million. The net storage activity for the same period was a net injection of 32 Bcf, as shown on Exhibit A-17, line 11.

**Q14. Was there a net injection or withdrawal for calendar year 2020**

A14. During calendar year 2020, there was a net withdrawal of 0.1 Bcf at the 2018 LIFO rate of $3.3168 per Mcf as shown on Exhibit A-17, line 12.

**Q15. What cost was included for January through March 2021 storage withdrawals?**

A15. The cost of storage inventory withdrawals for January through March 2021 was $97 million. Net storage volumes of 32 Bcf for the first three months of 2021 are priced using the estimated 2021 LIFO rate, which is $3.05 per Mcf as shown on Exhibit A-17, lines 13 through 15, column b.

**Q16. What are the costs related to Sales with no GCR Factor?**

A16. Sales with no GCR factor include Company Use, Lost and Unaccounted for Gas (LAUF), and Gas In Kind (GIK). Exhibit A-15, page 2, lines 6 through 8, identify costs for Company Use, LAUF and GIK, respectively. These items were priced using the Jurisdictional Rate.

Line
No.

**Q17. What is the Jurisdictional Rate?**

A17. The Jurisdictional Rate is calculated by dividing the Cost of Purchased Gas, as shown on Exhibit A-15, page 2, line 1, column n, by the purchased gas volumes for the applicable GCR period, as shown on Exhibit A-15, page 1, line 1, column n. The Jurisdictional Rate for the 2020 – 2021 GCR period was $2.8192 per Mcf, as shown on Exhibit A-15, page 2, line 36, column b. This method of pricing Sales with no GCR Factor was approved by the MPSC in Case No. U-7777-R and has been used consistently in every one of DTE Gas' annual GCR Reconciliation cases thereafter.

**Q18. Are there any other costs related to Sales with no GCR Factor?**

A18. Yes, there are two other costs related to Sales with no GCR Factor. The first is Supplier Equalization Charge (SEC) Revenue, which is a fee charged to GCC Suppliers in instances where the cumulative Mcf quantity billed to customers for the Program Year exceeds the cumulative Supplier deliveries for the Program Year as defined more thoroughly in the DTE Gas Company Rate Book for Natural Gas Service (Rate Book) Sheet No. F-2.00. The second is Failure Fees, which is a fee charged to GCC Suppliers in the event that they do not deliver their monthly scheduled quantity of gas into the Company's system on behalf of their customers as more thoroughly explained on Sheet F-3.00 of the Rate Book. These Sales with no GCR Factor and non-GCR Sales are included as offsets to the GCR Cost of Gas Sold. SEC Revenue and Failure Fees incurred by GCC suppliers during the operational year are shown on Exhibit A-15, page 2, line 9. As shown on line 10 of that same page, DTE Gas did not have any non-GCR sales during this reconciliation period.

Line No.

**Q19. What are Net Recoverable Costs and how do they differ from the GCR cost of gas sold?**

A19. As shown on Exhibit A-15, page 2, line 18, column n, Net Recoverable Costs were $359 million for the 2020 – 2021 GCR year. The difference between Net Recoverable Costs and the GCR Cost of Gas Sold, as shown on Exhibit A-15, page 2, line 11, column n, is the amount related to items that are reflected in DTE Gas' GCR Reconciliation, but do not have an associated volume of gas and are therefore not included in the Cost of Gas Sold. In the 2020 – 2021 GCR year, these items are 1) the Allocated GCC Pipeline Reservation Cost (net of credits), 2) Prior Year GCR Over/(Under) Recovery, 3) Unauthorized Sales Penalties from End Use Transportation customers, and 4) Excess Storage Fees from End Use Transportation customers as shown on Exhibit A-15, page 2, lines 13 through 17, column n.

**PRIOR YEAR OVER/(UNDER)RECOVERY**

**Q20. What is the Prior Year Over/(Under)-recovery?**

A20. For the prior GCR plan year, DTE Gas had a $1 million over-recovery including interest. At the time this testimony was written, no final order had been issued in Case No. U-20236. This amount was rolled-in using prospective refunding, in accordance with the MPSC's order approving prospective refunding in Case No. U-10385 as an increase to the April 2020 Net Recoverable Costs as shown in Exhibit A-15, page 2, line 14, column b. This amount is the beginning balance used to calculate interest for the GCR period as shown in Exhibit A-18, page 1, line 1, column 2.

Line
No.

**GCR REVENUE**

**Q21. What was DTE Gas' GCR Revenue?**

A21. DTE Gas' GCR Revenues, on an unbilled basis, for April 2020 through March 2021 are $352 million as shown in Exhibit A-15, page 2, line 32, column n. Billed revenues are based on actual monthly customer billings. Unbilled revenues are calculated by multiplying the change in unbilled volumes for each month by the next month's billed GCR rate.

**GAS CUSTOMER CHOICE**

**Q22. Are there any amounts related to the GCC reconciliation included in your exhibits?**

A22. Yes. The amounts resulting from the 2019-2020 GCC reconciliation are included in my exhibits in the month of July 2020, the month the reconciliations were booked. There is 0.07 Bcf and $0.2 million resulting from the 2019 - 2020 GCC reconciliation included in July 2020, the month in which the reconciliations were recorded. These volumes and associated dollars can be found in Exhibit A-15, page 1, line 9, and on page 2, line 28. These costs and volumes are separate and distinct from the reconciliation of the RC for GCC Customers.

**OVER/(UNDER) RECOVERY AND INTEREST EXPENSE**

**Q23. How was the interest on the GCR monthly over or under-recovery as shown on Exhibit A-18, page 1 calculated?**

A23. Interest is calculated by multiplying the applicable interest rate by the average month-end cumulative over or under-recovery balance. Interest on under-recoveries is calculated at the average short-term borrowing rate available to the

Line No.

Company. In those months where an over-recovery exists, the interest rate is equal to DTE Gas authorized rate of return on common equity (ROE).

**Q24. What is the net over/under recovery for the GCR period?**

A24. The net under-recovery, including interest, for the GCR period is $5.4 million. This amount is shown in Exhibit A-18 page 1, line 15, column 3.

**RESERVATION CHARGE RECONCILIATION FOR GCC CUSTOMERS**

**Q25. How are pipeline reservation costs (net of credits) allocated to GCC customers calculated?**

A25. The pipeline reservation cost allocation calculates the percentage of total pipeline reservation cost to be allocated to GCR and GCC customers, including the 30% discount to GCC customers. The cost is allocated based on the percentage of total sales volumes (adjusted for the GCC discount) for GCR and GCC customers, as approved by the Commission in its May 30, 2018 Order in MPSC Case No. U-17691-R. The GCC reservation charge percentage, which was 10.47% for the period, was calculated by dividing the total GCC sales volumes by the total of GCR and GCC sales volumes and then multiplying that amount by 70%, to calculate the 30% discount allocation factor to GCC customers. The GCC customer percentage is then multiplied by the total pipeline reservation costs (net of credits) to get the total annual costs for GCC customers. GCR customers are allocated the difference between the total and the GCC customer portion of the total. This calculation and the underlying data can be found in Exhibit A-19 page 3 lines 1-12.

**Q26. What was the over(under) collection for GCC RC during the plan year?**

A26. The net over-recovery, including interest, for the GCR period was $2.0 million. This amount is shown on Exhibit A-19, page 2, line 15, column 3.

**Q27. Does the Company's reconciliation methodology properly attribute interest to the GCC customer classes?**

A27. Yes, the Company's reconciliation methodology calculates a separate balance for the GCC customers' RC over(under) collection with its own associated interest calculation, which equitably attributes the appropriate interest to the GCC customers.

**Q28. Would you please describe page 4 of Exhibit A-19?**

**A28.** This page provides a high-level summary that includes key information from Exhibit A-19 page 3. The summary provides information requested by Staff and is intended to highlight key components in determining the GCC Over/Under Recovery.

**Q29. Does this complete your direct testimony?**

A29. Yes, it does.

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021. | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

EXHIBITS

Of

G. LORE

**Michigan Public Service Commission**
**DTE Gas Company**
**April 2020 through March 2021 GCR Reconciliation**
**GCR CUSTOMERS GCR AND RESERVATION CHARGE**

Case No.: U-20544
Exhibit: A-15
Witness: G. LoRe


| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | | 2020 | | | | | | | | | 2021 | | | 12 Months |
| No. | Description | April | May | June | July | August | September | October | November | December | January | February | March | Mar 2021 |
| | Source of Gas | | | | | | | | | | | | | |
| 1 | Purchased | 13,666,331 | 11,301,951 | 11,883,317 | 12,785,020 | 12,349,606 | 12,177,496 | 9,798,372 | 9,166,473 | 7,972,099 | 9,817,480 | 8,256,056 | 11,526,289 | 130,700,490 |
| 2 | Net (To) From Storage | (3,160,020) | (4,628,714) | (9,163,152) | (10,760,103) | (9,954,187) | (8,773,248) | (908,647) | 3,515,054 | 11,717,268 | 13,324,898 | 15,252,318 | 3,326,724 | (211,809) |
| 3 | Total Supply | 10,506,311 | 6,673,237 | 2,720,165 | 2,024,917 | 2,395,419 | 3,404,248 | 8,889,725 | 12,681,527 | 19,689,367 | 23,142,378 | 23,508,374 | 14,853,013 | 130,488,681 |
| | Less Volumes For: Sales With No GCR Factor: | | | | | | | | | | | | | |
| 4 | Company Use | 379,864 | 463,834 | 368,775 | 255,126 | 262,922 | 250,204 | 231,738 | 278,389 | 258,231 | 307,788 | 377,486 | 355,110 | 3,789,467 |
| 5 | Lost and Unaccounted For Gas | (341,116) | 857,911 | 242,635 | 525,675 | 508,967 | 310,846 | 239,479 | 1,312,738 | 463,547 | 681,613 | (294,786) | 293,888 | 4,801,397 |
| 6 | Gas-in-Kind Provision | (558,969) | (579,793) | (580,569) | (556,963) | (514,030) | (474,432) | (476,450) | (410,552) | (461,161) | (480,439) | (541,209) | (488,132) | (6,122,699) |
| 7 | Total GCR Supplies | 11,026,532 | 5,931,285 | 2,689,324 | 1,801,079 | 2,137,560 | 3,317,630 | 8,894,958 | 11,500,952 | 19,428,750 | 22,633,416 | 23,966,883 | 14,692,147 | 128,020,516 |
| | GCR Sales | | | | | | | | | | | | | |
| 8 | Rate Schedule Sales (Billed) | 12,879,840 | 9,515,025 | 4,207,342 | 2,410,047 | 2,193,069 | 2,582,911 | 4,823,708 | 9,229,291 | 17,418,397 | 20,848,218 | 22,034,499 | 21,707,547 | 129,849,894 |
| 9 | GCC Rec: '19 - '20 Year | | | | 70,490 | - | - | - | - | - | - | - | - | 70,490 |
| 10 | Unbilled - Current Month | 7,261,692 | 3,677,952 | 2,159,934 | 1,480,476 | 1,424,967 | 2,159,686 | 6,230,936 | 8,502,597 | 10,512,950 | 12,298,148 | 14,230,532 | 7,215,132 | 77,155,002 |
| 11 | - Prior Month | (9,115,000) | (7,261,692) | (3,677,952) | (2,159,934) | (1,480,476) | (1,424,967) | (2,159,686) | (6,230,936) | (8,502,597) | (10,512,950) | (12,298,148) | (14,230,532) | (79,054,870) |
| 12 | Total GCR Sales (Unbilled) | 11,026,532 | 5,931,285 | 2,689,324 | 1,801,079 | 2,137,560 | 3,317,630 | 8,894,958 | 11,500,952 | 19,428,750 | 22,633,416 | 23,966,883 | 14,692,147 | 128,020,516 |

**Michigan Public Service Commission**
**DTE Gas Company**
**April 2020 through March 2021 GCR Reconciliation**

Case No.: U-20544
Exhibit: A-15
Witness: G. LoRe


| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | | 2020 | | | | | | | | | 2021 | | | |
| No. | Description | April | May | June | July | August | September | October | November | December | January | February | March | Year to Date |
| | GCR Cost of Gas Sold | | | | | | | | | | | | | |
| 1 | Purchased | $ 34,323,533 | $ 28,356,448 | $ 31,426,781 | $ 31,226,547 | $ 31,283,490 | $ 32,536,951 | $ 25,582,950 | $ 30,228,312 | $ 26,807,306 | $ 31,246,834 | $ 27,588,011 | $ 37,862,985 | $ 368,470,148 |
| 2 | Prior Period Storage Adjustment | (1,091,955) | - | - | - | - | - | - | - | - | - | - | - | (1,091,955) |
| 3 | Net (To) From Storage | (8,898,932) | (13,034,921) | (25,804,352) | (30,301,526) | (28,031,986) | (24,706,344) | (2,558,841) | 9,898,744 | 33,044,716 | 40,640,939 | 46,519,570 | 10,146,508 | 6,913,574 |
| 4 | Total Cost of Gas Sold | $ 24,332,646 | $ 15,321,527 | $ 5,622,429 | $ 925,021 | $ 3,251,504 | $ 7,830,607 | $ 23,024,109 | $ 40,127,056 | $ 59,852,022 | $ 71,887,773 | $ 74,107,581 | $ 48,009,493 | $ 374,291,767 |
| 5 | Less: Sales with No GCR Factor | | | | | | | | | | | | | |
| 6 | Company Use | 1,070,913 | 1,307,641 | 1,039,650 | 719,251 | 741,230 | 705,375 | 653,316 | 784,834 | 728,005 | 867,716 | 1,064,209 | 1,001,126 | 10,683,265 |
| 7 | Lost and Unaccounted For Gas | (961,674) | 2,418,623 | 684,037 | 1,481,983 | 1,434,880 | 876,337 | 675,139 | 3,700,871 | 1,306,832 | 1,921,603 | (831,061) | 828,529 | 13,536,098 |
| 8 | Gas-in-Kind Provision | (1,575,845) | (1,634,552) | (1,636,740) | (1,570,190) | (1,449,153) | (1,337,519) | (1,343,208) | (1,157,428) | (1,300,105) | (1,354,454) | (1,525,776) | (1,376,142) | (17,261,113) |
| 9 | Penalties & SEC Charges | - | - | 210 | 15,918 | 14,897 | - | - | 365,246 | 155 | 5,048 | 76,408 | - | 477,882 |
| 10 | Non-GCR Sales | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11 | GCR Cost of Gas Sold | $ 25,799,253 | $ 13,229,815 | $ 5,535,271 | $ 278,059 | $ 2,509,651 | $ 7,586,414 | $ 23,038,862 | $ 36,433,533 | $ 59,117,135 | $ 70,447,859 | $ 75,323,801 | $ 47,555,980 | $ 366,855,635 |
| 12 | Average GCR Cost of Gas Sold | $2.34 | $2.23 | $2.06 | $0.15 | $1.17 | $2.29 | $2.59 | $3.17 | $3.04 | $3.11 | $3.14 | $3.24 | $2.87 |
| 13 | Allocated GCC Pipeline Reservation Cost (net of credits) | $441,381 | $501,114 | $579,451 | $414,298 | $497,661 | $491,438 | $502,737 | $525,174 | $533,769 | $536,120 | $520,409 | $549,630 | 6,093,182 |
| 14 | Prior Year GCR Over/(Under) Recovery | 953,138 | - | - | - | - | - | - | - | - | - | - | - | 953,138 |
| 15 | Pipeline Refunds Interest | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | Unauthorized Sales Penalty | - | 65,860 | - | - | 4,318 | 4,165 | 20,052 | 11,925 | 6,025 | 213,679 | 59,802 | 43,957 | 429,783 |
| 17 | Excess Storage Fees | (2,282) | 2,282 | 58,990 | 68,667 | 84,568 | 64,013 | 64,902 | 80,471 | 88,027 | 55,027 | 69,705 | 71,047 | 705,417 |
| 18 | Net Recoverable Costs | $ 24,407,016 | $ 12,660,559 | $ 4,896,830 | $ (204,906) | $ 1,923,104 | $ 7,026,798 | $ 22,451,171 | $ 35,815,963 | $ 58,489,315 | $ 69,643,034 | $ 74,673,885 | $ 46,891,346 | $ 358,674,114 |
| | GCR Revenues | | | | | | | | | | | | | |
| 19 | Reservation Charge Billed | $0.38 | $0.38 | $0.42 | $0.42 | $0.42 | $0.42 | $0.42 | $0.42 | $0.42 | $0.42 | $0.42 | $0.42 | |
| 20 | Billed GCR Reservation Charge | 4,892,070 | 3,631,100 | 1,745,763 | 1,018,036 | 942,865 | 1,107,065 | 2,053,405 | 3,902,447 | 7,343,047 | 8,764,786 | 9,273,537 | 9,170,723 | 53,844,844 |
| 21 | Unbilled - Current Month | 2,759,442 | 1,544,738 | 907,174 | 621,801 | 598,485 | 907,066 | 2,616,994 | 3,571,089 | 4,415,441 | 5,165,223 | 5,976,824 | 3,030,355 | 32,114,632 |
| 22 | - Prior Month | (3,463,700) | (2,759,442) | (1,544,738) | (907,174) | (621,801) | (598,485) | (907,066) | (2,616,994) | (3,571,089) | (4,415,441) | (5,165,223) | (5,976,824) | (32,547,977) |
| 23 | Total GCR Reservation Charge | $ 4,187,812 | $ 2,416,396 | $ 1,108,199 | $ 732,663 | $ 919,549 | $ 1,415,646 | $ 3,763,333 | $ 4,856,542 | $ 8,187,399 | $ 9,514,568 | $ 10,085,138 | $ 6,224,254 | $ 53,411,499 |
| 24 | Maximum GCR Factor Permitted ($/Mcf) | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | $2.43 | |
| 25 | GCR Factor Billed ($/Mcf) | $2.20 | $2.20 | $2.43 | $2.43 | $2.43 | $2.43 | $2.46 | $2.46 | $2.46 | $2.35 | $2.25 | $2.25 | |
| 26 | Billed & Unbilled Resv Surch | | | | | | | | | | | | | |
| 27 | Billed GCR Revenue | $ 28,358,432 | $ 20,879,453 | $ 10,073,528 | $ 5,855,939 | $ 5,306,178 | $ 6,244,015 | $ 11,822,944 | $ 22,671,456 | $ 42,812,239 | $ 49,092,717 | $ 49,666,662 | $ 49,323,611 | $ 302,107,174 |
| 28 | GCC Rec: '19 - '20 Year | | | | 235,013 | | | | | | | | | 235,013 |
| 29 | Unbilled - Current Month | 15,975,722 | 8,937,423 | 5,248,640 | 3,597,557 | 3,462,670 | 5,312,828 | 15,328,103 | 20,916,389 | 24,705,433 | 27,670,833 | 32,018,697 | 16,234,047 | 179,408,342 |
| 30 | - Prior Month | (20,053,000) | (15,975,722) | (8,937,423) | (5,248,640) | (3,597,557) | (3,462,670) | (5,312,828) | (15,328,103) | (20,916,389) | (24,705,433) | (27,670,833) | (32,018,697) | (183,227,295) |
| 31 | Net GCR Revenue | $ 24,281,154 | $ 13,841,154 | $ 6,384,745 | $ 4,439,869 | $ 5,171,291 | $ 8,094,173 | $ 21,838,219 | $ 28,259,742 | $ 46,601,283 | $ 52,058,117 | $ 54,014,526 | $ 33,538,961 | $ 298,523,234 |
| 32 | Total GCR Revenue and Reservation Charge Revenue | $ 28,468,966 | $ 16,257,550 | $ 7,492,944 | $ 5,172,532 | $ 6,090,840 | $ 9,509,819 | $ 25,601,552 | $ 33,116,284 | $ 54,788,682 | $ 61,572,685 | $ 64,099,664 | $ 39,763,215 | $ 351,934,733 |
| 33 | Over (Under) Recovery | $ 4,061,950 | $ 3,596,991 | $ 2,596,114 | $ 5,377,438 | $ 4,167,736 | $ 2,483,021 | $ 3,150,381 | $ (2,699,679) | $ (3,700,633) | $ (8,070,349) | $ (10,574,221) | $ (7,128,131) | $ (6,739,381) |
| | Jurisdictional Rate Calculation | | | | | | | | | | | | | |
| 34 | Total Purchased ($) | $ 368,470,148 | | | | | | | | | | | | |
| 35 | Volumes Purchased (Mcf) | 130,700,490 | | | | | | | | | | | | |
| 36 | Jurisdictional Rate | $2.8192 | | | | | | | | | | | | |

**Michigan Public Service Commission**
**DTE Gas Company**
**April 2020 through March 2021 GCR Reconciliation**
**Supplemental Data**

Case No.: U-20544
Exhibit: A-16
Witness: G. LoRe


| Line No. | (a) Description | (b) 2020 April | (c) 2020 May | (d) 2020 June | (e) 2020 July | (f) 2020 August | (g) 2020 September | (h) 2020 October | (i) 2020 November | (j) 2020 December | (k) 2021 January | (l) 2021 February | (m) 2021 March | (n) Year to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Source of Gas | | | | | | | | | | | | | |
| 1 | Cashouts | (9,768) | (36,718) | 8,525 | 28,512 | 31,714 | 3,873 | (3,325) | (1,119) | (12,003) | (19,223) | (7,230) | (5,493) | (22,255) |
| 2 | Canadian Purchases - Great Lakes | 858,576 | 892,991 | 803,321 | 891,300 | 830,748 | 788,648 | 834,152 | 863,986 | 892,178 | 891,698 | 809,003 | 894,393 | 10,250,994 |
| 3 | Spot/Term Purchases | 11,086,445 | 11,884,795 | 10,829,292 | 11,273,046 | 11,608,967 | 11,483,544 | 9,002,543 | 8,252,501 | 7,827,922 | 9,056,828 | 6,821,351 | 10,909,226 | 120,036,460 |
| 4 | Intrastate | | | | | | | | | | | | | - |
| 5 | Exchange Gas | 1,731,078 | (1,439,117) | 242,179 | 592,162 | (121,823) | (98,569) | (34,998) | 51,105 | (735,998) | (111,823) | 632,932 | (271,837) | 435,291 |
| 6 | Reverse BTU Gain/(Loss) | 28 | 635 | (88) | (88) | (774) | 387 | (509) | 540 | - | - | - | | 131 |
| 7 | Exchange Gas - Adjusted | 1,731,050 | (1,439,752) | 242,267 | 592,250 | (121,049) | (98,956) | (34,489) | 50,565 | (735,998) | (111,823) | 632,932 | (271,837) | 435,160 |
| 8 | Other Purchased Gas | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 9 | Less: (Gain) Loss from BTU estimates | 28 | 635 | (88) | (88) | (774) | 387 | (509) | 540 | - | - | - | - | 131 |
| 10 | Total Purchased | 13,666,331 | 11,301,951 | 11,883,317 | 12,785,020 | 12,349,606 | 12,177,496 | 9,798,372 | 9,166,473 | 7,972,099 | 9,817,480 | 8,256,056 | 11,526,289 | 130,700,490 |
| | Cost of Gas | | | | | | | | | | | | | |
| 11 | Transportation | $ 206,303 | $ 204,143 | $ 250,837 | $ 123,600 | $ 186,214 | $ 181,129 | $ 113,459 | $ 191,810 | $ 197,125 | $ 234,473 | $ 162,511 | $ 239,216 | $ 2,290,820 |
| 12 | Cashouts | (17,606) | (73,765) | 11,156 | 38,975 | 38,058 | 5,542 | (6,269) | (7,723) | (30,010) | (49,636) | (21,468) | (25,316) | (138,062) |
| 13 | Pipeline Reservation Cost (net of credits) | 4,215,045 | 4,785,478 | 5,533,573 | 3,956,414 | 4,752,500 | 4,693,072 | 4,800,979 | 5,015,241 | 5,097,318 | 5,119,770 | 4,969,740 | 5,248,790 | 58,187,920 |
| 14 | ANR Refunds | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 15 | Canadian Purchases - Great Lakes | 1,958,075 | 2,027,689 | 1,849,680 | 2,033,102 | 1,901,720 | 1,817,475 | 1,909,868 | 2,497,703 | 2,546,717 | 2,562,839 | 2,313,948 | 2,602,838 | 26,021,654 |
| 16 | Panhandle Eastern | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 17 | Panhandle Refunds | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 18 | Spot/Term Purchases | 22,998,132 | 25,516,196 | 23,091,074 | 23,385,266 | 24,751,265 | 26,121,758 | 18,863,206 | 22,387,171 | 21,093,750 | 23,698,083 | 18,359,424 | 30,574,661 | 280,839,986 |
| 19 | Cover Standard Purchase Obligation | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 20 | Other Purchased Gas Expenses | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 21 | Exchange Gas | 4,963,653 | (4,101,483) | 690,210 | 1,687,662 | (347,196) | (280,922) | (99,744) | 145,649 | (2,097,594) | (318,695) | 1,803,856 | (777,204) | 1,268,192 |
| 22 | Reverse BTU Gain/(Loss) | 69 | 1,810 | (251) | (1,528) | (929) | 1,103 | (1,451) | 1,539 | - | - | - | - | 362 |
| 23 | Exchange Gas - Adjusted | 4,963,584 | (4,103,293) | 690,461 | 1,689,190 | (346,267) | (282,025) | (98,293) | 144,110 | (2,097,594) | (318,695) | 1,803,856 | (777,204) | 1,267,830 |
| 24 | Gain/(Loss) from BTU Estimates | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 25 | Total Purchased | $ 34,323,533 | $ 28,356,448 | $ 31,426,781 | $ 31,226,547 | $ 31,283,490 | $ 32,536,951 | $ 25,582,950 | $ 30,228,312 | $ 26,807,306 | $ 31,246,834 | $ 27,588,011 | $ 37,862,985 | $ 368,470,148 |
| | Sales by Revenue Class | | | | | | | | | | | | | |
| 26 | Residential | 91,313 | 63,302 | 24,964 | 28,607 | 26,260 | 37,364 | 79,550 | 100,536 | 154,198 | 178,248 | 189,518 | 123,207 | 1,097,067 |
| 27 | Residential Heating | 8,851,447 | 5,144,987 | 2,118,253 | 1,257,930 | 1,559,673 | 2,621,077 | 7,302,018 | 9,213,458 | 15,258,200 | 17,715,088 | 18,721,099 | 11,436,082 | 101,199,312 |
| 28 | Commercial | 97,751 | 66,859 | 34,652 | 46,549 | 54,979 | 50,689 | 97,454 | 114,451 | 181,790 | 193,294 | 218,270 | 158,483 | 1,315,221 |
| 29 | Commercial Heating | 1,943,983 | 608,046 | 502,346 | 379,936 | 480,420 | 598,786 | 1,375,898 | 2,014,812 | 3,780,268 | 4,436,865 | 4,740,979 | 2,909,163 | 23,771,502 |
| 30 | Industrial | 42,037 | 48,091 | 9,108 | 17,567 | 16,228 | 9,713 | 40,038 | 57,696 | 54,294 | 109,920 | 97,018 | 65,212 | 566,922 |
| 31 | Subtotal | 11,026,531 | 5,931,285 | 2,689,323 | 1,730,589 | 2,137,560 | 3,317,629 | 8,894,958 | 11,500,953 | 19,428,750 | 22,633,415 | 23,966,884 | 14,692,147 | 127,950,024 |
| 32 | Other | - | - | - | 70,490 | - | - | - | - | - | - | - | - | 70,490 |
| 33 | Total Sales (Unbilled) | 11,026,531 | 5,931,285 | 2,689,323 | 1,801,079 | 2,137,560 | 3,317,629 | 8,894,958 | 11,500,953 | 19,428,750 | 22,633,415 | 23,966,884 | 14,692,147 | 128,020,514 |

**Michigan Public Service Commission**
**DTE Gas Company**
**April 2020 through March 2021 GCR Reconciliation**
**Supplemental Data**

Case No.: U-20544
Exhibit: A-16
Witness: G. LoRe


| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | | 2020 | | | | | | | | | 2021 | | | |
| No. | Description | April | May | June | July | August | September | October | November | December | January | February | March | Year to Date |
| | Sales by Rate Class | | | | | | | | | | | | | |
| 1 | Rate GS-1 | 2,021,724 | 701,159 | 542,343 | 429,693 | 525,886 | 635,341 | 1,441,486 | 2,157,166 | 3,945,320 | 4,640,877 | 4,960,648 | 3,035,066 | 25,036,709 |
| 2 | Rate A | 8,545,442 | 5,135,962 | 2,083,553 | 1,198,093 | 1,511,074 | 2,573,450 | 7,123,454 | 9,037,338 | 14,970,846 | 17,378,760 | 18,386,269 | 11,204,714 | 99,148,955 |
| 3 | Rate 2A | 397,311 | 72,319 | 59,665 | 88,444 | 74,858 | 84,992 | 258,114 | 276,656 | 441,552 | 514,568 | 524,296 | 354,549 | 3,147,324 |
| 4 | Rate AS | 7 | 8 | - | - | - | - | - | - | - | 9 | 52 | 25 | 101 |
| 5 | Rate GS-2 | 16,971 | 11,116 | 3,235 | 13,036 | 23,409 | 19,980 | 52,965 | 1,564 | 36,672 | 54,862 | 46,782 | 42,596 | 323,188 |
| 6 | Rate S | 45,077 | 10,721 | 528 | 1,323 | 2,333 | 3,867 | 18,939 | 28,228 | 34,360 | 44,340 | 48,836 | 55,197 | 293,749 |
| 7 | Other | - | - | - | 70,490 | - | - | - | - | - | - | - | - | 70,490 |
| 8 | Total Sales (Unbilled) | 11,026,532 | 5,931,285 | 2,689,324 | 1,801,079 | 2,137,560 | 3,317,630 | 8,894,958 | 11,500,952 | 19,428,750 | 22,633,416 | 23,966,883 | 14,692,147 | 128,020,516 |
| | Number of Customers | | | | | | | | | | | | | |
| 9 | Residential | 17,482 | 17,502 | 17,500 | 17,553 | 17,528 | 17,559 | 17,585 | 17,628 | 17,712 | 17,714 | 17,757 | 17,763 | |
| 10 | Residential Heating | 1,064,423 | 1,067,598 | 1,069,877 | 1,071,363 | 1,073,438 | 1,075,870 | 1,079,469 | 1,082,397 | 1,084,741 | 1,086,033 | 1,087,400 | 1,088,522 | |
| 11 | Commercial | 3,681 | 3,689 | 3,694 | 3,694 | 3,690 | 3,673 | 3,685 | 3,680 | 3,683 | 3,665 | 3,664 | 3,680 | |
| 12 | Commercial Heating | 68,378 | 68,389 | 68,285 | 68,180 | 68,152 | 68,277 | 68,673 | 68,830 | 68,988 | 69,194 | 69,386 | 69,611 | |
| 13 | Industrial | 309 | 310 | 311 | 314 | 314 | 316 | 318 | 317 | 313 | 311 | 308 | 308 | |
| 14 | Other | - | - | - | - | - | - | - | - | - | - | - | - | |
| 15 | Total Customers | 1,154,273 | 1,157,488 | 1,159,667 | 1,161,104 | 1,163,122 | 1,165,695 | 1,169,730 | 1,172,852 | 1,175,437 | 1,176,917 | 1,178,515 | 1,179,884 | |
| | Total Revenue | | | | | | | | | | | | | |
| 16 | Gross Sales Billed | $ 81,708,383 | $ 64,054,198 | $ 36,838,936 | $ 26,573,846 | $ 25,461,077 | $ 27,624,116 | $ 42,157,005 | $ 69,710,291 | $ 121,685,986 | $ 139,393,460 | $ 143,321,111 | $ 144,061,193 | $ 922,589,602 |
| 17 | Unbilled Adjustment | (9,172,486) | (17,900,639) | (8,917,253) | (3,702,919) | (602,008) | 3,997,776 | 26,857,907 | 15,061,836 | 9,760,809 | 9,463,166 | 12,694,086 | (42,934,361) | (5,394,086) |
| 18 | Sales Revenue (Unbilled) | $ 72,535,897 | $ 46,153,559 | $ 27,921,683 | $ 22,870,927 | $ 24,859,069 | $ 31,621,892 | $ 69,014,912 | $ 84,772,127 | $ 131,446,795 | $ 148,856,626 | $ 156,015,197 | $ 101,126,832 | $ 917,195,516 |
| 19 | Less Revenue For Sales With No GCR Factor: | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 20 | Total Revenue | $ 72,535,897 | $ 46,153,559 | $ 27,921,683 | $ 22,870,927 | $ 24,859,069 | $ 31,621,892 | $ 69,014,912 | $ 84,772,127 | $ 131,446,795 | $ 148,856,626 | $ 156,015,197 | $ 101,126,832 | $ 917,195,516 |

**Michigan Public Service Commission**
**DTE Gas Company**
**April 2020 through March 2021 GCR Reconciliation**
**Supplemental Data**

Case No.: U-20544
Exhibit: A-16
Witness: G. LoRe


| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | | 2020 | | | | | | | | | 2021 | | | |
| No. | Description | April | May | June | July | August | September | October | November | December | January | February | March | Year to Date |
| | Billed Sales by Rate Class | | | | | | | | | | | | | |
| 1 | Rate GS-1 | 2,484,969 | 1,624,287 | 777,809 | 515,831 | 456,823 | 553,189 | 838,580 | 1,716,912 | 3,416,317 | 4,207,668 | 4,520,937 | 4,479,282 | 25,592,604 |
| 2 | Rate A | 10,002,661 | 7,606,008 | 3,271,790 | 1,776,949 | 1,656,974 | 1,943,310 | 3,781,883 | 7,234,847 | 13,530,349 | 16,073,185 | 16,938,079 | 16,658,655 | 100,474,690 |
| 3 | Rate 2A | 328,151 | 246,274 | 147,147 | 99,457 | 65,737 | 70,491 | 165,141 | 235,796 | 406,022 | 475,323 | 479,945 | 459,206 | 3,178,690 |
| 4 | Rate AS | 7 | 8 | - | - | - | - | - | - | - | 9 | 52 | 25 | 101 |
| 5 | Rate GS-2 | 18,006 | 18,703 | 5,984 | 15,625 | 11,275 | 11,930 | 28,663 | 21,008 | 35,713 | 51,654 | 44,089 | 47,057 | 309,707 |
| 6 | Rate S | 46,046 | 19,745 | 4,612 | 2,185 | 2,260 | 3,991 | 9,441 | 20,728 | 29,996 | 40,379 | 51,397 | 63,322 | 294,102 |
| 7 | Other | - | - | - | 70,490 | - | - | - | - | - | - | - | - | 70,490 |
| 8 | Total Billed Sales | 12,879,840 | 9,515,025 | 4,207,342 | 2,480,537 | 2,193,069 | 2,582,911 | 4,823,708 | 9,229,291 | 17,418,397 | 20,848,218 | 22,034,499 | 21,707,547 | 129,920,384 |
| | Change in Unbilled Volume | | | | | | | | | | | | | |
| 9 | Rate GS-1 | (463,245) | (923,128) | (235,466) | (86,138) | 69,063 | 82,152 | 602,906 | 440,254 | 529,003 | 433,209 | 439,711 | (1,444,216) | |
| 10 | Rate A | (1,457,219) | (2,470,046) | (1,188,237) | (578,856) | (145,900) | 630,140 | 3,341,571 | 1,802,491 | 1,440,497 | 1,305,575 | 1,448,190 | (5,453,941) | |
| 11 | Rate 2A | 69,160 | (173,955) | (87,482) | (11,013) | 9,121 | 14,501 | 92,973 | 40,860 | 35,530 | 39,245 | 44,351 | (104,657) | |
| 12 | Rate AS | - | - | - | - | - | - | - | - | - | - | - | - | |
| 13 | Rate GS-2 | (1,035) | (7,587) | (2,749) | (2,589) | 12,134 | 8,050 | 24,302 | (19,444) | 959 | 3,208 | 2,693 | (4,461) | |
| 14 | Rate S | (969) | (9,024) | (4,084) | (862) | 73 | (124) | 9,498 | 7,500 | 4,364 | 3,961 | (2,561) | (8,125) | |
| 15 | Other | - | - | - | - | - | - | - | - | - | - | - | - | |
| 16 | Total Unbilled Volume Balance | (1,853,308) | (3,583,740) | (1,518,018) | (679,458) | (55,509) | 734,719 | 4,071,250 | 2,271,661 | 2,010,353 | 1,785,198 | 1,932,384 | (7,015,400) | |

**Michigan Public Service Commission**
**DTE Gas Company**
**April 2020 through March 2021 GCR Reconciliation**
**Supplemental Data**

Case No.: U-20544
Exhibit: A-16
Witness: G. LoRe


| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | | 2020 | | | | | | | | | 2021 | | | |
| No. | Description | April | May | June | July | August | September | October | November | December | January | February | March | Year to Date |
| | Billed GCR Revenues by Rate Class | | | | | | | | | | | | | |
| 1 | Rate GS-1 | $ 5,470,693 | $ 3,553,250 | $ 1,869,100 | $ 1,267,178 | $ 1,122,376 | $ 1,347,555 | $ 2,064,244 | $ 4,228,368 | $ 8,405,341 | $ 9,919,241 | $ 10,204,280 | $ 10,659,109 | $ 60,110,735 |
| 2 | Rate A | 22,014,442 | 16,700,826 | 7,825,988 | 4,304,157 | 3,990,722 | 4,685,982 | 9,259,823 | 17,759,550 | 33,246,411 | 37,834,259 | 38,165,283 | 37,387,516 | 233,174,959 |
| 3 | Rate 2A | 727,034 | 540,792 | 352,680 | 241,071 | 160,174 | 171,601 | 405,389 | 580,837 | 998,784 | 1,121,141 | 1,080,729 | 1,029,129 | 7,409,361 |
| 4 | Rate AS | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | Rate GS-2 | 39,613 | 41,146 | 14,600 | 37,992 | 27,400 | 28,991 | 70,203 | 51,680 | 87,854 | 122,643 | 99,268 | 105,176 | 726,566 |
| 6 | Other | | | | 235,013 | - | - | - | - | - | - | - | - | 235,013 |
| 7 | Rate S | 106,650 | 43,439 | 11,160 | 5,541 | 5,506 | 9,886 | 23,285 | 51,021 | 73,849 | 95,433 | 117,102 | 142,681 | 685,553 |
| 8 | Total Billed GCR Revenue | $ 28,358,432 | $ 20,879,453 | $ 10,073,528 | $ 6,090,952 | $ 5,306,178 | $ 6,244,015 | $ 11,822,944 | $ 22,671,456 | $ 42,812,239 | $ 49,092,717 | $ 49,666,662 | $ 49,323,611 | $ 302,342,187 |
| | Unbilled GCR Revenues by Rate Class | | | | | | | | | | | | | |
| 9 | Rate GS-1 | $ (1,019,139) | $ (1,884,739) | $ (572,184) | $ (209,315) | $ 167,824 | $ 213,579 | $ 1,483,150 | $ 1,083,024 | $ 1,077,259 | $ 771,002 | $ 989,350 | $ (3,249,485) | $ (1,149,674) |
| 10 | Rate A | (3,205,883) | (4,772,318) | (2,887,416) | (1,406,620) | (354,537) | 1,579,073 | 8,220,266 | 4,434,127 | 2,643,930 | 2,119,643 | 3,258,428 | (12,271,368) | (2,642,675) |
| 11 | Rate 2A | 152,152 | (351,027) | (212,580) | (26,762) | 22,165 | 37,122 | 228,714 | 100,514 | 61,862 | 65,080 | 99,790 | (235,479) | (58,449) |
| 12 | Rate AS | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | Rate GS-2 | (2,278) | (12,453) | (6,680) | (6,292) | 29,486 | 20,560 | 59,783 | (47,832) | (1,941) | 3,310 | 6,059 | (10,037) | 31,685 |
| 14 | Rate S | (2,132) | (17,761) | (9,924) | (2,095) | 178 | (179) | 23,365 | 18,450 | 7,935 | 6,367 | (5,762) | (18,282) | 160 |
| 15 | Total GCR Revenue | $ (4,077,280) | $ (7,038,298) | $ (3,688,784) | $ (1,651,084) | $ (134,884) | $ 1,850,155 | $ 10,015,278 | $ 5,588,283 | $ 3,789,045 | $ 2,965,402 | $ 4,347,865 | $ (15,784,651) | $ (3,818,953) |
| | Revenues by Rate Class (Unbilled Basis) | | | | | | | | | | | | | |
| 16 | Rate GS-1 | $ 4,451,554 | $ 1,668,511 | $ 1,296,916 | $ 1,057,863 | $ 1,290,200 | $ 1,561,134 | $ 3,547,394 | $ 5,311,392 | $ 9,482,600 | $ 10,690,243 | $ 11,193,630 | $ 7,409,624 | $ 58,961,061 |
| 17 | Rate A | 18,808,559 | 11,928,508 | 4,938,572 | 2,897,537 | 3,636,185 | 6,265,055 | 17,480,089 | 22,193,677 | 35,890,341 | 39,953,902 | 41,423,711 | 25,116,148 | 230,532,284 |
| 18 | Rate 2A | 879,186 | 189,765 | 140,100 | 214,309 | 182,339 | 208,723 | 634,103 | 681,351 | 1,060,646 | 1,186,221 | 1,180,519 | 793,650 | 7,350,912 |
| 19 | Rate AS | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 20 | Rate GS-2 | 37,335 | 28,693 | 7,920 | 31,700 | 56,886 | 49,551 | 129,986 | 3,848 | 85,913 | 125,953 | 105,327 | 95,139 | 758,251 |
| 21 | Other | | | | 235,013 | | | | | | | | | 235,013 |
| 22 | Rate S | 104,518 | 25,678 | 1,236 | 3,446 | 5,684 | 9,707 | 46,650 | 69,471 | 81,784 | 101,800 | 111,340 | 124,399 | 685,713 |
| 23 | Total GCR Revenue | $ 24,281,152 | $ 13,841,155 | $ 6,384,744 | $ 4,439,868 | $ 5,171,294 | $ 8,094,170 | $ 21,838,222 | $ 28,259,739 | $ 46,601,284 | $ 52,058,119 | $ 54,014,527 | $ 33,538,960 | $ 298,523,234 |
| 24 | Average Short-Term Borrowing Rate | 1.9600% | 1.4100% | 1.1858% | 1.1527% | 1.1320% | 1.1564% | 1.1466% | 0.1284% | 0.1476% | 0.1353% | 0.1400% | 0.1396% | |

**DTE GAS COMPANY**
**STORAGE COST CALCULATION**
**April 2020 through March 2021 GCR Reconciliation**

Case No.: U-20544
Exhibit: A-17
Witness: G. LoRe
Page: 1 of 1

| Line | Month | Net Storage Volume | 2020 LIFO Rate | Net Storage Cost |
|---|---|---|---|---|
| | | (Col. a) | (Col. b) | (Col. c) |
| 1 | April 2020 | (3,160,020) | $2.8161 | $ (8,898,932) |
| 2 | May | (4,628,714) | $2.8161 | $ (13,034,921) |
| 3 | June | (9,163,152) | $2.8161 | $ (25,804,352) |
| 4 | July | (10,760,103) | $2.8161 | $ (30,301,526) |
| 5 | August | (9,954,187) | $2.8161 | $ (28,031,986) |
| 6 | September | (8,773,248) | $2.8161 | $ (24,706,344) |
| 7 | October | (908,647) | $2.8161 | $ (2,558,841) |
| 8 | November | 3,515,054 | $2.8161 | $ 9,898,744 |
| 9 | December | 11,621,966 | $2.8161 | $ 32,728,618 |
| 10 | Decrement | 95,302 | | $ 316,098 |
| 11 | Total 2020 | **(32,115,749)** | | **$ (90,393,443)** |

| Line | Month | Volume | LIFO Rate | Cost |
|---|---|---|---|---|
| | | (Col. a) | (Col. b) | (Col. c) |
| 12 | Decrement 2020 - 2018 LIFO Layer | 95,302 | $3.3168 | $ 316,098 |
| | Total Decrement | **95,302** | | **$ 316,098** |

| Line | Month | Net Storage Volume | Estimated 2021 LIFO Rate | Net Storage Cost |
|---|---|---|---|---|
| | | (Col. a) | (Col. b) | (Col. c) |
| 13 | January 2021 | 13,324,898 | $3.0500 | $ 40,640,939 |
| 14 | February | 15,252,318 | $3.0500 | $ 46,519,570 |
| 15 | March | 3,326,724 | $3.0500 | $ 10,146,508 |
| 16 | Total 2021 | **31,903,940** | | **$ 97,307,017** |
| 17 | **Total 2020 - 2021 GCR Period** | **(211,809)** | | **$ 6,913,574** |

| Line | **April** | | |
|---|---|---|---|
| | **Prior Period Storage Adjustment (Jan - Mar 2020)** | | |
| 18 | Jan - Mar 2020 Volumes (To) / From | | **32,211,051** |
| 19 | Final LIFO Rate | $ 2.8161 | |
| 20 | Prior Period LIFO Estimate | $ 2.8500 | |
| 21 | LIFO Increase / (Decrease) | ($0.0339) | |
| 22 | Adjustment | | **$ (1,091,955)** |

**DTE GAS COMPANY**
**GCR CUSTOMERS INTEREST CALCULATION**
**GCR AND RESERVATION CHARGE**
**April 2020 through March 2021 GCR Reconciliation**

Case No.: U-20544
Exhibit: A-18
Witness: G. LoRe


| Line | Month | Beginning Balance Over/(Under) Recovery | Current Month Over/(Under) Recovery | Current Month Average | Current Month Base For Interest Accrual | Interest Rate | Interest (Revenue)/ Expense |
|---|---|---|---|---|---|---|---|
| | | Col. 1 | Col. 2 | Col. 3 (Col. 2 * 50%) | Col. 4 (Col. 1 + Col. 3) | Col. 5 | Col. 6 (Col. 4 * Col. 5 * days in month / 365) |
| 1 | 3/31/20 Balance | | $ 953,138 | | | | |
| 2 | April | $ 953,138 | 3,108,812 | $ 1,554,406 | $ 2,507,544 | 10.000% | $ 20,610 |
| 3 | May | 4,061,950 | 3,596,991 | 1,798,495 | 5,860,445 | 10.000% | 49,774 |
| 4 | June | 7,658,941 | 2,596,114 | 1,298,057 | 8,956,998 | 10.000% | 73,619 |
| 5 | July | 10,255,054 | 5,377,438 | 2,688,719 | 12,943,774 | 10.000% | 109,933 |
| 6 | August | 15,632,493 | 4,167,736 | 2,083,868 | 17,716,361 | 10.000% | 150,468 |
| 7 | September | 19,800,228 | 2,483,021 | 1,241,510 | 21,041,739 | 10.000% | 172,946 |
| 8 | October | 22,283,249 | 3,150,381 | 1,575,191 | 23,858,440 | 9.900% | 200,607 |
| 9 | November | 25,433,631 | (2,699,679) | (1,349,840) | 24,083,791 | 9.900% | 195,969 |
| 10 | December | 22,733,952 | (3,700,633) | (1,850,316) | 20,883,635 | 9.900% | 175,594 |
| 11 | January 2021 | 19,033,319 | (8,070,349) | (4,035,174) | 14,998,145 | 9.900% | 126,108 |
| 12 | February | 10,962,970 | (10,574,221) | (5,287,111) | 5,675,860 | 9.900% | 43,105 |
| 13 | March | 388,749 | (7,128,131) | (3,564,065) | (3,175,316) | 0.140% | (376) |
| 14 | TOTAL | | **$ (6,739,381)** | | | | ***$ 1,318,357*** |
| 15 | TOTAL OVER (UNDER) RECOVERY PLUS INTEREST | | | **($5,421,024)** | | | |

Notes: If the beginning balance for any month plus the current month average balance is positive, the interest rate utilized in Column 5 is the allowed ROE.
Allowed ROE is 10.0% (April 2019 - September 2020 per U-18999) and 9.9% (October 2020 - March 2021 per U-20642)
If the beginning balance plus the current month average balance is negative, the interest rate is the average short term borrowing rate for the current month.
The beginning balance is the ending balance from U-20236.

**DTE GAS COMPANY**
**Reservation Charge Reconciliation**
**For GCC Customers Only**
**April 2020 through March 2021 GCR Reconciliation**

Case No.: U-20544
Exhibit: A-19
Witness: G. LoRe


| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Line** | | **2020** | | | | | | | | | **2021** | | | **12 Months** |
| **No.** | **Description** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** | **January** | **February** | **March** | **Mar 2021** |
| 1 | GCC Reservation Charge Volume | | | | | | | | | | | | | |
| 3 | GCC Rate Schedule Sales (Billed) | 2,448,456 | 1,758,386 | 766,548 | 481,618 | 448,952 | 514,317 | 913,330 | 1,708,621 | 2,981,453 | 3,551,656 | 3,842,439 | 3,689,749 | 23,105,523 |
| 4 | Unbilled - Current Month | 1,388,109 | 768,799 | 367,776 | 310,746 | 317,660 | 452,817 | 1,196,860 | 1,679,042 | 1,871,731 | 2,171,375 | 2,389,121 | 1,406,724 | 14,320,760 |
| 5 | - Prior Month | (1,992,350) | (1,388,109) | (768,799) | (367,776) | (310,746) | (317,660) | (452,817) | (1,196,860) | (1,679,042) | (1,871,731) | (2,171,375) | (2,389,121) | (14,906,386) |
| 6 | Total GCC Sales (Unbilled) | 1,844,215 | 1,139,076 | 365,525 | 424,588 | 455,866 | 649,474 | 1,657,373 | 2,190,803 | 3,174,142 | 3,851,300 | 4,060,185 | 2,707,352 | 22,519,897 |
| 7 | Billed Reservation Charge | $0.24 | $0.24 | $0.28 | $0.28 | $0.28 | $0.28 | $0.28 | $0.28 | $0.28 | $0.28 | $0.28 | $0.28 | |
| 8 | Billed Resv Surch | $588,580 | $421,992 | $210,980 | $133,365 | $125,667 | $144,259 | $255,647 | $477,686 | $833,944 | $994,546 | $1,075,968 | $1,032,964 | $6,295,597 |
| 9 | Unbilled - Current Month | 333,147 | 215,262 | 102,977 | 87,010 | 88,945 | 126,789 | 335,122 | 470,130 | 524,084 | 607,986 | 668,954 | 393,882 | 3,954,288 |
| 10 | - Prior Month | (478,163) | (333,147) | (215,262) | (102,977) | (87,010) | (88,945) | (126,789) | (335,122) | (470,130) | (524,084) | (607,986) | (668,954) | (4,038,569) |
| 11 | Total GCC Reservation Charge (Unbilled) | 443,564 | 304,107 | 98,695 | 117,398 | 127,602 | 182,103 | 463,980 | 612,694 | 887,898 | 1,078,448 | 1,136,936 | 757,892 | 6,211,316 |
| 12 | Prior Period Over (Under) Collection | 1,801,558 | | | | | | | | | | | | 1,801,558 |
| 13 | Pipeline Reservation Cost (net of credits) | 441,381 | 501,114 | 579,451 | 414,298 | 497,661 | 491,438 | 502,737 | 525,174 | 533,769 | 536,120 | 520,409 | 549,630 | 6,093,182 |
| 14 | Over (Under) Recovery | $ 1,803,741 | $ (197,007) | $ (480,756) | $ (296,901) | $ (370,059) | $ (309,335) | $ (38,758) | $ 87,520 | $ 354,130 | $ 542,328 | $ 616,526 | $ 208,261 | $ 1,919,692 |

**DTE GAS COMPANY**
**GCC RESERVATION CHARGE (RC) INTEREST CALCULATION**
**April 2020 through March 2021 GCR Reconciliation**

Case No.: U-20544
Exhibit: A-19
Witness: G. LoRe


| Line | Month | Beginning Balance Over/(Under) Recovery | Current Month Over/(Under) Recovery | Current Month Average | Current Month Base For Interest Accrual | Interest Rate | Interest (Revenue)/ Expense |
|---|---|---|---|---|---|---|---|
| | | Col. 1 | Col. 2 | Col. 3 (Col. 2 * 50%) | Col. 4 (Col. 1 + Col. 3) | Col. 5 | Col. 6 days in month / 365) |
| 1 | 3/31/20 Balance | | $ 1,801,558 | | | | |
| 2 | April | $ 1,801,558 | 2,183 | $ 1,092 | $ 1,802,650 | 10.000% | $ 14,816 |
| 3 | May | 1,803,741 | (197,007) | (98,503) | 1,705,238 | 10.000% | 14,483 |
| 4 | June | 1,606,734 | (480,756) | (240,378) | 1,366,356 | 10.000% | 11,230 |
| 5 | July | 1,125,978 | (296,901) | (148,450) | 977,528 | 10.000% | 8,302 |
| 6 | August | 829,077 | (370,059) | (185,029) | 644,048 | 10.000% | 5,470 |
| 7 | September | 459,019 | (309,335) | (154,668) | 304,351 | 10.000% | 2,502 |
| 8 | October | 149,683 | (38,758) | (19,379) | 130,305 | 9.900% | 1,096 |
| 9 | November | 110,926 | 87,520 | 43,760 | 154,686 | 9.900% | 1,259 |
| 10 | December | 198,446 | 354,130 | 177,065 | 375,511 | 9.900% | 3,157 |
| 11 | January 2021 | 552,576 | 542,328 | 271,164 | 823,740 | 9.900% | 6,926 |
| 12 | February | 1,094,904 | 616,526 | 308,263 | 1,403,167 | 9.900% | 10,656 |
| 13 | March | 1,711,430 | 208,261 | 104,131 | 1,815,561 | 9.900% | 15,266 |
| 14 | TOTAL | | **$ 1,919,692** | | | | ***$ 95,163*** |
| 15 | TOTAL OVER (UNDER) RECOVERY PLUS INTEREST | | | **$2,014,855** | | | |

Notes: If the beginning balance for any month plus the current month average balance is positive, the interest rate utilized in Column 5 is the allowed ROE.
Allowed ROE is 10.0% (April 2019 - September 2020 per U-18999) and 9.9% (October 2020 - March 2021 per U-20642)
If the beginning balance plus the current month average balance is negative, the interest rate is the average short term borrowing rate for the current month.
The beginning balance is the ending balance from U-20236

**DTE GAS COMPANY**
**GCC RESERVATION CHARGE (RC) ADJUSTMENT CALCULATION**
**April 2020 through March 2021**

Case No.: U-20544
Exhibit: A-19
Witness: G. LoRe


| Line No. | (a) | (b) | (c) | (d) | (e) |
|---|---|---|---|---|---|
| 1 | **Gas Year April 2020 thru March 2021** | | **GCR** | **GCC** | **Total** |
| 2 | Total Sales (MCF)-Unbilled volumes | | 128,020,516 | 22,519,897 | 150,540,413 |
| 3 | Actual Demand $ recovered via SOLR in 2019-2020 | | $ 53,411,499 | $ 6,211,316 | |
| 4 | Net GCR Revenue | | $ 298,523,234 | | |
| 5 | GCC Prior Period Over (Under) Collection | | | $ 1,801,558 | |
| 6 | **Total Dollars charged April 2020 - March 2021** | | **$ 351,934,733** | **$ 8,012,874** | |
| 7 | Pipeline Reservation Cost (net of credits) | | | | $ 58,187,920 |
| 8 | Discounted Expense Calculation | | $ 52,094,738 | $ 6,093,182 | $ 58,187,920 |
| 9 | Discounted allocation factor of Reservation Cost Volumes | | 89.53% | 10.47% | 100.00% |
| 10 | GCR Net Recoverable Cost (excluding Prior Year Over/(Under) Recovery | | $ 357,720,976 | | |
| 11 | GCR Prior Year Over/(Under) Recovery | | 953,138 | | |
| 12 | **FINAL** Over/(Under) Recovery | | $ (6,739,381) | $ 1,919,692 | |

**DTE GAS COMPANY**

**Reservation Charge Reconciliation (True Up)**
**For GCC Customers Only**
**April 2020 through March 2021**

Case No.: U-20544
Exhibit: A-19
Witness: G. LoRe


| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line No. | Monthly | | 2020 | | | | | | | | | 2021 | | | |
| | | | April | May | June | July | August | September | October | November | December | January | February | March | Total |
| 1 | GCC Sales (Unbilled) | | $ 1,844,215 | $ 1,139,076 | $ 365,525 | $ 424,588 | $ 455,866 | $ 649,474 | $ 1,657,373 | $ 2,190,803 | $ 3,174,142 | $ 3,851,300 | $ 4,060,185 | $ 2,707,352 | $22,519,897 |
| 2 | GCR Sales (Unbilled) | | 11,026,532 | 5,931,285 | 2,689,324 | 1,801,079 | 2,137,560 | 3,317,630 | 8,894,958 | 11,500,952 | 19,428,750 | 22,633,416 | 23,966,883 | 14,692,147 | 128,020,516 |
| 3 | Total | | 12,870,747 | 7,070,361 | 3,054,849 | 2,225,667 | 2,593,426 | 3,967,104 | 10,552,331 | 13,691,755 | 22,602,892 | 26,484,716 | 28,027,068 | 17,399,499 | 150,540,413 |
| 4 | Pipeline Reservation Cost (net of credits) | | 4,215,045 | 4,785,478 | 5,533,573 | 3,956,414 | 4,752,500 | 4,693,072 | 4,800,979 | 5,015,241 | 5,097,318 | 5,119,770 | 4,969,740 | 5,248,790 | 58,187,920 |
| 5 | Pipeline Reservation Cost w/new SOLR GCC | | 441,381 | 501,114 | 579,451 | 414,298 | 497,661 | 491,438 | 502,737 | 525,174 | 533,769 | 536,120 | 520,409 | 549,630 | 6,093,182 |
| 6 | Pipeline Reservation Cost w/new SOLR GCR | | 3,773,664 | 4,284,364 | 4,954,122 | 3,542,116 | 4,254,839 | 4,201,634 | 4,298,242 | 4,490,067 | 4,563,549 | 4,583,650 | 4,449,331 | 4,699,160 | 52,094,738 |
| 7 | | | 4,215,045 | 4,785,478 | 5,533,573 | 3,956,414 | 4,752,500 | 4,693,072 | 4,800,979 | 5,015,241 | 5,097,318 | 5,119,770 | 4,969,740 | 5,248,790 | 58,187,920 |
| 8 | Actual Demand $ recovered via RC | | 443,564 | 304,107 | 98,695 | 117,398 | 127,602 | 182,103 | 463,980 | 612,694 | 887,898 | 1,078,448 | 1,136,936 | 757,892 | 6,211,316 |
| | | Carryover | | | | | | | | | | | | | |
| 9 | Over (Under) Recovery | $ 1,801,558 | $ 2,183 | $ (197,007) | $ (480,756) | $ (296,901) | $ (370,059) | $ (309,335) | $ (38,758) | $ 87,520 | $ 354,130 | $ 542,328 | $ 616,526 | $ 208,261 | $ 1,919,692 |

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of | ) | |
| **DTE GAS COMPANY** for reconciliation of | ) | |
| its gas cost recovery plan (Case No. U-20543) | ) | Case No. U-20544 |
| for the 12 months ended March 31, 2021. | ) | |
| | ) | |

QUALIFICATIONS

AND

DIRECT TESTIMONY

OF

MATTHEW J. DECOURCEY

Line No.

**Q1. Please state your name and business address.**

A1. My name is Matthew DeCourcey (he/him/his). My business address is 200 State Street, Boston, Massachusetts 02109.

**Q2. On whose behalf are you testifying?**

A2. I am testifying on behalf of DTE Gas Company (Company or DTE Gas).

**Q3. By whom are you employed and in what capacity?**

A3. I am a Managing Director in the Power & Utilities practice at FTI Consulting, Inc. (FTI).

**Q4. Please describe FTI and its Power & Utilities practice.**

A4. FTI is a worldwide consulting firm dedicated to helping organizations manage change, mitigate risk, and resolve disputes. Our Power & Utilities practice brings these services to firms in regulated and competitive energy industries. The services we provide our utility clients include expert testimony, regulatory advice, support for strategic decision-making, and advice regarding investments and capital allocation. Our team is comprised of former utility executives, regulators, investors, and financial analysts that combine for hundreds of years of experience in the regulated energy space.

**Q5. Please summarize your educational background.**

A5. I hold a Bachelor of Science in Political Science from the University of Massachusetts at Boston and a Master of Business Administration from the University of Massachusetts at Amherst.

**Q6. Please describe your work experience.**

A6. I have been with FTI since 2018. Previously, I consulted with Concentric Energy Advisors, Inc. in Marlborough, MA, and with Levitan & Associates in Boston, MA. Much of my practice is centered on the analysis of natural gas and power markets. I am frequently called upon by developers to help understand the economics of new infrastructure and to help convey a project's value proposition to regulators and investors. Often, this involves the deployment of the tools and methods I used to conduct the analysis I describe later in my testimony. I also often consult on issues related to the economic and reliability implications of changes to the configuration of the gas-electric interface, disputes and damages, price forecasting to support strategy or risk management, and on complex commercial or market-related matters that emerge within the context of utility ratemaking. My resume is attached as Exhibit A-29 and provides additional detail about my experience, including previous consulting assignments.

**Q7. Have you previously testified before the Commission?**

A7. Yes. I filed testimony on behalf of DTE Gas in Case No. U-20236; and I filed testimony on behalf of DTE Electric Company (DTE Electric) in Case No. U-20528. Prior to that, I testified before the New Hampshire Public Utilities Commission, the District of Columbia Public Service Commission, and the Federal Energy Regulatory Commission. I have also been retained as an expert on natural gas and competitive markets for civil disputes, administrative proceedings, and arbitrations

Line No.

**Q8. What is the purpose of your testimony in this proceeding?**

A8. The Company has asked me to estimate the impacts to DTE Gas customers specifically, and customers in Michigan generally, from the development of the NEXUS Gas Transmission pipeline (NEXUS). To do so, I developed long-run simulations of relevant gas markets, including the Upper Midwest and supply regions, from whose results I estimated how NEXUS is expected to affect the delivered cost of gas that will be paid by consumers in Michigan. My analysis and results are described in detail in Exhibit A-30, FTI Report "NEXUS Pipeline Impacts Analysis." The purpose of my testimony is to introduce and summarize that report.

**Q9. Are you sponsoring any exhibits in this proceeding?**

A9. I am sponsoring the following exhibit(s):

| Exhibit | Description |
|---|---|
| A-29 | M. J. DeCourcey Curriculum Vitae |
| A-30 | FTI Report "NEXUS Pipeline Impacts Analysis" |

**Q10. Were these exhibits prepared by you or under your direction?**

A10. Yes.

**Q11. Can you please briefly summarize the primary conclusions you reached based on your analysis?**

A11. Yes. My testimony describes an analysis I conducted that shows that NEXUS will decrease natural gas prices in Michigan significantly. Decreases in prices create savings for all the gas consumers in the state, including customers of DTE Gas, DTE Electric, and customers of other utilities. Those savings are greater than the costs of the contract that DTE Gas executed for long-term firm transportation entitlements on NEXUS. My primary conclusion, therefore, is that the Company's execution of its contracts for NEXUS supply have been very beneficial to its customers. Later in my testimony, I also describe additional reliability and environmental benefits that create additional value for DTE Gas customers and all Michigan consumers.

**Q12. How large are the projected savings?**

A12. For the period 2022 to 2038, the total savings to Michigan's gas customers is approximately $1 billion, which includes $199 million in savings to customers of DTE Gas. As I explain later in my testimony, I also estimated savings under an alternative scenario in which demand is assumed to increase and the savings are even greater.

**Q13. How is the rest of your testimony organized?**

A13. *First*, I briefly describe the NEXUS system and the entitlements held by the Company. *Second*, I explain the simulations I developed to forecast delivered prices with and without NEXUS in service. *Third,* I explain how I used those forecasts to estimate the savings to Michigan customers attributable to NEXUS and summarize my results. *Fourth*, I explain some of the similarities and differences among the analyses I conducted and those previously commissioned by DTE Gas. *Fifth*, I identify additional benefits, other than cost savings, that NEXUS creates for customers. Finally, *sixth*, I discuss my conclusions.

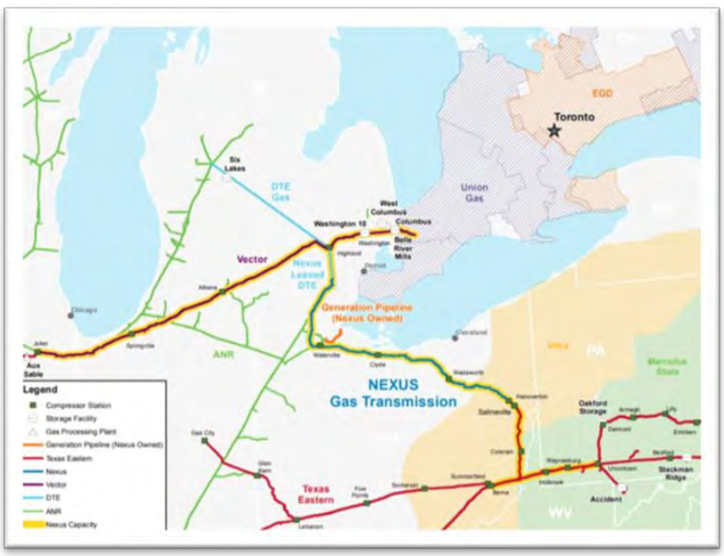
Line
No.

## The NEXUS System

**Q14. Can you describe the NEXUS pipeline?**

A14. Yes. NEXUS is an approximately 250-mile natural gas transmission pipeline designed to transport up to 1.4 billion cubic feet per day (Bcf/d) of natural gas from receipt points in eastern Ohio to existing pipeline system interconnects in southeastern Michigan. In Southeast Ohio, NEXUS can receive gas from gas suppliers operating in the Marcellus and Utica Shale plays and from interconnections with the Texas Eastern Transmission (TETCO) and Tennessee Gas Pipeline (TGP) systems. In Michigan, NEXUS provides deliverability to interconnects with the DTE Gas transmission system at its interconnect in Ypsilanti, Michigan, and to the Vector Pipeline (Vector).

**Figure 1. NEXUS Map**[1]




**Q15. What is the current status of NEXUS?**

A15. It is operational. In October 2018, the system was placed into service allowing flows north from Kensington, Ohio into Michigan. Additional capacity to

[1] Source: DTE Midstream

Line No.

Clarington, Ohio, was developed as a separate, incremental project, the Texas Eastern Appalachian Lease (TEAL), which is a 950,000 dekatherm per day (Dth/d) pipeline from Clarington to Kensington. TEAL is also in service.

**Q16. What entitlements does DTE Gas hold on NEXUS?**

A16. DTE Gas holds a contract entitling it to receive gas at Kensington and deliver it to Ypsilanti until 2033. The contract's Maximum Daily Quantity (MDQ) is currently 37,500 Dth/d and will increase to 75,000 Dth/d in 2022. Through 2022, the Company can receive 37,500 Dth/d at Clarington. Additional detail regarding the Company's entitlements is included in Exhibit A-30.

**Q17. What rates does DTE Gas pay under these agreements?**

A17. The transportation rates are $0.695/Dth from Kensington to NEXUS-Ypsilanti and $0.15/Dth from Clarington to Kensington. There is an additional fuel charge that is currently 1.26%.

## Simulation Analyses

**Q18. Can you summarize this simulation analyses section of your testimony?**

A18. In this section, I describe simulation analyses I developed whose primary purpose was to forecast gas prices in Michigan, Ohio, and Ontario. Below, I explain how I developed a set of price forecasts I refer to as the *Base Case* and which reflects expected market conditions. I then compared those results to a separate set of forecasts I prepared, the *No NEXUS Case*, from which I removed NEXUS but held all other inputs constant. This comparison is intended to estimate the impact NEXUS will have on delivered prices in and around Michigan.

Line No.

**Q19. What impact did you find?**

A19. Prices at the MichCon CityGate and Dawn (Ontario) were lower in the *Base Case*, which indicates that NEXUS reduces prices in and around Michigan.

**Q20. Why does NEXUS reduce prices in and around Michigan?**

A20. Gas flowing on NEXUS includes production from shale gas deposits in Ohio, Pennsylvania, and West Virginia, where gas is abundant and where prices are among the lowest in North America. Historically, prices in and around Michigan have been higher than in Appalachia, sometimes considerably so. Because of its cost advantage, Appalachian gas flowing on NEXUS for delivery to Michigan displaces more expensive supplies, reducing prices.

**Q21. Can you explain how you estimated the magnitude of the price reduction?**

A21. I conducted simulations of the gas market using GPCM, an industry-standard software tool designed for that purpose. Specifically, I developed two simulations. First, the *Base Case* is a "business as usual" outlook insofar as it reflects current expectations regarding supply, demand, pipeline infrastructure, and other factors, including NEXUS. The specific inputs I utilized are discussed in Exhibit A-30. I then ran a *No NEXUS Case*, in which the NEXUS pipeline is removed from the simulation, but all other inputs are held constant. Comparing the prices from the *Base Case* to those from the *No NEXUS Case* allowed me to estimate the impact on prices attributable to NEXUS. I also conducted a sensitivity analysis to estimate the benefits of NEXUS under higher demand conditions, which I describe later in my testimony.

**Q22. What is GPCM?**

A22. GPCM allows for the simulation of the operation of the natural gas system at a highly granular level including flows across pipelines, production by gas suppliers, consumption by gas customers, the utilization of storage, and the other various interactions between supply, demand, and infrastructure from which market prices are set. It is the industry-standard application for this purpose and is in widespread use among pipelines, utilities, regulators, and consultancies.

**Q23. Where does the data that serves as inputs to the simulations come from?**

A23. From a variety of sources. GPCM comes loaded with a range of operational and economic data from the software vendor, which FTI updates on an ongoing basis. Custom datasets developed by FTI that are included in the simulations include those related to supply, demand, infrastructure projects, transportation costs, and other variables.

**Q24. What time period did you simulate?**

A24. I ran simulations for ten years beginning in 2022. I then extended the forecasts through linear extrapolation through 2038, the year in which the Company's entitlements end.

**Q25. Why did you take this approach instead of running 20-year simulations?**

A25. Long-term forecasts are often based on extrapolation of nearer-term forecasts, one reason for which is that doing so reduces the need to speculate on discrete events and their timing in the future. This issue applies most specifically to new gas infrastructure, which is simultaneously important and difficult to predict. Although

I find it highly likely that new gas projects will be built in the mid-2030s and beyond, it cannot be yet known where they will be built, how large they will be, or when they will be commercialized. My approach of combining a shorter forecast with extrapolation for periods farther into the future attempts to balance the need to incorporate expected changes to the system into forecasts with the desire to avoid biasing results with speculative or arbitrary assumptions.

**Q26. Can you provide your *Base Case* price forecasts?**

A26. Average annual prices under the *Base Case* forecast for Dawn, Ontario (Dawn), the MichCon Citygates (MichCon), Clarington, and Kensington are shown below:

**Table 1. Average Annual *Base Case* Prices *($/MMBtu)***

| | Dawn | MichCon | Clarington | Kensington |
|---|---|---|---|---|
| 2022 | $2.65 | $2.68 | $2.19 | $2.35 |
| 2023 | $2.52 | $2.56 | $2.05 | $2.22 |
| 2024 | $2.50 | $2.55 | $2.05 | $2.24 |
| 2025 | $2.59 | $2.63 | $2.06 | $2.27 |
| 2026 | $2.62 | $2.67 | $2.05 | $2.28 |
| 2027 | $2.70 | $2.73 | $2.11 | $2.33 |
| 2028 | $2.79 | $2.83 | $2.19 | $2.41 |
| 2029 | $2.95 | $2.99 | $2.29 | $2.52 |
| 2030 | $3.04 | $3.09 | $2.37 | $2.61 |
| 2031 | $3.18 | $3.22 | $2.46 | $2.72 |
| 2032 | $3.29 | $3.33 | $2.54 | $2.81 |
| 2033 | $3.40 | $3.44 | $2.61 | $2.90 |
| 2034 | $3.52 | $3.55 | $2.69 | $2.99 |
| 2035 | $3.63 | $3.67 | $2.78 | $3.08 |
| 2036 | $3.76 | $3.80 | $2.86 | $3.18 |
| 2037 | $3.88 | $3.92 | $2.95 | $3.28 |
| 2038 | $4.01 | $4.05 | $3.04 | $3.38 |

Line
No.

**Q27. Did you validate the reasonableness of the *Base Case?***

A27. Yes.

**Q28. How?**

A28. Among the ways I validated the *Base Case* results was by comparing the prices for key indices to prevailing forward gas prices and by comparing my outlook of gas consumption by sector in Michigan to other available forecasts.

**Q29. Can you please explain?**

A29. I retrieved forward gas prices that settled on February 25, 2021 for a large number of pricing indices in markets in and around Michigan, including Dawn, MichCon, Consumers Citygate (Consumers CG) and Chicago Citygate (Chicago CG). I also retrieved prices from the regions where NEXUS sources its gas, including, Dominion South Point (Dominion South), receipts into TETCO Market Zone 2 (TETCO M2), and the 200 leg of Zone 4 on the Tennessee Gas Pipeline (TGP Z4 200L). By comparing the forward prices to the *Base Case* forecasts, I was able to determine whether the two were in general agreement regarding future price levels. Detailed comparisons of the *Base Case* price to the futures are shown in Exhibit A-30.

**Q30. Did you validate the Kensington and Clarington prices in the same manner?**

A30. Yes. Kensington is priced based on the TGP Z4 200L price while Clarington gas is priced based on the TETCO M2 price. I used those prices to validate the reasonableness of the forecast.

**Q31. Can you explain the demand forecasts to which you compared the *Base Case* outlook?**

A31. I compared the forecasts of gas consumption in the East North Central "ENC" region, the U.S. census region that includes Michigan, from the two most recent Annual Energy Outlooks ("AEO"), which are developed by the Energy Information Administration ("EIA"), to the demand forecasts I developed using GPCM. Specifically, I compared forecast growth rates for the Company's demand to the ENC forecast for gas consumption for generation and also the DTE Gas forecasts of consumption by customer type (*e.g.* residential, commercial, or industrial) to the corresponding forecasts in the AEOs. Results are shown below. In each instance, I concluded that the outlooks were sufficiently consistent with each other that they validated the *Base Case* demand outlook. Additional detail about the comparison is provided in Exhibit A-30.

**Table 2. Comparison of Base Case and AEO Consumption Forecasts**

| Sector | Forecast | Area | *Units* | 2022 | 2038 | Growth rate |
|---|---|---|---|---|---|---|
| Total | 2021 AEO | ENC | *Tcf* | 4.3 | 5.4 | 1.4% |
| | 2020 AEO | ENC | *Tcf* | 4.6 | 5.4 | 1.0% |
| | FTI | Michigan | *Bcf* | 980 | 1,167 | 1.1% |
| Residential | 2021 AEO | ENC | *Tcf* | 1.3 | 1.2 | -0.6% |
| | 2020 AEO | ENC | *Tcf* | 1.3 | 1.1 | -0.7% |
| | FTI forecast | Michigan | *Bcf* | 106 | 94 | -0.8% |
| Industrial | 2021 AEO | ENC | *Tcf* | 1.2 | 1.4 | 1.0% |
| | 2020 AEO | ENC | *Tcf* | 1.4 | 1.5 | 0.6% |
| | FTI | Michigan | *Bcf* | 73 | 90 | 1.3% |
| Commercial | 2021 AEO | ENC | *Tcf* | 0.7 | 0.8 | 0.4% |
| | 2020 AEO | ENC | *Tcf* | 0.8 | 0.8 | 0.0% |
| | FTI | Michigan | *Bcf* | 74 | 73 | -0.1% |
| Electric | 2021 AEO | ENC | *Tcf* | 1.1 | 2.0 | 3.8% |
| | 2020 AEO | ENC | *Tcf* | 1.2 | 2.0 | 3.1% |
| | FTI | Michigan | *Bcf* | 69 | 111 | 3.0% |

Line No.

**Q32. What was your next step after validating the results of the *Base Case*?**

A32. I next ran the *No NEXUS Case* and calculated the difference in prices. The *No NEXUS Case* has the same inputs as the *Base Case* with the one exception that NEXUS is removed.

**Q33. Can you explain the difference in prices between the *Base Case* and the *No NEXUS Case?***

A33. Prices in the areas where NEXUS delivers gas are lower in the *Base Case* than in the *No NEXUS Case*. For example, the MichCon price is roughly $0.08/MMBtu (3%) lower, on average, in the *Base Case*, as shown in Table 3. The Dawn price is also lower, but to a smaller extent. The change in prices for Dominion South is also shown in Table 3. That price is, on average, lower in the *No NEXUS Case*, as are the prices of other Appalachian indices, because NEXUS increases demand for local production which, all else equal, puts upward pressure on prices. Additional detail from the forecasts is provided in Exhibit A-30.

**Table 3. Summary of Price Impacts for MichCon, Dawn, and Dominion South (*$/MMBtu)***

| | *Base Case* | *No NEXUS* | Price Change |
|---|---|---|---|
| MichCon | $3.16 | $3.24 | $0.08 |
| Dawn | $3.12 | $3.18 | $0.06 |
| Dominion South | $2.23 | $2.19 | ($0.04) |

## <u>Calculation of Benefits</u>

**Q34. Can you summarize your calculations in this section of your testimony?**

A34. In this section of my testimony I explain how I estimated the total savings to customers in Michigan that results from the price changes I estimated from the price forecasts I discuss above. I quantify the benefit to DTE Gas of being able to purchase gas at either Kensington or Clarington, the additional savings that DTE Gas will realize from the reduction in local prices caused by NEXUS, and the savings from the same source that other consumers in Michigan will benefit from. I then explain how I deducted the cost of holding NEXUS entitlements from these savings to calculate a total benefit attributable to NEXUS of $1 billion for the period 2022-2038. Finally, I explain how the results of an alternative simulation shows that benefits could be even higher than that if demand and/or prices increase in the future.

**Q35. How does NEXUS create savings for the Company?**

A35. Gas cost reductions are achieved through two mechanisms. *First*, DTE Gas' entitlement allows it to purchase gas at Kensington and Clarington instead of in Michigan. Prices in Kensington and Clarington are typically lower, so this reduces the purchase price. *Second*, if NEXUS did not exist, prices in Michigan would be higher, as I discuss above, meaning that all of DTE Gas' purchases in Michigan would be made at a higher price. To the extent that the Company's cost to hold its NEXUS entitlement is less than the reduction in costs that NEXUS creates by these two mechanisms, net savings are created.

**Q36. Have you calculated these savings?**

A36. Yes. Net savings each year are shown in Table 4.

**Table 4. DTE Gas Savings *($millions)***

| | Energy Savings | Contract Costs | Net Savings |
|---|---|---|---|
| 2022 | $33.7 | ($21.1) | $12.6 |
| 2023 | $31.2 | ($21.1) | $10.1 |

| | | | |
|---|---|---|---|
| 2024 | $21.5 | ($21.1) | $0.3 |
| 2025 | $23.2 | ($21.1) | $2.1 |
| 2026 | $25.7 | ($21.1) | $4.6 |
| 2027 | $27.3 | ($21.1) | $6.2 |
| 2028 | $28.2 | ($21.1) | $7.0 |
| 2029 | $29.4 | ($21.1) | $8.3 |
| 2030 | $30.3 | ($21.1) | $9.3 |
| 2031 | $34.4 | ($21.1) | $13.3 |
| 2032 | $35.7 | ($21.1) | $14.5 |
| 2033 | $37.0 | ($21.1) | $15.9 |
| 2034 | $38.4 | ($21.1) | $17.3 |
| 2035 | $39.8 | ($21.1) | $18.7 |
| 2036 | $41.4 | ($21.1) | $20.2 |
| 2037 | $42.9 | ($21.1) | $21.8 |
| 2038 | $34.6 | ($17.6) | $17.0 |
| Total | $554.5 | ($355.1) | $199.4 |

Over the period indicated, the NEXUS agreement creates $199 million in savings for DTE Gas customers.

**Q37. Did you also find estimated savings arise for other customers in Michigan from NEXUS?**

A37. Yes. My estimate of the savings for the non-DTE customers is based on the change in Michigan delivered prices. Because there is no one price index that captures all of the Michigan market, I used an average of the difference each month between the *Base Case* and the *No NEXUS Case prices* for Consumers CG, Dawn, Chicago CG, and Emerson. That differential, on average, was approximately $0.06/MMBtu. For each month of the forecast I calculated the savings by multiplying the average price change by the forecast of non-DTE consumption.

**Q38. Can you summarize your results?**

A38. I estimate the total savings associated with NEXUS for all Michigan gas customers for the period 2022-2038 to be approximately $1 billion.

**Table 5. Savings Estimate *($millions)***

| | |
|---|---|
| DTE Electric | $11 |
| DTE Gas | $199 |
| Non-DTE | $808 |
| Total | $1,018 |

## Alternative Case

**Q39. Did you simulate any other scenarios?**

A39. Yes, I developed a *High Demand Case* in which I applied a roughly 8% increase to demand for the ENC states, held all other factors constant with the *Base Case*, and then ran the *High Demand Case* with and without NEXUS. I compared the prices and, using the results of that comparison, calculated the benefits to Michigan consumers in the same manner as I describe above.

**Q40. What did you find?**

A40. That savings attributable to NEXUS increased considerably even though the price effect is relatively small. Prices at MichCon, for example, went up by an average of about $0.15/MMBtu during January and February but only by about $0.02/MMBtu overall, compared to the *Base Case*. Regardless, the change was enough to significantly increase the savings I calculated by comparing the *High Demand Case* prices with and without NEXUS included in the simulation. The overall benefits rose to over $1.2 billion, an increase of roughly 24%.

**Q41. How would you characterize this finding?**

A41. It is important. It means that NEXUS provides a useful hedge that helps reduce Michigan's exposure to long-term changes in prices. This result also suggests that the investment in NEXUS creates benefits under fundamentally different market conditions. As I explain above, my analysis indicates that NEXUS creates significant benefits for gas consumers in Michigan in the current, low price environment. That the investment performs even better when prices increase means that there are unlikely to be any changes to market pricing paradigms that would push the investment "out of the money." Finally, this finding suggests that even modest increases in gas prices could lead to significant extra benefits.

## Comparison to the November 2015 Report

**Q42. How do your findings and conclusions compare with the 2015 ICF Study that you previously referenced?**

A42. My findings and conclusions are generally consistent with those described in the 2015 ICF Study. My analyses show that NEXUS creates savings for DTE Gas customers, which is the same result described in the November 2015 Report.

**Q43. Your estimates of benefits are lower than those shown in the November 2015 Report; do you have any explanation as to why that is?**

A43. While I did not prepare the November 2015 Report, I have reviewed it and have identified some important differences. Among the most obvious of these is that market prices were considerably higher at the time that report was developed than they are now. Table 6 shows average annual MichCon prices since 2014, during which time they have declined significantly. For example, in 2020, prices were, on average, 34% lower than they had been in 2015 and 67% lower than they were in 2014.

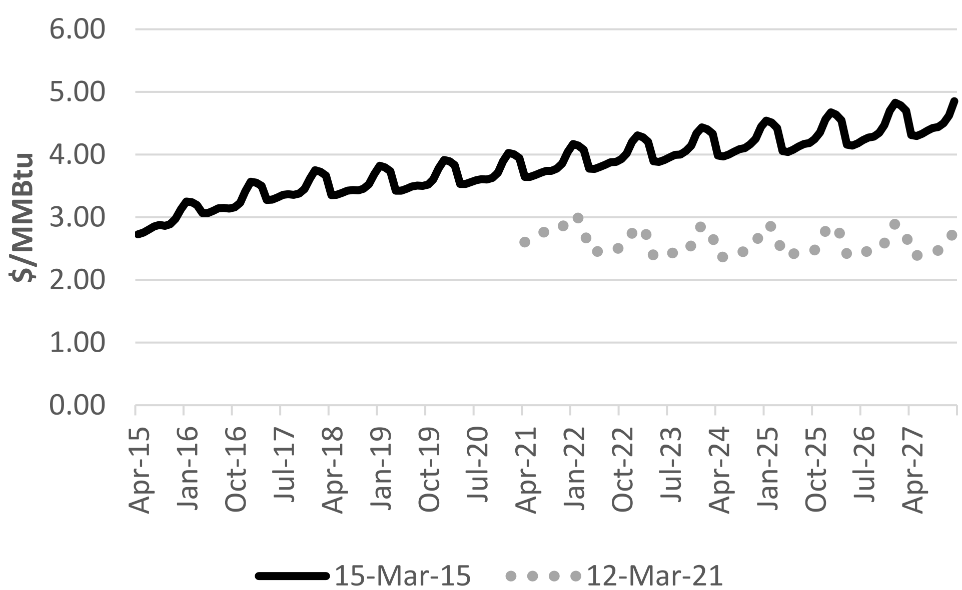
**Table 6. Average Annual MichCon Prices *($/MMBtu)***

| | |
|---|---|
| 2014 | $5.72 |
| 2015 | $2.83 |
| 2016 | $2.49 |
| 2017 | $2.93 |
| 2018 | $3.00 |
| 2019 | $2.36 |
| 2020 | $1.87 |

**Expectations regarding future prices were also considerably different at the time the November 2015 Report was written.**

Figure 2 compares the forward curve prices for the Henry Hub, an important benchmark of North American gas prices, that settled on the New York Mercantile Exchange (NYMEX) in March 2015 to settlements for the same product from March 2021. The former reflects an expectation that prices would follow a strong upward trajectory, quickly rising above $3/MMBtu and continuing to climb from there. The 2021 curve, on the other hand, indicates an expectation of prices that actually decline moderately over time.

**Figure 2. Henry Hub Forward Curves *($/MMBtu)***




**Q44. Why does this matter?**

A44. Because, all else equal, gas infrastructure tends to be most valuable when prices are highest. This tendency is confirmed by my findings from the *High Demand Case*.

**Q45. Are there indications of consistency between the NEXUS benefits estimate from the November 2015 Report and your NEXUS benefits estimate?**

A45. Yes, there are. When evaluated on a percentage basis, my estimate of the price reduction is not dissimilar to the one shown in the November 2015 Report. Over the forecast period, my forecast indicates that average MichCon prices are reduced by NEXUS by approximately 2.5%, from \$3.24/MMBtu to \$3.16/MMBtu. The November 2015 Report indicated that prices would be lower by \$0.21/MMBtu because of NEXUS, which is larger than my projected change, but which indicates only a 3.6% change in the average MichCon price.

**Table 7. Price Change Comparison *(\$/MMBtu)***

| | FTI | ICF |
|---|---|---|
| Base | \$3.16 | \$5.87 |
| No NEXUS | \$3.24 | \$6.08 |
| Change | \$0.08 | \$0.21 |
| % change | 2.5% | 3.6% |

**Q46. What conclusions have you reached about the November 2015 Report?**

**It is unreasonable to require perfect accuracy in hindsight in order for a forecast to be acceptably precise. Instead, it is necessary to understand the context in which a forecast was made and analyze the degree to which it aligns with available information and prevailing market expectations at the time it was made. In the case of the November 2015 Report, the higher forecast of market prices reflected broader sentiments held by the industry that are reflected in the NYMEX curves shown in**

A46. Figure 2 and elsewhere. Since there seems to be a positive correlation between overall price levels and magnitude of the benefits that NEXUS generates, higher estimates of those benefits are also logical. I have not identified any basis by which to conclude that the analysis described in the November 2015 Report was unreasonable nor that the Company was unreasonable in relying on its findings when it made its decision to execute contracts on NEXUS. Moreover, the key conclusion from those two studies remains the same: NEXUS creates savings that are greater than its costs.

**Other benefits**

**Q47. Has NEXUS reduced gas prices in Michigan since it has been in service?**

A47. Yes, it has.

**Q48. What is your basis for the assertion that NEXUS has reduced gas prices in Michigan since it has been in service?**

A48. The observation that the market conditions which create the expected reductions during the forecast have also been emergent since NEXUS came online. Most important among these is the fact that gas prices in Appalachia are lower than they are in Michigan and also lower than in many of the other basins from which gas flows to the Upper Midwest. The flows of inexpensive gas into Michigan from NEXUS have necessarily displaced deliveries of more expensive supplies, which has reduced prices in Michigan in the sense that they would be higher had NEXUS never been built.

**Q49. Can you say how large these price reductions have been?**

A49. If all else were equal, I would expect the magnitude of the price reduction to be generally similar to that observed during the forecast period. That being said, the period since NEXUS was commercialized is a short one during which some extraordinary events have occurred. Most notably, the COVID-19 pandemic brought changes to markets that included significant reductions in gas demand. Notwithstanding the impacts of the pandemic, NEXUS flowed significant volumes of competitively priced gas, without which prices in Michigan certainly would have been higher during this period.

**Q50. Other than reducing gas costs, does NEXUS provide any other benefits for Michigan gas consumers?**

A50. Yes, NEXUS provides a number of other benefits, one of the most important of which is better fuel security. There are only a relatively small handful of interstate pipelines that serve Michigan and, of those, many of the largest and most important were designed to source gas in the same region and follow a similar path to the market. PEPL, the ANR Pipeline, and Northern Natural Gas Company (NNG) are among Michigan's most important sources of energy and each were designed to source gas in and around Texas for transportation to the Upper Midwest. This means that disruptions in certain producing areas or transmission corridors could have outsized effects. NEXUS creates a short, direct path from Appalachia to Michigan, which creates an important degree of diversity and reduces the likelihood

Line No.

that an event currently difficult to foresee could threaten reliability in Michigan. Additionally, gas pipelines can suffer from mechanical failures which are infrequent, but which have the potential to be very impactful since Michigan's capacity to bring gas into the market is spread among a relatively small number of pipelines, each of which has a correspondingly large share of the total delivery capability. As a result, a single mechanical failure can have widespread effects. A new pipeline that is largely unconnected to other systems creates operational redundancies that improve the chances Michigan could avoid critical supply disruptions even when pipeline emergencies occur.

**Q51. Are there other benefits that should also be considered?**

A51. Yes, additional benefits from NEXUS include enhanced competitiveness for Michigan's electric generation fleet. Lower gas prices reduce costs for gas-fired generators in Michigan whether they hold NEXUS entitlements or not. This means that, all else equal, the Company's generators and other gas-fired generators in Michigan will be called upon to run more often in wholesale markets, and, when they do run, their margins will be greater. NEXUS also creates environmental benefits in the sense that economic supplies of natural gas are a necessary precondition for the deployment of new and efficient gas-fired generation, which, in turn, allows for the displacement of coal-fired generation in Michigan and, potentially, elsewhere, while also providing an important tool for managing the intermittency of renewable generators being added to the system in increasing amounts.

**Q52. Does NEXUS also improve reliability?**

A52. Yes. Michigan's reliability is necessarily enhanced from having another pipeline in service since the likelihood of an impactful outage from a failure on a single system is lower. Additionally, NEXUS enhances the diversity of Michigan's gas supplies, which creates economic benefits since NEXUS sources gas in Appalachia, where prices are low, but also reliability benefits since the effects of a supply disruption specific to one region would be potentially mitigated.

**Q53. Has the Commission recognized the importance of reliability benefits from new pipeline projects in the past?**

A53. Yes. The Commission recently approved SEMCO Energy Company's (SEMCO's) Marquette Connector Pipeline, which was motivated, in part, by SEMCO's desire to increase the diversity of its supplies and not become unduly reliant on any one system. The Commission cited the factors for its approval, including the project's ability to "increase the reliability of natural gas service to many of SEMCO's customers [and] provide much-needed redundancy in the event of a pipeline rupture."[2] NEXUS provides these same benefits.

## Conclusions

**Q54. Can you summarize your primary conclusions?**

A54. My primary conclusion is that the NEXUS pipeline brings many benefits for DTE Gas and the state of Michigan, and the benefits Michigan's gas consumers will realize far outweigh its costs. I expect savings totaling $199 million for DTE Gas customers and $1 billion for all Michigan consumers over the period 2022-2038.

[2] Order Approving Settlement Agreement, Filing number U-18202-0061.

Line
No.

Additionally, my modeling shows that savings could be considerably higher under certain conditions.

**Q55. Does this conclude your testimony?**

A55. Yes.

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of<br>**DTE GAS COMPANY** for reconciliation of<br>its gas cost recovery plan (Case No. U-20543)<br>for the 12 months ended March 31, 2021.<br>_____________________________________________ | )<br>)<br>)<br>)<br>) | Case No. U-20544 |

EXHIBITS

Of

MATTHEW J. DECOURCEY


# Matthew DeCourcey

Managing Director

matthew.decourcey@fticonsulting.com

200 State Street

9th Floor

Boston, MA 02109


**Education**

MBA in Finance, University of Massachusetts at Amherst

B.A. in Political Science, University of Massachusetts at Boston

Matthew DeCourcey is a Managing Director in the Power and Utilities practice, where he provides advisory services to utilities, investors, regulators, and infrastructure developers in jurisdictions throughout North America. His areas of expertise include the analysis of gas and power markets, utility ratemaking, investment advisory, and policy analysis.

## PROFESSIONAL EXPERIENCE

- *FTI Consulting,* Managing Director, Boston MA, March 2018 – Present
- *Concentric Energy Advisors*, Project Manager and Principal, Marlborough MA, January 2016 – February 2018
- *Levitan & Associates*, Senior Consultant, Boston MA, October 2004 – December 2015

## SELECTED ENGAGEMENTS

Engagements listed below comprise a representative sampling of recent consulting projects Mr. DeCourcey has undertaken in areas of relevance. They include assignments undertaken while at FTI and at previous employers.

*Infrastructure Investments*

*Pipeline Development.* On behalf of DTE Electric and DTE Gas, developed an expert report estimating the impacts to its customers from the development of the NEXUS Gas Transmission pipeline. Simulated gas markets in the Upper Midwest and supply regions to determine the impact on the delivered cost of gas to consumers in Michigan.

*System Expansion.* On behalf of Millennium Pipeline, developed an expert report estimating the gas and electric market benefits of the Eastern System Upgrade. Simulated gas and power markets to determine ESU's impacts on market prices in eastern New York. Expert report submitted to the FERC in support of CPCN application. ESU is now in service.

*New Pipeline Development*. Conducted an analysis on behalf of Spire, Inc. of the benefits of the new STL pipeline. Using GPCM, analyzed impacts to market prices and customer savings in submission of STL's CPCN application before the FERC. STL went into service in 2019.

*Cross-Border Pipeline Projects*. Served as advisor to Comisión Federal de Electricidad (CFE), the holder of entitlements on several new pipelines designed to export U.S. gas supplies to Mexico, during commercial negotiations with project developers. Evaluated economic and financial aspects of agreements and provided strategic advisory to support negotiations.

*New Pipeline Development*. Conducted a study for Tallgrass Energy, developers of the Cheyenne Connector pipeline, to analyze the project's benefits. Simulated gas markets in GPCM to determine project impact on local prices to support CPCN proceedings. The project went into service in 2020.

*Offshore Wind Development*. On behalf of Atlantic Wind Connection, the developers of the New Jersey Energy Link project, conducted modeling to quantify market benefits to customers deriving from relief of capacity price congestion, and environmental benefits associated with new transmission and generation projects.

*LNG Storage*. Advised Northstar Industries regarding the market benefits of its proposed LNG Peaking facility in Maine. Developed analyses to quantify net contract benefits and participated in proceedings before the Maine PUC (2016-0020) to discuss findings.

*LNG-to-Power.* Advised the developer of a Central American LNG-to-Combined Cycle project regarding project economics, fuel supply planning, contracting, and related commercial issues.

*Competitive Procurement of Electric Infrastructure.* On behalf of the New York Power Authority, evaluated proposals for generation and transmission infrastructure in New York. Developed simulations to forecast market energy and capacity prices, conducted financial analysis of bids, and supported contract negotiations.

*Utility Prudency.* Advised Municipal Light & Power, the municipal utility serving Anchorage, AK, in its rate case (U-17-008) before the Regulatory Commission in Alaska on matters related to the prudence of its investment in new combined cycle generation. Oversaw a team that conducted market analyses to quantify the benefits of the new facilities, evaluated gas supply conditions on the Kenai peninsula, and conducted benchmarking analyses to demonstrate the reasonableness of the project's costs.

*Confidential Infrastructure Investor.* Conducted due diligence on an HVDC interconnection between NYISO and an adjoining market on behalf of an investment bank to support a bid to purchase the asset. Utilized proprietary models to estimate energy and capacity revenues to estimate contribution margin from the project over 20 years, developed an alternative project financial model, and evaluated the benefits of alternative rate structures.

*Gas and Power Markets Analysis*

*Gas Market Competitiveness*. On behalf of a group of shippers, filed expert testimony on the competitiveness of natural gas markets, arbitrage opportunities, and imbalance cashout mechanics in a proceeding before the FERC regarding ratemaking on the Transcontinental system (RP20-614 / RP20-618). Reported findings that the markets of relevance were sufficiently competitive that arbitrage opportunities do not exist along with identification of flaws in the manner in which the system was conducting is accounting of gains and losses supported resolution via settlement at terms favorable to the shippers.

*Aliso Canyon Retirement.* Currently advising the California Public Utilities Commission regarding strategic options to retire the Aliso Canyon gas storage facility while maintaining electric reliability. Leading a team conducting market studies to identify investments that could replace unserved, gas-fired generation in the event of the facility's retirement, conducting hydraulic analyses to evaluate system operations, and developing long-run gas and power forecasts in order to analyze economic and financial impacts of new infrastructure.

*Gas-Electric Reliability Analysis.* On behalf of the Eastern Interconnect Planning Collaborative, a consortium of the six RTOs that comprise the North American Eastern Interconnect, conducted a major study on gas-electric interdependence. Oversaw gas and electric simulation modeling to analyze gas deliverability under peak demand conditions and identify electric generation that could be impossible to serve because of constraints on the pipeline system. Identified investments and market rule changes that could mitigate risks.

*Cross-Border Pipeline Issue.* Advised a U.S. gas and electric utility in a dispute regarding taxes on cross-border pipeline flows under NAFTA. Under NAFTA rules, LNG imports are taxed at specific rates and all gas may be assumed to be re-gasified LNG unless demonstrated otherwise. Led a project team to conduct analyses of gas markets and pipeline flows to demonstrate that gas imported at the points at which the utility held transportation contracts could not plausibly be re-gasified LNG. Findings supported a favorable conclusion.

*Capacity Market Design.* Advised the Industrial Power Consumers Association of Alberta, a consortium of industrial consumers, regarding proposals to implement a capacity market mechanism in Alberta. Conducted comparative reviews of proposed market designs, analyzed economic impacts, and proposed improvements. FTI's findings were presented in an expert report filed with the Alberta Utilities Commission.

*Nuclear Plant Failure*. Analyzed gas and electric markets in California to support MHI in arbitration proceedings regarding the failure of the San Onofre Nuclear Generation Station.

*Utility Ratemaking*

*Capacity Market Rulemaking*. Represented Equinor Wind before the FERC in multiple matters (ER16-1404, ER20-1718) related to electric market rules, participant mitigation, and wholesale capacity markets.

*Distribution Rate Case*. Provided advisory services and testimony on multiple matters regarding Liberty's gas and electric subsidiaries in rate cases before the New Hampshire PUC (DE19-064, DG19-161, DG20-105) on topics that include ROE, MCOS, and rate design.

*Spire Missouri*. Provided advisory services to Spire Missouri, an LDC subsidiary of Spire Energy, in the most recent rate case for Mississippi River Transmission, on which Spire is a shipper (RP18-923). Analyzed system flows to determine the appropriateness of proposed tariff designs on MRT, analyzed market conditions to estimate the commercial outlook for MRT capacity, and supported negotiations.

*District of Columbia Office of People's Counsel*. Currently representing OPC in Pepco's ongoing rate case in the District (FC 1156). Responsible for the analysis of Pepco's proposed Multi-Year Rate Plan, including the identification of key flaws, inconsistencies with Commission precedent, and development of alternative MRP formulations.

*Intrastate Rate Case*. Advised Atmos Pipeline Texas in its proceeding before Texas Railroad Commission. Analyzed gas markets to demonstrate that utilization of APT's system could decline because of changes to market prices, that increases in production from Texas supply plays could disadvantage its system, and that expansion of other systems gave APT's key customers alternatives to bypass its service. Findings supported a recommendation to enhance APT's authorized ROE to account for the pipeline's higher levels of risk

*Policy and Strategy*

*RTO Membership Change.* Currently advising a U.S. gas and electric utility regarding the implications of a potential change in RTO membership. Evaluating policy and economic risks and benefits, measuring regulatory risk at the state and federal levels, analyzing ratepayer and shareholder impacts, and developing timelines and action plans to effectuate the membership change.

*Gas Utility M&A*. Advised a major institutional investor regarding the purchase of U.S. utilities in the U.S. Developed a study to compare regulatory environments on a state-by-state basis and estimated the regulatory advantage in each jurisdiction.

*Battery Developer Strategy*. Working with the developer of residential battery and PV systems to understand global supply chains and *pro forma* implications, evaluate U.S. markets, and plan a strategy for entry into selected jurisdictions.

*Market Deregulation*. On behalf of an advocacy group representing the interests of regulated utilities, provided advisory and advocacy related to a proposed Florida ballot initiative to deregulate the electric market in that state. Conducted analyses, supported outreach, and appeared before a joint committee of the Florida legislature to discuss costs and risks.

## RECENT PUBLICATIONS AND MEMBERSHIPS

Member, Energy Bar Association, Renewables and Natural Gas Committees

"Electric Vehicles and Carbon Pricing: Evolution of the Electric Market." FTI Whitepaper, December 2020.

"PJM Market Fundamentals, Operations, and Value Dynamics." *EUCI Course*, with Kenneth Sosnick, January 2020.

"U.S. Observations and Experiences in Natural Gas Infrastructure Investment." *Working Paper of the US-India Strategic Partnership Forum*, with Kenneth Sosnick, et al, December 2019

"Developing the Generation Fleet of the Future." *PowerGen University*, with Keith Paul, November 2019

"Investing in Infrastructure Projects." *Workshop at the 23rd Platts Mexican Energy Conference*, with Dino Barajas, November 2019

"It's Time for Electric Utilities to Re-Energize Their Cybersecurity Efforts." *FTI Journal*, with Jordan Rae Kelly, November 2019

"A Roadmap for Developing the Public Utility of the Future." Working Paper of the American Public Power Association, April 2019

MARCH 31, 2021

# NEXUS Pipeline Impacts Analysis

PREPARED FOR

DTE

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## INTRODUCTION

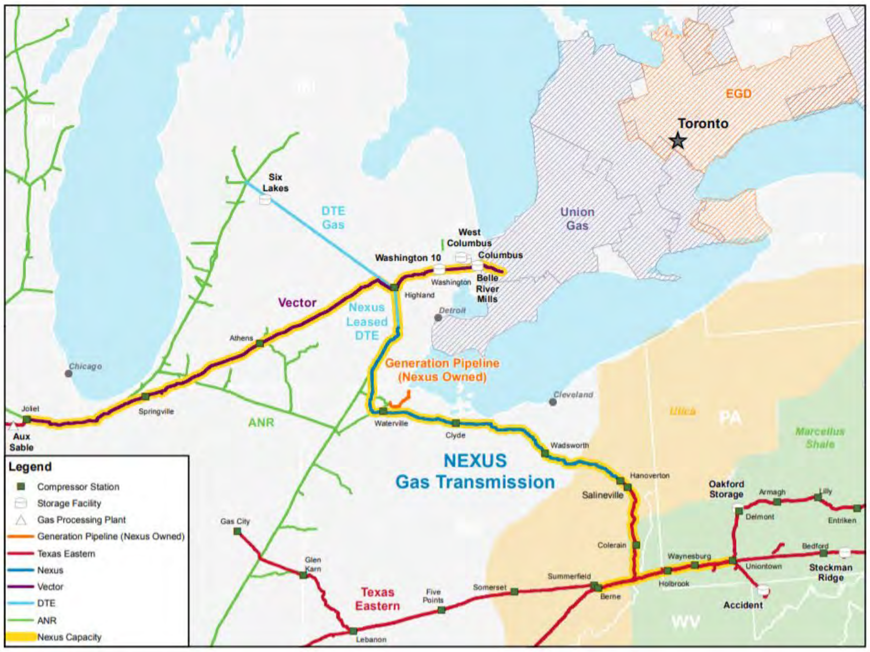
The Power & Utilities practice at FTI Consulting Inc. ("FTI") has been engaged by DTE Gas and DTE Electric (collectively, the "DTE Utilities" or the "Companies") to analyze the impacts of the Nexus Gas Transmission pipeline ("NEXUS") on natural gas prices in Michigan and the savings in gas costs that accrue to customers in that state as a result. To do so, a team of experts from FTI developed simulations of the North American gas markets to forecast market prices in Michigan and elsewhere for the period 2022 to 2038 (the "Forecast Period"), whose end coincides with the termination of the longest-dated entitlements held on NEXUS by the DTE Utilities. Analysis of those prices indicates that NEXUS will create total savings of approximately $1 billion to customers over that time.

This report describes the methods and results FTI used to estimate savings attributable to NEXUS, additional analyses that indicate that savings could be higher if market prices increase in the future, and also additional benefits from NEXUS other than gas cost savings that accrue to customers from the pipeline's commercialization.

### The NEXUS System

NEXUS is a roughly 250-mile pipeline that provides access for consumers in Ohio, Michigan, and Ontario to abundant and economical shale gas supplies. The system receives gas from Marcellus Shale and Utica Shale production areas for delivery to customers in the Upper Midwest via connections with the DTE Gas Transmission System and the Vector Pipeline. NEXUS also enhances shippers' ability to utilize gas storage, including the facilities located at Dawn, Ontario. Initially, the Kensington gas processing plant in Ohio ("Kensington") was envisioned as the southern terminus of the project. Later, it was determined to expand further south via the Texas East Appalachia Lease ("TEAL") project, which included capacity to a new interconnect with the Texas Eastern ("TETCO") system in Clarington, Ohio ("Clarington"). The entire system, including TEAL, began shipping gas in October 2018. NEXUS can transport up to 1.4 Billion Cubic Feet per Day ("Bcf/d") of gas.

*Figure 1. NEXUS System*[1]




Both of the DTE Utilities hold entitlements on NEXUS. DTE Electric has an entitlement for 30,000 Dth/d to receive gas at Kensington and move it to the interconnect with the DTE Gas System in Ypsilanti, Michigan. In 2022, the size of its entitlement increases to 75,000 Dth/d, the timing of which is designed to coincide with commercialization of the Blue Water Energy Center ("BWEC"), a combined cycle generation facility currently under construction. The DTE Electric contract also allows it to receive 15,000 Dth/d of that capacity at either Clarington or Kensington until 2022. DTE Electric's capacity contract expires in 2038.

DTE Gas has an entitlement for 75,000 Dth/d that expires in 2033. Under its agreement, DTE Gas can receive up to half of its receipts at Clarington through 2022, after which point its contract calls for all receipts to be made at Kensington; however, FTI is aware of ongoing discussions between DTE Gas and NEXUS to further amend its agreement to extend the period during which it can receive gas at Clarington. For this reason, FTI has assumed that DTE Gas will receive half its entitlement at Clarington and half at Kensington for the entirety of the Forecast Period. This assumption is consistent with recent filings DTE Gas has made before the Commission.

Table 1 shows how the DTE Utilities' NEXUS entitlements change over time. Note that the periods reflect the time periods covered in this analysis; both the DTE Electric and DTE Gas contracts began prior to January 2022.

[1] *Source*: DTE Midstream

*Table 1. NEXUS Entitlements by Time Period (Dth/d)*

| Start | End | Quantity | Receipt Point |
|---|---|---|---|
| **DTE Electric** | | | |
| January 2022 | May 2022 | 15,000<br>15,000 | Kensington/Clarington<br>Kensington |
| June 2022 | October 2022 | 15,000<br>60,000 | Kensington/Clarington<br>Kensington |
| November 2022 | May 2037 | 75,000 | Kensington |
| June 2037 | October 2038 | 30,000 | Kensington |
| **DTE Gas** | | | |
| January 2022 | October 2022 | 37,500<br>37,500 | Kensington/Clarington<br>Kensington |
| November 2022 | October 2033 | 75,000 | Kensington |

Both DTE Electric and DTE Gas pay a negotiated reservation rate of $0.695/Dth for service from Kensington to NEXUS-Ypsilanti. Both also pay a negotiated reservation rate of $0.15/Dth for receipts at Clarington. Each of the DTE Utilities' agreements also includes a fuel charge, which is currently approximately 1.3%.

## Summary of Conclusions

An important motivation for this study is the desire to update previous analyses of the value of NEXUS in the context of current and upcoming proceedings before the Michigan Public Service Commission. Previously, the DTE Utilities have relied on a report dated November 2015 (the "November 2015 Report") to help explain the benefits that NEXUS creates for Michigan ratepayers. That study is now several years old and gas markets have undergone significant changes since it was developed. To capture the effect of these changes and to develop an updated estimate of the savings that NEXUS provides, FTI conducted long-run simulations using a customized version of GPCM, the industry-standard platform for the analysis of natural gas markets in North America.[2] The results of those simulations and related analyses support the following conclusions:

- NEXUS reduces the DTE Utilities cost of gas purchases by approximately $867 million between 2022 and 2038. Over that time, they will pay roughly $657 million for their contracts on NEXUS, meaning that their net savings is approximately $210 million.
- Other gas consumers in Michigan also benefit from NEXUS because it reduces prices in Michigan. Those savings will total approximately $808 million 2022-2038. Therefore, the total savings to customers in the state is approximately $1 billion.
- These amounts are in addition to the savings that consumers in Michigan have already realized since NEXUS has been placed into service.

[2] https://rbac.com/

- If gas prices increase, savings attributable to NEXUS will likely be greater, perhaps by a significant amount.
- In addition to reducing gas costs, NEXUS creates other benefits, including diversity of fuel supply, the value of which FTI has not attempted to quantify but that are nonetheless important.

The remainder of this report is organized as follows. *First,* the simulation analyses that FTI conducted are described in detail. *Second*, the calculations of benefits to customers based on the simulation results are explained and summarized. *Third*, an alternative scenario that demonstrates that NEXUS benefits increase in a higher demand, higher price market is presented. *Fourth*, other benefits that are significant but that are not quantified in this study are identified. Finally, *fifth*, key conclusions and findings are summarized.

## MARKET ANALYSIS

FTI's analytical approach is centered on the development of detailed simulations of the gas markets in Michigan, Appalachia, and surrounding areas that provide a realistic outlook for production, consumption, and the utilization of pipeline infrastructure. The simulation that includes NEXUS, referred to as the *Base Case*, is intended to represent a "business as usual" outlook, against which the results of alternative scenarios can be analyzed. The process by which FTI validated the reasonableness of the *Base Case* is described later in this section.

Once the *Base Case* was finalized, a *No Nexus Case* was run, in which NEXUS was removed from the simulation while all other inputs were held constant. Delivered prices in and around Michigan are higher in the *No Nexus Case*. Since the removal of NEXUS is the only change, the difference in the prices between the two cases is the estimate of NEXUS' impact on the current market and becomes the basis for the calculations of benefits.[3]

All the simulations were conducted on a monthly basis for ten years, from January 2022 to December 2031. FTI then extrapolated results from that ten-year forecast through 2038.

### Modeling Overview

FTI developed the simulations described in this document using a customized version of GPCM that the Power & Utilities team has developed and maintains for that purpose. GPCM is the leading tool to simulate gas markets and is in widespread use by pipeline companies, banks, investors, and regulators, including the Federal Energy Regulatory Commission ("FERC"), and others.[4] The software includes a network model based on equilibrium economics whose inputs and assumptions are developed regarding gas producers' ability to supply gas at various price levels, consumers' willingness to buy gas at various price levels, and costs from transporting and/or storing gas using existing and planned infrastructure, the cost of which is defined by published rates as well as observational data that relates costs and discounting to system utilization levels. In other words, as in the real world, suppliers will produce more

[3] In other words, the prices in the *No NEXUS Case* indicate what prices would be had NEXUS never been constructed.
[4] Additional detail regarding GPCM is included as Appendix 1. GPCM Description.

when prices are high and less when prices are low, consumers are assumed to also be responsive to price to some degree, and infrastructure owners can be expected to discount the cost of transportation or storage compared to maximum tariff rates when demand for their services is low and less when it is high. These dynamics are captured in supply and demand curves for gas as well as for transportation and storage whose parameters, including price, production, and consumption levels as well as elasticities, are based on empirical data collected in the market, as are the characteristics of pipeline and storage facilities on the system (capacity, connections, etc.). Simulation solutions are generated based on convergence to a set of conditions at which the amount of gas produced by suppliers is equal to the amount of gas consumed by customers i.e. the intersection of supply and demand curves or clearing prices. Because physical constraints impose finite limitations on the flow of gas across the system, prices will be lower in locations where there is abundant, inexpensive supplies of gas compared to demand and higher in areas in which demand is higher and the availability of gas production, transportation, or both is limited.

Customers are modeled individually based on their expected consumption patterns; for example, DTE Gas and DTE Electric are each represented as individual entities in GPCM, with customer-specific demand assumptions that are based on both historic and forecast data, system interconnections based on the real-world configuration of the DTE Gas Transportation System and the other gas infrastructure in and around the Companies' service territory (and the entire North American pipeline system), and other relevant data. Suppliers are modeled with similar levels of granularity, as are pipelines and storage facilities. For example, the configuration of NEXUS in the model includes the three zones NEXUS uses for ratemaking; connections with other pipelines, customers, and suppliers based on the system's actual configuration; and other data captured in regulatory filings and public databases. In total, the GPCM database used for this study includes more than 150 gas supply areas; nearly 500 consumers, including utilities, industrials, Liquefied Natural Gas ("LNG") export facilities, and others; almost 300 pipelines, each of which are modeled at similar levels of granularity as is NEXUS; and roughly 450 gas storage facilities. With each simulation, the model reports production, consumption, flows across each segment of infrastructure, and pricing for most publicly available indices, among other data.

### ***Base Case*** **Simulations**

For the *Base Case*, FTI modeled supply and demand outlooks based on publicly available data and internal analyses. Assumptions regarding the development of new pipeline infrastructure also rely on current information. Of particular note for this analysis are projects designed to provide takeaway capacity from the Marcellus and Utica shales. With the completion of NEXUS and the commercialization of the Energy Transfer Partners Rover project ("ET Rover"), there are no large projects designed to provide Appalachian gas a new east-to-west path to new markets.

The outlook accounts for the cancellation of some high-profile projects that would have also added new delivery out of the region, including the Constitution pipeline and the Atlantic Coast Pipeline, both of which were abandoned by their developers in 2020 (although Constitution had been bogged down by a number of permitting challenges for some time).[5,6] FTI has also made the decision to not include the Mountain Valley Pipeline even though it has received its required approvals from the FERC, based on that project's recent, persistent delays. Thus, the number of projects providing new delivery out of the mid-Atlantic region expected to be developed in the next several years is relatively small. Table 2 lists planned and recent system expansions of relevance to the Marcellus and Utica areas that are included in the *Base Case*, along with their capacities and in-service dates ("ISDs"). Both NEXUS and TEAL are intentionally excluded from Table 2.

*Table 2. Base Case* Pipeline Projects *(MMCf/d)*

| Project | ISD | Capacity |
|---|---|---|
| Columbia Gulf Xpress | 2018 | 860 |
| Mountaineer Xpress | 2018 | 2,700 |
| Columbia WB Xpress | 2018 | 1,300 |
| Atlantic Sunrise | 2018 | 1,700 |
| ET Rover | 2018 | 3,250 |
| Columbia Leach Xpress | 2018 | 1,530 |
| Eastern Sore 2017 Expansion | 2018 | 61 |
| Birdsboro (DTE) | 2019 | 79 |
| Adelphia Gateway | 2021 | 350 |
| Appalachia to Market (TETCO) | 2021 | 18 |
| PennEast | 2021 | 1,000 |
| Transco Leidy South | 2021 | 582 |
| Vector BWEC Pipeline | 2022 | 180 |

Aside from the BWEC Pipeline project on Vector, which is a lateral project to support DTE Electric's new generation facility, there are no pipeline expansions planned in Michigan nor have there been any large projects recently completed. The most recent pipeline project in the region is SEMCO Energy Gas Company's Marquette Connector, a new lateral connection from its distribution system to Great Lakes Gas Transmission ("GLGT"), which went into service in 2019.[7]

Once FTI ran the forecast using these assumptions, one way in which the *Base Case* simulation was validated was by comparing the resulting price forecasts to available forwards. Specifically, FTI compiled forward curves from February 25, 2021, which are reported by OTC Global Holdings, L.P. and accessed through S&P Global Market Intelligence ("S&P"), which it compared to the *Base Case* forecast. Below, monthly forecasts for Dominion South Point ("Dominion South"), Texas Eastern Market Zone 2 ("TETCO M2"), and the Tennessee Gas Pipeline Zone 4, 200 Leg ("TGP Z4-200L").

[5] https://napipelines.com/williams-partners-abandon-constitution-pipeline-project/

[6] https://atlanticcoastpipeline.com/news/2020/7/5/dominion-energy-and-duke-energy-cancel-the-atlantic-coast-pipeline.aspx

[7] https://www.uppermichiganssource.com/content/news/SEMCOs-Marquette-Connector-Pipeline-construction-ahead-of-schedule-561245611.html?ref=611

*Figure 2. Base Case* Forecast vs. Forward Pricing: Dominion South

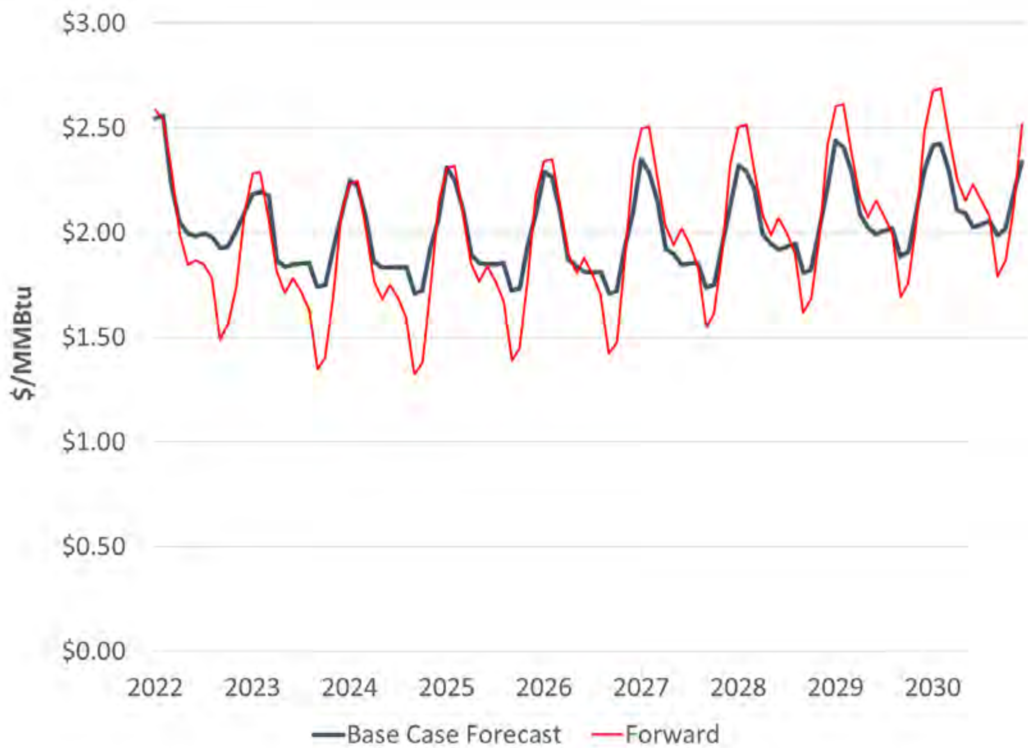



*Figure 3. Base Case* Forecast vs. Forward Pricing: TETCO M2

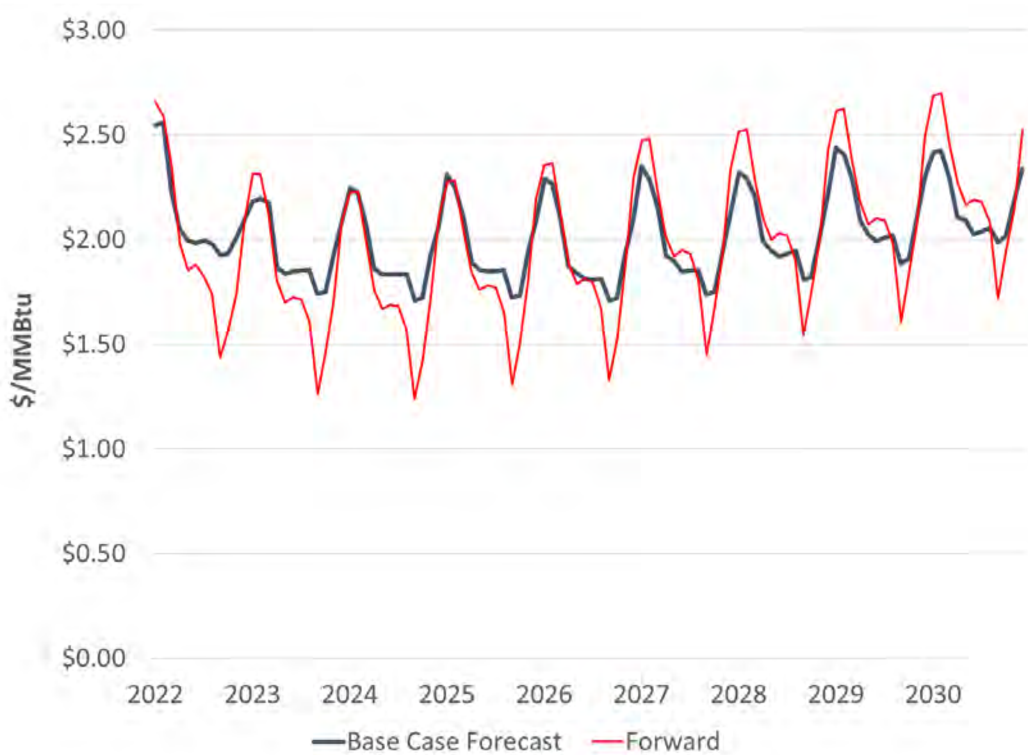
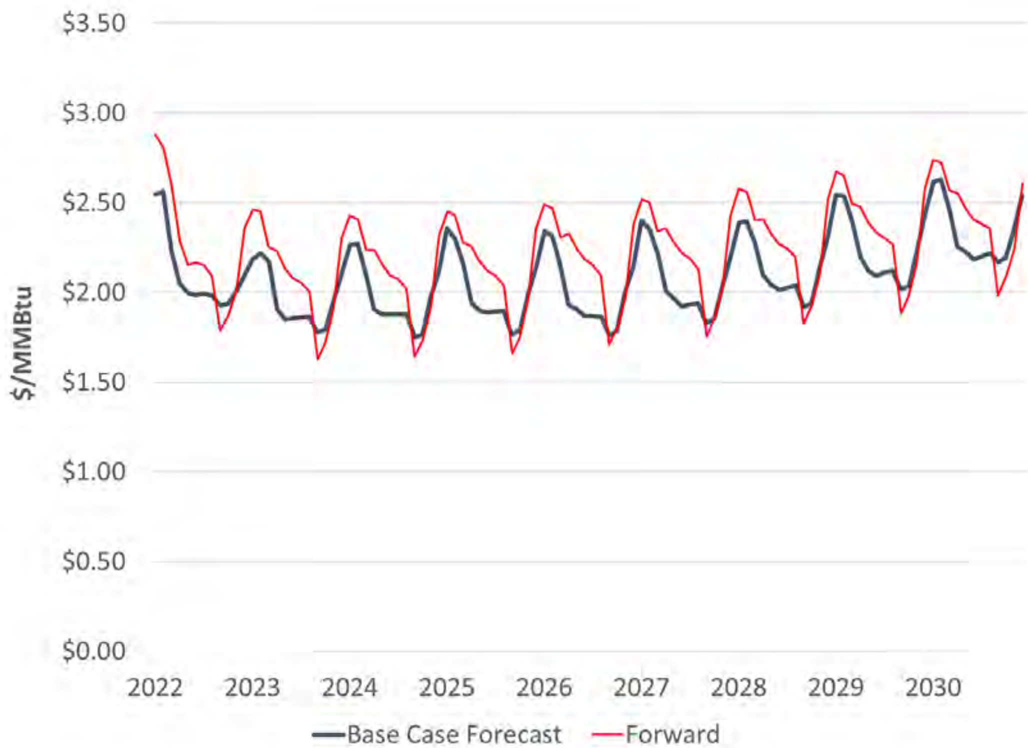


*Figure 4. Base Case* Forecast vs. Forward Pricing: TGP Z4-200L




FTI also calibrated the *Base Case* simulation based on expected prices at Kensington and Clarington. To do so, FTI synthesized forward prices for each location based on pricing relationships to other indices, TGP Z4 200L and TETCO M2, respectively.

*Figure 5. Base Case* Forecast vs. Forward Pricing: Kensington

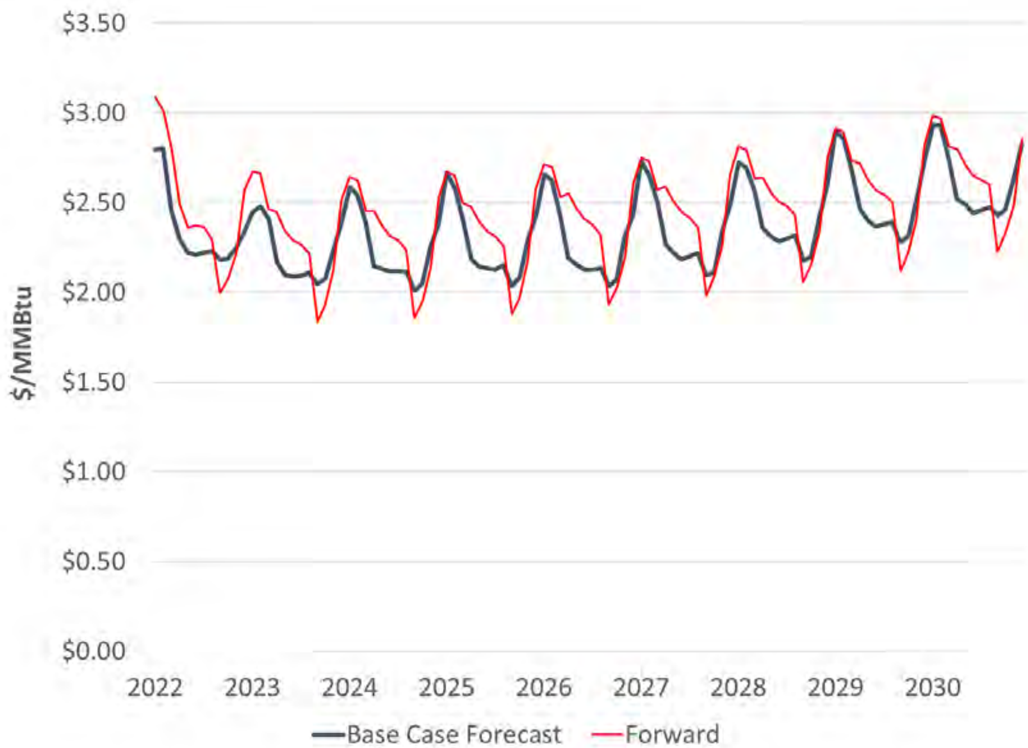
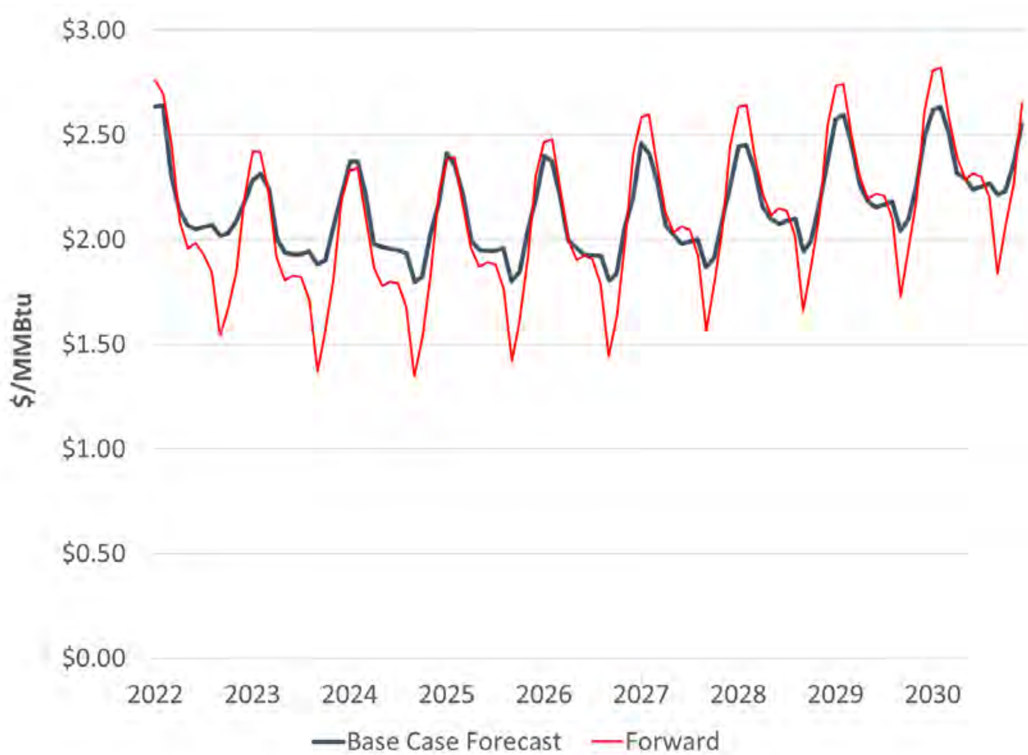



*Figure 6. Base Case* Forecast vs. Forward Pricing: Clarington



FTI also compared pricing points in the areas where NEXUS delivers, including MichCon, Dawn, and the Consumers Energy Citygate ("Consumers").

*Figure 7. Base Case* Forecast vs. Forward Pricing: MichCon

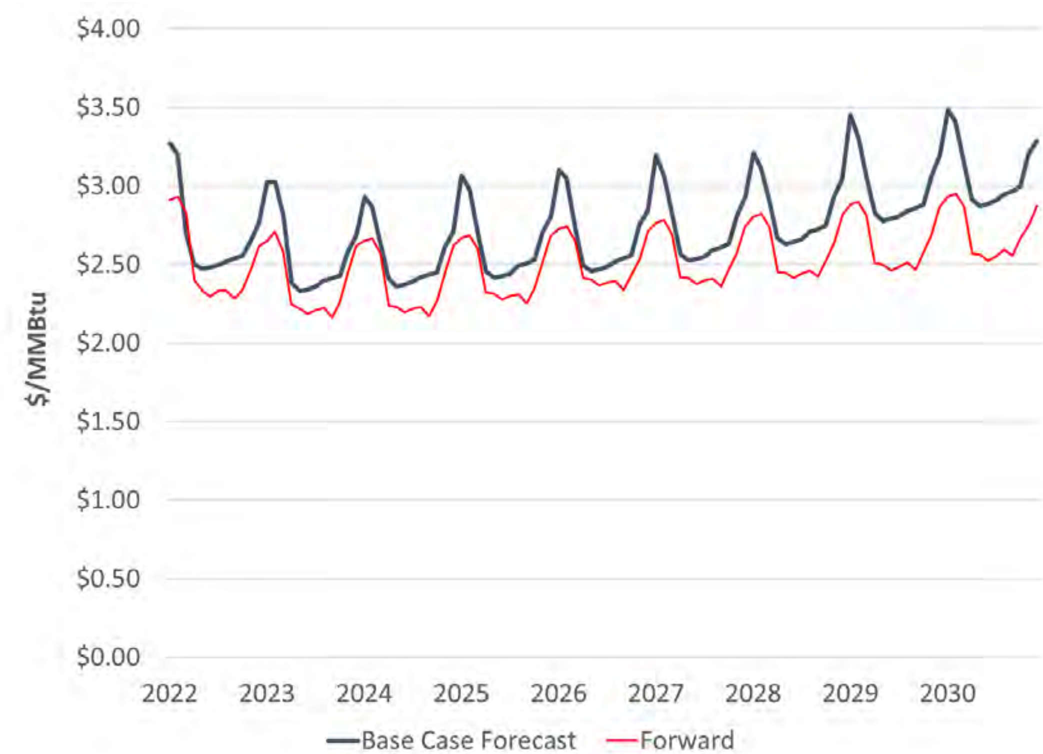


*Figure 8. Base Case* Forecast vs. Forward Pricing: Dawn

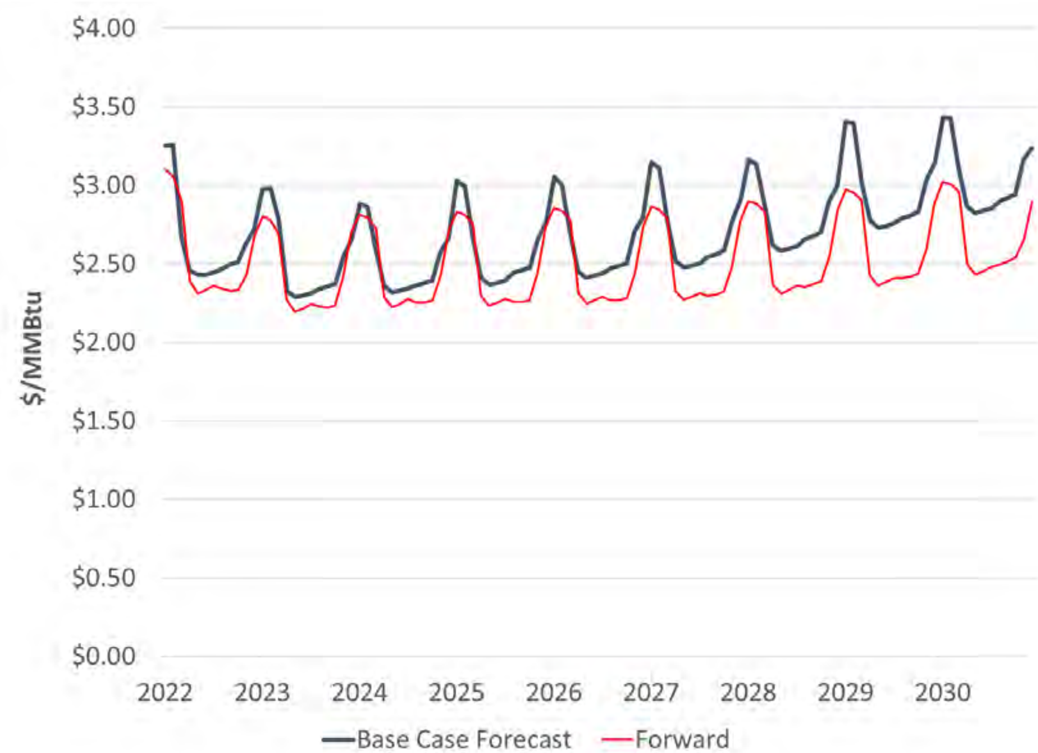
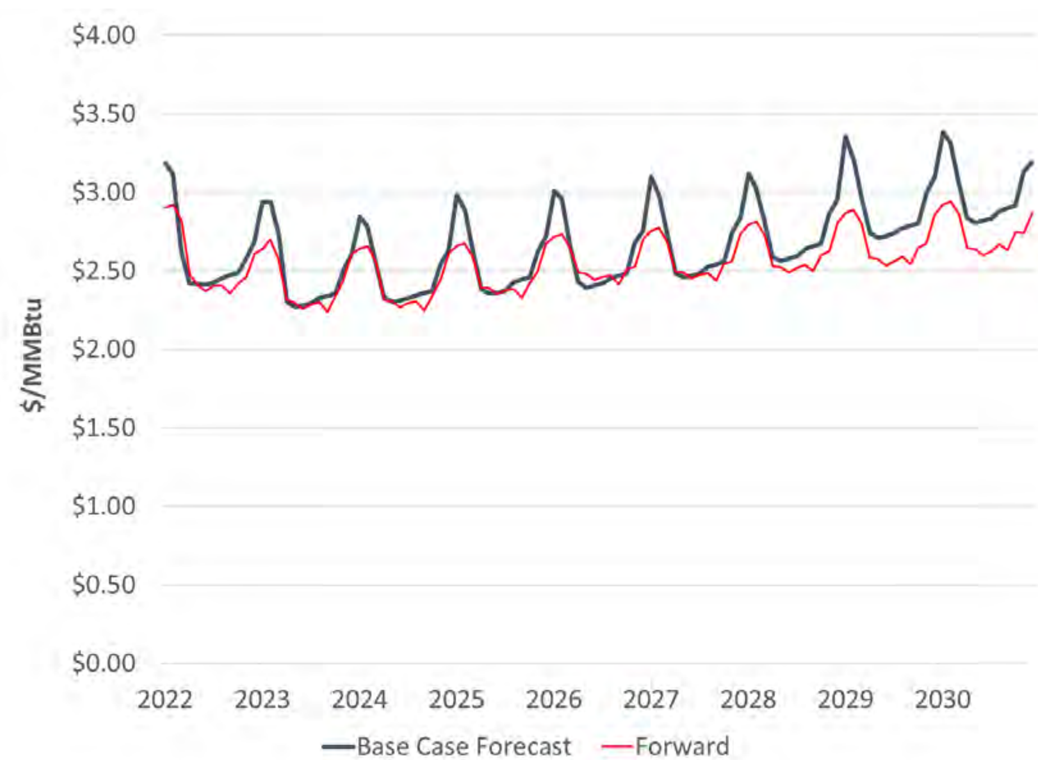



*Figure 9. Base Case* Forecast vs. Forward Pricing: Consumers



The Base Case forecast was also validated by comparing the demand outlook with recent versions of the Annual Energy Outlook ("AEO"), which is published each year by the Energy Information Agency ("EIA"). The AEO includes a series of forecasts that reflect EIA's current projections for energy prices, production, consumption, and other outcomes, differentiated by geographic area, under various scenarios. FTI compared the Base Case demand forecast for Michigan to "Reference Case" demand forecast from each of the last two AEOs, which were published in 2020 ("AEO2020") and 2021 ("AEO2021"). The AEO forecasts are for the East North Central ("ENC") region, the U.S. census region that includes Michigan, Illinois, Indiana, Ohio, and Wisconsin. Therefore, the Base Case forecast is not directly compared to the ENC outlook but, rather, annual rates of growth in annual gas consumption are compared for each of DTE's Residential, Commercial, and Industrial customers and DTE Electric were compared to the corresponding forecasts for ENC consumption from the AEOs. Results are shown in Table 3 below.

*Table 3. Base Case* and AEO Demand Forecast Comparison

| Sector | Forecast | Area | Units | 2022 | 2033 | 2038 | Growth Rate *(2022-2038)* |
|---|---|---|---|---|---|---|---|
| Total | 2021 AEO | ENC | Tcf | 4.3 | 5.0 | 5.4 | 1.4% |
| | 2020 AEO | ENC | Tcf | 4.6 | 4.9 | 5.4 | 1.0% |
| | *Base Case* | Michigan | Bcf | 979.7 | 1,096.8 | 1,166.7 | 1.1% |
| Residential | 2021 AEO | ENC | Tcf | 1.3 | 1.2 | 1.2 | -0.6% |
| | 2020 AEO | ENC | Tcf | 1.3 | 1.2 | 1.1 | -0.7% |
| | *Base Case* | Michigan | Bcf | 106.3 | 99.7 | 93.9 | -0.8% |
| Industrial | 2021 AEO | ENC | Tcf | 1.2 | 1.3 | 1.4 | 1.0% |
| | 2020 AEO | ENC | Tcf | 1.4 | 1.4 | 1.5 | 0.6% |
| | *Base Case* | Michigan | Bcf | 73.4 | 85.1 | 89.5 | 1.3% |
| Commercial | 2021 AEO | ENC | Tcf | 0.7 | 0.8 | 0.8 | 0.4% |
| | 2020 AEO | ENC | Tcf | 0.8 | 0.8 | 0.8 | 0.0% |
| | *Base Case* | Michigan | Bcf | 74.1 | 73.8 | 72.9 | -0.1% |
| Electric | 2021 AEO | ENC | Tcf | 1.1 | 1.7 | 2.0 | 3.8% |
| | 2020 AEO | ENC | Tcf | 1.2 | 1.5 | 2.0 | 3.1% |
| | *Base Case* | Michigan | Bcf | 69.0 | 93.1 | 111.4 | 3.0% |

These data show general consistency between the *Base Case* and the AEO forecasts for each customer segment. All three forecasts indicate moderate growth in total consumption is expected through 2038, driven by strong growth in gas consumption for electric generation and offset by declines in residential growth. The *Base Case* forecasts for Industrial and Commercial demand also align reasonably well with the AEO projections. Note that Table 3 also includes data for 2030, showing the general agreement among the forecasts in the middle of the Forecast Period as well.

Average annual prices from the *Base Case* for selected points are shown in Table 4.

*Table 4. Base Case* Annual Prices *($/MMBtu)*

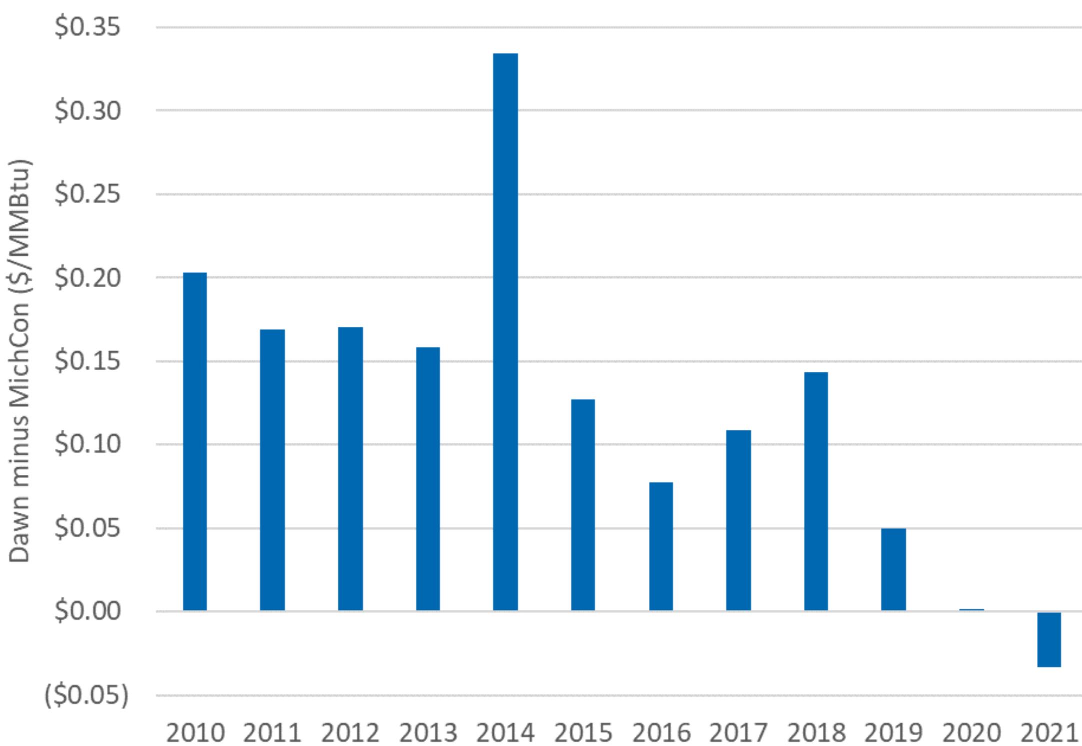
| | Dawn | MichCon | Clarington | Kensington |
|---|---|---|---|---|
| 2022 | $2.65 | $2.68 | $2.19 | $2.35 |
| 2023 | $2.52 | $2.56 | $2.05 | $2.22 |
| 2024 | $2.50 | $2.55 | $2.05 | $2.24 |
| 2025 | $2.59 | $2.63 | $2.06 | $2.27 |
| 2026 | $2.62 | $2.67 | $2.05 | $2.28 |
| 2027 | $2.70 | $2.73 | $2.11 | $2.33 |
| 2028 | $2.79 | $2.83 | $2.19 | $2.41 |
| 2029 | $2.95 | $2.99 | $2.29 | $2.52 |
| 2030 | $3.04 | $3.09 | $2.37 | $2.61 |
| 2031 | $3.18 | $3.22 | $2.46 | $2.72 |
| 2032 | $3.29 | $3.33 | $2.54 | $2.81 |
| 2033 | $3.40 | $3.44 | $2.61 | $2.90 |
| 2034 | $3.52 | $3.55 | $2.69 | $2.99 |
| 2035 | $3.63 | $3.67 | $2.78 | $3.08 |
| 2036 | $3.76 | $3.80 | $2.86 | $3.18 |
| 2037 | $3.88 | $3.92 | $2.95 | $3.28 |
| 2038 | $4.01 | $4.05 | $3.04 | $3.38 |

The Upper Midwest prices, MichCon and Dawn, increase at a higher rate than do the other prices shown, indicating that even though prices will remain low compared to historical levels, regional delivery constraints will continue to create price separation to other areas.

Also noteworthy is the evolving relationship between the MichCon and Dawn prices. Historically, Dawn gas has been priced at a premium to gas at MichCon; however, the *Base Case* forecast indicates an inversion of that relationship. This outlook represents a continuation of recent trends between those prices, whereby the spread has decreased consistently and, recently, reversed. Figure 10 shows the average annual spread between Dawn and MichCon since 2010.[8]

[8] Data for 2021 are a year-to-date average through March 23.

*Figure 10.* Average Annual Spread from Dawn to MichCon[9]




## No Nexus Simulations

In the *No Nexus* case, flows on NEXUS are eliminated while all other factors are held constant. From Michigan's perspective, the result is that access to the lowest priced sources of gas (the Marcellus and Utica shales) is reduced and the market is compelled to import gas from other sources that are either farther away such as the Haynesville Shale, located mostly in Texas and Louisiana, or the Niobara Shale, which is in the Rockies, or from local production from the Antrim Shale, which is nearby but more expensive.

One result of the supply shift is an increase in local prices. Figure 11 shows the average annual change in the MichCon price in the *No NEXUS* case compared to the *Base Case*. On average, the differential is roughly $0.08/MMBtu.

[9] FTI analysis using data from S&P.

*Figure 11.* Change in Annual MichCon Prices

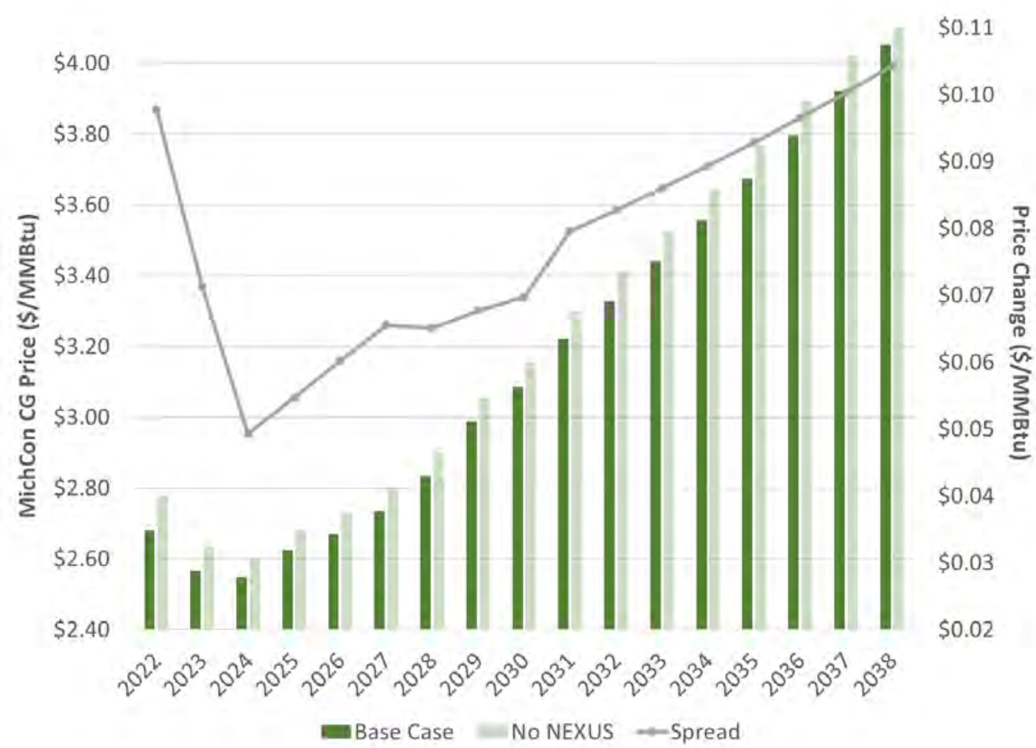
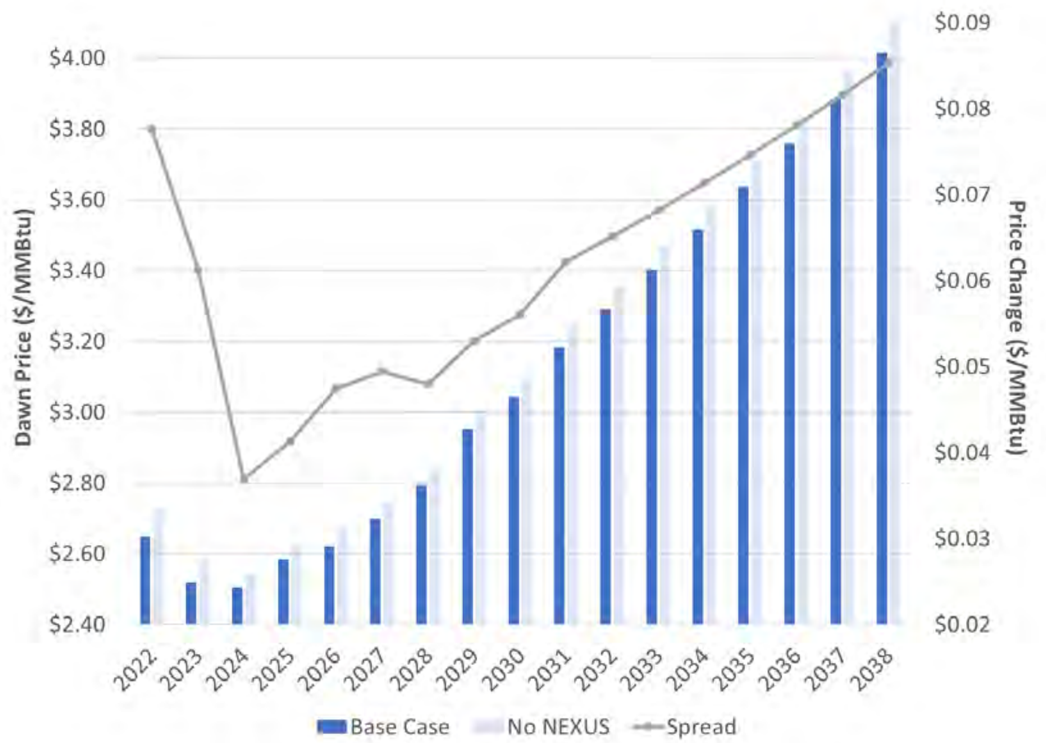



Figure 12 shows a similar comparison for Dawn, where the spread between the *No NEXUS Case* and the *Base Case* is lower, averaging roughly $0.06/MMBtu over the forecast period. Prices at Dawn are less sensitive to the impact from NEXUS because it is farther away from NEXUS receipts and because Dawn is subject to other market influences that may be more pronounced on the Canadian side of the border, including, for example, flows on the TransCanada Pipeline Line ("TCPL") system.

*Figure 12.* Change in Annual Dawn Prices




In some locations, the opposite price response occurs, and prices are higher in the *Base Case*. This is the case in some supply areas, where NEXUS increases demand. For example, Table 5 shows that prices at Dominion South and TGP Z4 200L each increased as a result of NEXUS being placed into service.

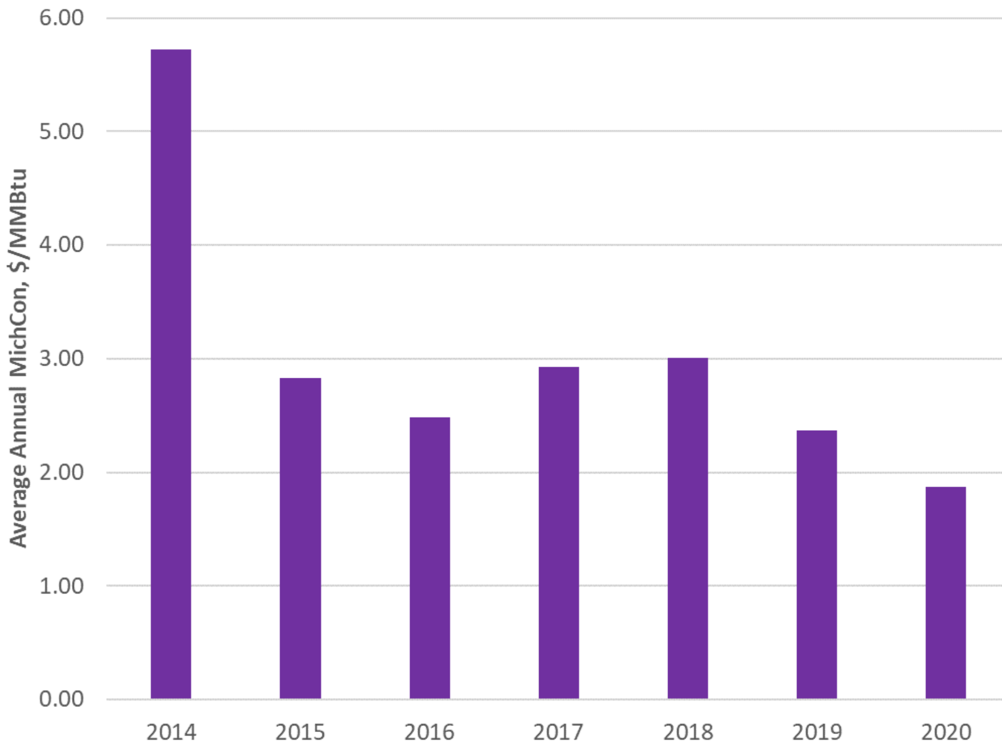
*Table 5.* Average Change (2022-2038) in Selected Prices *($/MMBtu)*

| | ***Base Case*** | ***No NEXUS*** | **Price Change** | **% Change vs. Base** |
|---|---|---|---|---|
| MichCon | $3.16 | $3.24 | $0.08 | 2.5% |
| Dawn | $3.12 | $3.18 | $0.06 | 2.0% |
| Dominion South | $2.23 | $2.19 | ($0.04) | -1.7% |
| TGP Z4 200L | $2.41 | $2.38 | ($0.03) | -1.3% |

### Comparison to Results Reported in the November 2015 Report

These results differ meaningfully from those described in the November 2015 Report. In that study, NEXUS was found to cause a larger difference in delivered prices, which, in turn, created more savings. One reason for the difference – likely the most significant – is the fact that gas prices were higher around the time the November 2015 Report was developed than they are now. For example, the average MichCon prices for 2014 and 2015 were $5.72/MMBtu and $2.83/MMBtu, respectively. By 2020, the average price at MichCon had fallen below $2/MMBtu. Average annual prices since 2014 are shown below.

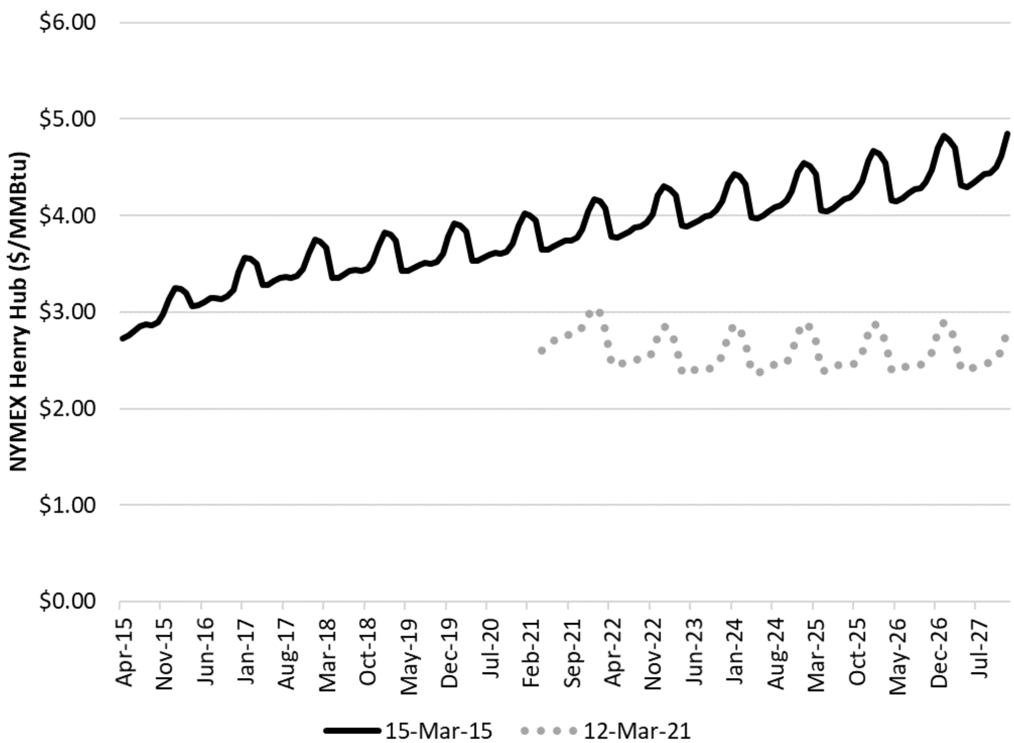
*Figure 13.* Average Annual MichCon Prices, 2014-2020[10]




Expectations for future prices were also considerably higher in 2015 than they are at present. Figure 14 shows the New York Mercantile Exchange ("NYMEX") forward curves for the Henry Hub, historically the benchmark index for North American gas, that settled on March 15, 2015 and on March 12, 2021. The curve from 2015 is considerably higher and indicates that the cost of gas is expected to increase at a rapid pace into the future. For example, the 2021 settlements indicate that the Henry Hub price in 2027, the last year included in both curves, is expected to average $2.58/MMBtu while the 2015 settlements indicate $4.45/MMBtu, more than 75% higher.

[10] Analysis by FTI using data from S&P.

*Figure 14.* NYMEX Henry Hub Futures, 2015 vs. 2021




One implication of the current, lower price environment is that price changes attributable to new infrastructure are likely to be smaller.

Another, closely related reason for the difference in the outlooks presented in the two studies may be the unexpected response to Appalachian gas producers to low prices. Production levels from suppliers in the Marcellus and Utica regions over the last several years have surprised many industry observers, who believed that low prices would cause producers to curtail their output. Instead, production has generally remained strong and although some declines have been observed since the beginning of 2020, they may be attributable to impacts from the COVID-19 pandemic.

Finally, the disposition of supply into Michigan, both historically and in terms of the long-term outlook, has clearly changed. The November 2015 Report indicates that, absent NEXUS, only about a third of the gas brought to Michigan would be from Appalachia, with gas from sources in the west representing the state's largest sources of supply.[11] At the time, that outlook was generally supported by more competitive pricing for gas from the Western Canadian Sedimentary Basin ("WCSB"), from which a significant amount of gas for the Upper Midwest is sourced and delivered via TCPL, the Northern Border system and smaller systems that connect with TCPL, including Alliance and GLGT. More recently, supplies from WCSB have become less competitive compared to shale gas from the mid-Atlantic and also compared to supplies from other areas whose favorable economics have supported recent growth, such

[11] p. 22.

as the Haynesville or Niobara formations or the Permian Basin. It may be the case, then, that when the November 2015 Report was presented to the Commission that NEXUS would be expected to provide a path to Michigan that would allow for the displacement of gas that was considerably more expensive than Michigan's current supplies. Some of the non-Appalachian supplies that Michigan can access, including, for the example, Haynesville gas, may be more expensive than Marcellus and Utica gas, but the difference may be smaller than it was when the November 2015 Report was developed. As a result, the expected impact from NEXUS could be somewhat less than had been expected at that time.

These important differences notwithstanding, the findings described in this document and those described in the November 2015 Report share important consistencies. In particular, the November 2015 Report found that NEXUS was expected to decrease the MichCon price by roughly 3.6%, on average, over its forecast period, a result that generally similar the forecast of a 2.5% reduction that FTI has found in this study. Table 6 shows a comparison.

*Table 6.* Comparison of Results to November 2015 Report, Average MichCon Prices *($/MMBtu)*

| | FTI Study | November 2015 Report |
|---|---|---|
| Base | $3.16 | $5.87 |
| No NEXUS | $3.24 | $6.08 |
| Change | $0.08 | $0.21 |
| % change | 2.5% | 3.6% |

While some of the forecasts described in the November 2015 Report are now inconsistent with current expectations, it is not appropriate to evaluate their accuracy based entirely on hindsight and without context. Market conditions when that study was developed, particularly with regard to the considerably higher spot and forward gas prices, clearly align with a higher price outlook which, in turn, results in higher benefits. Now, with market prices lower, the benefits attributable to NEXUS are decreased. These differences notwithstanding, similarities between the two studies, particularly the expected percentage reductions in delivered prices and the simple fact that both forecasts found NEXUS to provide significant impacts that create ratepayer sayings, may serve to validate both studies while also demonstrating that NEXUS delivers benefits under a wide range of market conditions.

## Calculation of NEXUS Benefits

Benefits attributable to NEXUS accrue in different ways for different customers, depending on whether they hold entitlements on NEXUS, on other systems, or both, among other factors. This section discusses the derivation of the benefits attributable to each of DTE Electric, DTE Gas, and other customers in Michigan from the results of the simulation analyses.

As contract holders, savings for DTE Electric and DTE Gas emerge from their ability to source gas upstream on NEXUS instead of in or closer to Michigan and also from the fact that other purchases are made at reduced prices. The following example illustrates the mechanics of how savings are realized.

The *Base Case* forecast for November 2028 is $2.93/Dth for MichCon and $2.41/Dth for Kensington.[12] The *No NEXUS Case* forecast for the same month is $3.03/Dth for MichCon. That same month, DTE Electric's consumption is expected to be approximately 6.6 million Dth, of which about 2.3 million Dth can be bought at Kensington under Company's NEXUS entitlement. DTE Electric's cost of that gas is therefore $0.62/Dth lower than what it would otherwise have to pay since those purchases would be made at the *No NEXUS* MichCon price had NEXUS had not been built. The cost of gas for the month is further reduced by comparing the MichCon price from the *Base Case* of $2.93/Dth to the MichCon price from the *No NEXUS Case* of $3.03/Dth, resulting in cost savings of about $0.10/Dth for the 4.4 million Dth of expected spot volumes, or $445,000. The fuel charge on NEXUS volumes for the month is 1.26%, a cost of approximately $70,000. For the month, the total savings are greater than the cost of the NEXUS entitlement and fuel costs, and delivered costs are reduced by approximately $213,000.

*Table 7.* November 2028 Savings Calculation Example

| | | | |
|---|---|---|---|
| Demand | Dth | 6,613,337 | *a* |
| Entitlement | Dth | 2,250,000 | *b* |
| Reservation rate | $/Dth | ($0.695) | *c* |
| Contract cost | $ | ($1,563,750) | *d=b*c* |
| | | | |
| MichCon Price (*No NEXUS*) | $/Dth | $3.03 | *e* |
| Kensington Price | $/Dth | $2.41 | *f* |
| Savings | $/Dth | $0.62 | *g=e-f* |
| Savings | $ | $1,400,486 | *h=g*b* |
| | | | |
| Non-contracted Volumes | Dth | 4,363,337 | *i* |
| MichCon Price (*No NEXUS*) | $/Dth | $3.03 | *e* |
| MichCon Price | $/Dth | $2.93 | *j* |
| Savings | $/Dth | $0.10 | *k=e-j* |
| Savings | $ | $444,529 | *l=i*k* |
| | | | |
| Contract Rate | % | 1.26% | *m* |
| Fuel Cost | $ | ($68,371) | *n = b*f*m* |
| | | | |
| **Savings** | **$** | **$212,893** | ***o=d+h+l+n*** |

By repeating this calculation for this month forecast period, FTI determined that for the period 2022-2038, the gas price savings to DTE Electric is approximately $312 million. After accounting for NEXUS entitlement costs of $302 million, the analysis demonstrates that total savings for DTE Electric customers is approximately $11 million. Annual results are shown below:

[12] 1 Dth = 1MMBtu

*Table 8.* DTE Electric Net Savings by Year *($,millions)*

| | Benefits | Contract Costs | Net |
|---|---|---|---|
| 2022 | $12.4 | ($16.5) | ($4.2) |
| 2023 | $14.3 | ($19.0) | ($4.8) |
| 2024 | $12.0 | ($19.1) | ($7.1) |
| 2025 | $14.1 | ($19.0) | ($5.0) |
| 2026 | $15.7 | ($19.0) | ($3.3) |
| 2027 | $16.1 | ($19.0) | ($2.9) |
| 2028 | $16.7 | ($19.1) | ($2.4) |
| 2029 | $18.3 | ($19.0) | ($0.7) |
| 2030 | $18.8 | ($19.0) | ($0.3) |
| 2031 | $20.7 | ($19.0) | $1.7 |
| 2032 | $21.9 | ($19.1) | $2.8 |
| 2033 | $22.7 | ($19.0) | $3.7 |
| 2034 | $23.7 | ($19.0) | $4.6 |
| 2035 | $24.6 | ($19.0) | $5.6 |
| 2036 | $25.7 | ($19.1) | $6.6 |
| 2037 | $20.7 | ($12.4) | $8.3 |
| 2038 | $14.0 | ($6.3) | $7.7 |

The same general approach was followed to estimate benefits for DTE Gas, except that additional steps had to be taken to account for its transportation portfolio by identifying the relevant market index for delivery points associated with each contract. For example, DTE Gas holds a contract with GLGT that specifies delivery points at or near the Emerson meter station near the U.S.-Canada border, where gas is typically valued based on the Emerson, Viking GL ("Emerson") index. Therefore, for the gas that DTE Gas will flow using that contract, the benefit of NEXUS is based on the difference in the Emerson prices in the *Base Case* and *No NEXUS Case*. Table 9 shows the DTE Gas transportation portfolio and the pricing index selected to analyze the benefits for gas flowed under each contract.[13]

[13] DTE Gas holds additional contracts on the ANR system that are intentionally excluded because their cost is recovered via distribution rates.

*Table 9.* DTE Gas Transportation Portfolio *(Dth/d)*

| Pipeline | Qty | Index |
|---|---|---|
| NEXUS - Kensington | 37,500 | Kensington |
| NEXUS - Clarington | 37,500 | Clarington |
| GLGT | 30,390 | Emerson |
| Viking/ANR | 21,000 | Emerson |
| Vector | 20,000 | Chicago CG |
| Panhandle | 65,000 | Panhandle, TX-OK |
| ANR Alliance | 50,000 | Chicago CG |
| ANR SW | 79,000 | ANR, OK |
| ANR Mainline 3 ("ML3")[14] | 60,000 | REX Z3 |

As detailed in the GCR filing, all of these contracts except the one on GLGT expire by 2033. FTI has made the simplifying assumption that each will be renewed at the same terms for the duration of the forecast period. This includes the NEXUS contract, which is assumed to continue to be effective through October 2038 (the end date of the DTE Electric contract). Over that period, the total benefit to DTE Gas is approximately $555 million with net savings of $199 million. Annual totals are shown below.

*Table 10.* DTE Gas Net Savings by Year *($,millions)*

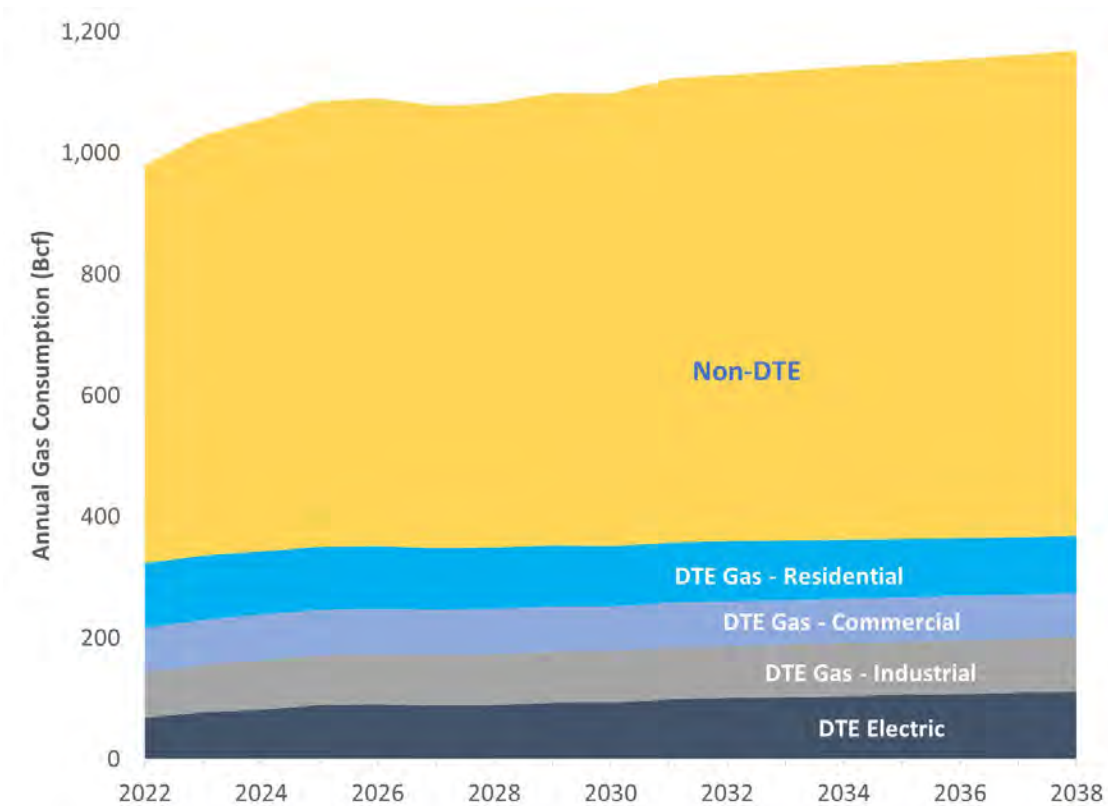
| | Benefits | Contract Costs | Net |
|---|---|---|---|
| 2022 | $33.7 | ($21.1) | $12.6 |
| 2023 | $31.2 | ($21.1) | $10.1 |
| 2024 | $21.5 | ($21.1) | $0.3 |
| 2025 | $23.2 | ($21.1) | $2.1 |
| 2026 | $25.7 | ($21.1) | $4.6 |
| 2027 | $27.3 | ($21.1) | $6.2 |
| 2028 | $28.2 | ($21.1) | $7.0 |
| 2029 | $29.4 | ($21.1) | $8.3 |
| 2030 | $30.3 | ($21.1) | $9.3 |
| 2031 | $34.4 | ($21.1) | $13.3 |
| 2032 | $35.7 | ($21.1) | $14.5 |
| 2033 | $37.0 | ($21.1) | $15.9 |
| 2034 | $38.4 | ($21.1) | $17.3 |
| 2035 | $39.8 | ($21.1) | $18.7 |
| 2036 | $41.4 | ($21.1) | $20.2 |
| 2037 | $42.9 | ($21.1) | $21.8 |
| 2038 | $34.6 | ($17.6) | $17.0 |

[14] The contract for capacity on ANR ML3 each winter, from November through March, only.

In addition to the DTE Utilities, other customers who buy gas in Michigan because their delivered costs are lower than they would be without NEXUS because of the downward pressure the incremental supplies into the market put on clearing prices. This benefits the consumers who buy spot gas priced at a Michigan index and also customers who hedge since using transportation contracts, since over time, reductions in Michigan gas prices should translate to reductions in the cost of pipeline transportation into the region of roughly the same magnitude.

To calculate these benefits, FTI first developed a non-DTE consumption forecast by subtracting the DTE Utilities' consumption from the statewide forecast. The resulting outlook, differentiated between DTE and non-DTE consumption, is shown below.

*Figure 15.* Consumption Outlook by Type




Savings for the non-DTE customers are created by the change in spot prices attributable to NEXUS. FTI used the average of differentials between the *Base Case* and the *No NEXUS Case* for each of Consumers CG, Dawn, Chicago CG, and Emerson. For month, the average reduction in those prices was multiplied by the forecast of non-DTE consumption shown in Figure 15. The results indicate that savings to non-DTE gas customers is expected to total approximately $808 million.

*Table 11.* Non-DTE Savings by Year *($,millions)*

| | Savings |
|---|---|
| 2022 | $55.1 |
| 2023 | $48.2 |
| 2024 | $27.6 |
| 2025 | $31.0 |
| 2026 | $34.5 |
| 2027 | $37.0 |
| 2028 | $37.5 |
| 2029 | $39.7 |
| 2030 | $41.5 |
| 2031 | $49.3 |
| 2032 | $51.8 |
| 2033 | $53.8 |
| 2034 | $55.8 |
| 2035 | $58.0 |
| 2036 | $60.2 |
| 2037 | $62.4 |
| 2038 | $64.8 |

The non-DTE savings are large because they are not offset by any contract costs and because there are so many non-DTE customers. Therefore, on a unit basis, the change in delivered costs these customers realize is small, but because they comprise two-thirds of the entire state, those small savings are multiplied across large amounts of consumption.

Combined across all three customers types, the total benefit attributable to NEXUS over the forecast period is approximately $1 billion.

*Table 12.* Total Benefits by Year (*$, millions)*

| | DTE Electric | DTE Gas | Non-DTE | Total |
|---|---|---|---|---|
| 2022 | ($4.2) | $12.6 | $55.1 | $63.6 |
| 2023 | ($4.8) | $10.1 | $48.2 | $53.5 |
| 2024 | ($7.1) | $0.3 | $27.6 | $20.9 |
| 2025 | ($5.0) | $2.1 | $31.0 | $28.2 |
| 2026 | ($3.3) | $4.6 | $34.5 | $35.8 |
| 2027 | ($2.9) | $6.2 | $37.0 | $40.4 |
| 2028 | ($2.4) | $7.0 | $37.5 | $42.1 |
| 2029 | ($0.7) | $8.3 | $39.7 | $47.3 |
| 2030 | ($0.3) | $9.3 | $41.5 | $50.5 |
| 2031 | $1.7 | $13.3 | $49.3 | $64.3 |
| 2032 | $2.8 | $14.5 | $51.8 | $69.1 |
| 2033 | $3.7 | $15.9 | $53.8 | $73.4 |
| 2034 | $4.6 | $17.3 | $55.8 | $77.8 |
| 2035 | $5.6 | $18.7 | $58.0 | $82.3 |
| 2036 | $6.6 | $20.2 | $60.2 | $87.0 |
| 2037 | $8.3 | $21.8 | $62.4 | $92.6 |
| 2038 | $7.7 | $17.0 | $64.8 | $89.5 |
| Total | $10.5 | $199.4 | $808.3 | $1,018.2 |

## High Demand Scenario

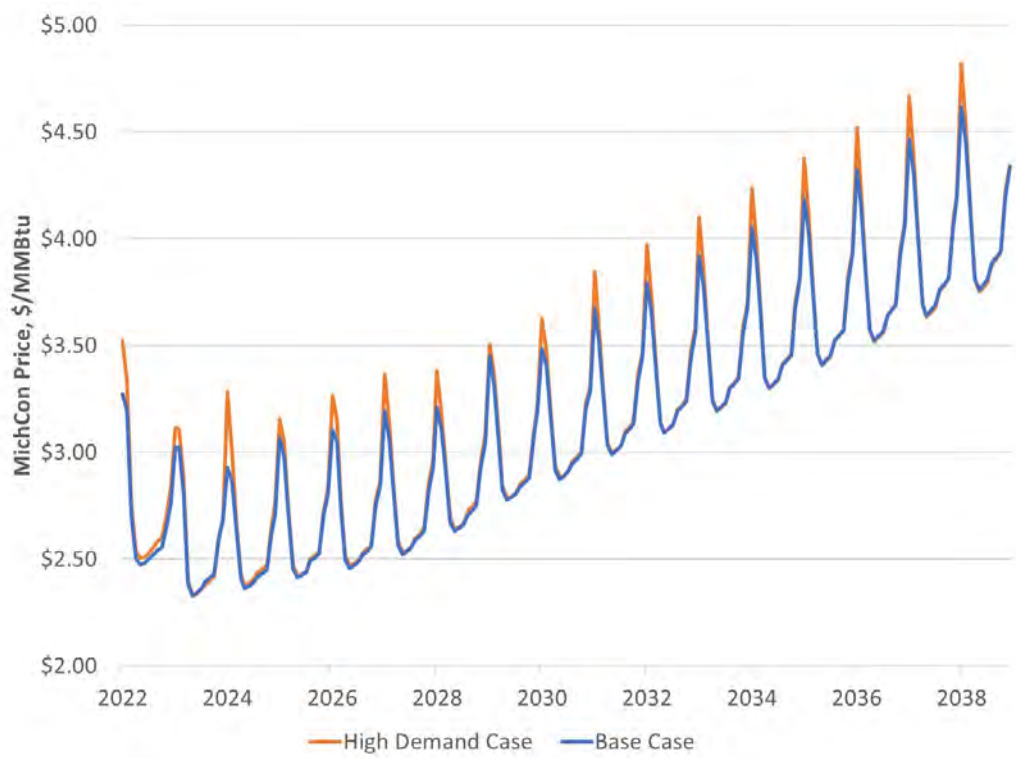
FTI also developed a high demand scenario in which gas demand was increased for the five ENC states based on an analysis of historic Heating Degree Day ("HDD") data. The simulations were executed using this higher demand outlook with and without NEXUS using the same general approach applied to the *Base Case* and the *No NEXUS Case.*

The DTE Utilities provided FTI with weighted average HDD information for the past fifteen years, 2006-2020. Over that period there were an average of 6,490 HDDs per year in DTE's service territory. To develop the adder, FTI identified the five years in that set with the highest HDDs (which are, in order from highest to lowest, 2014, 2007, 2013, 2009, and 2019). Among those five years, HDDs were 8% higher than the overall average. The *High Demand Case* was therefore created by increasing demand in all sectors and in all months throughout the year in the ENC states by that amount while holding all other inputs constant.[15]

Figure 16 shows the MichCon outlook for the *High Demand Case* compared to the *Base Case.* There is a noticeable increase during the coldest winter months, when gas demand and prices are generally highest, with little or no increase during the non-peak months.

[15] The inputs held constant are from the *Base Case*. In other words, this iteration of the *High Demand Case* includes NEXUS.

*Figure 16.* MichCon Price Forecast Comparison




For the period 2022 through 2038, the average increase in the *High Demand Case* over the *Base Case* for January and February is $0.15/MMBtu while the average for the remaining months is $0.02/MMBtu.

Despite the relatively small change in market prices, there is a significant increase in the benefits to Michigan ratepayers attributable to NEXUS under this alternative demand outlook. FTI calculated the benefits in the same manner as described above for the *Base Case.* Doing so involved running the *High Demand Case*, configuring a separate simulation in which NEXUS was excluded but all other variables were held constant, and comparing the results in the same manner as is described above. The result was a sizeable increase in benefits attributable to NEXUS; the value of NEXUS to customers in Michigan increases by about 20% when the higher demand assumption is utilized.

*Table 13. Comparison of NEXUS Benefits Under High Demand Case ($, millions)*

| | Base Demand | High Demand |
|---|---|---|
| Total Benefits | $1,018 | $1,264 |

This finding is significant because it suggests that not only does NEXUS provide a useful hedge against price increases in the future but that the investment in NEXUS may a very attractive upside. The *Base Case* results indicate that NEXUS creates significant savings when prices are low. If it is the case that prices are more likely to increase than decrease for some or all of the forecast period – a reasonable proposition given that gas prices are currently near historic lows – then the NEXUS investment may confer considerable additional value and that potential outcome is offset by very little risk.

## OTHER BENEFITS

In addition to the gas cost reductions calculated under each scenario analyzed in this report, NEXUS provides other important benefits to Michigan ratepayers that are either primarily qualitative or whose calculation is beyond the scope of these analysis. These benefits include, but are not limited to the following:

- **Electric Generation Benefits**. Lower gas prices reduce costs for gas-fired generators in Michigan whether they hold NEXUS entitlements or not. This means, all else equal, that DTE's generators will be called upon to run more often by MISO, and, when they do run, their margins will be greater.
- **Reliability.** The addition of an entirely new path to supply sources reduces the likelihood of a major shortfall that could impact the reliability of the gas or electric systems in the event of an outage or other contingency event on one of the pipelines that serves Michigan.
- **Environmental Benefits.** Secure, economic supplies of natural gas are a necessary precondition for the deployment of new and efficient gas-fired generation, which, in turn, allows for the displacement of coal-fired generation in Michigan and, potentially, elsewhere and also provides an important tool for managing the intermittency of renewable generators being added to the system in increasing amounts.

## CONCLUSIONS

The primary conclusion of this study is that NEXUS will create significant savings for Michigan gas consumers. For the period 2022-2038, FTI expects those savings to exceed $1 billion. If market prices increase in the future, those savings could be even greater.

# APPENDIX 1. GPCM DESCRIPTION

# GPCM® Product Description and Introduction

## 1.0 Purpose

GPCM® is RBAC's GPCM Natural Gas Market Forecasting System™. Originally known as the Gas Pipeline Competition Model, GPCM is a combination software-database system, whose purpose is to enable its users to build models for analysis of natural gas economics, including the sectors of production, transportation, storage, marketing, and sales to distributors and other large customers. GPCM is the latest in a series of systems and models built by Dr. Robert E. Brooks from the mid-1970s through the present. Making use of the latest PC hardware and software technology as well as advanced computational algorithms, it enables analysts to do more at their desktop than has ever been possible in the past using mainframe computers with earlier, similar software tools.

## 2.0 Model Structure

Mathematically, GPCM is a network model. It can be diagrammed as a set of "nodes" and "arcs". Nodes represent production regions, pipeline zones and interconnects, storage facilities, delivery points, and customers or customer groups. The connections between these nodes are called "arcs". They represent transactions and flows. Some of these are supplier deliveries to pipelines, transportation across zones and from one zone to another, transfers of gas by one pipeline to another, delivery of gas into storage, storage of gas from one period to another, withdrawal of gas from storage, and pipeline deliveries of gas to customers.

In general an arc has four input attributes and two output attributes. The inputs are cost (which may depend on transaction volume), a minimum, a maximum, and a loss factor (representing fuel use and miscellaneous losses). The outputs are the amount of the transaction (the flow) and the economic rent associated with the flow. The latter is defined mathematically as the economic value of a unit increase (decrease) in the upper (lower) bound. It generally applies to pipeline transportation and storage capacity and represents the marginal value of increased capacity.

The economic value of a solution to this problem is identified in economic theory to be the sum of producer and consumer surplus. These concepts are defined for price sensitive supplies and demands. We assume that each supply source and each customer has a well-defined supply or demand curve. The forms for these curves can be quite general. GPCM only requires the quantity to decrease with increasing price for demand curves and to increase with increasing price for supply curves.

The objective function for this "equilibrium" solution has been shown by Nobel Prize winning economist Paul Samuelson to consist of three terms: the integral of the demand price function over demand minus the integral of the supply price function over supply and minus the sum of the transportation and storage costs. By dividing the applicable range of possible prices into a number of small steps, we can approximate the integrals in the objective function by linear terms of the form p * delta q, where delta q is the additional demand (or supply) resulting from the small price change. Because of the form of the supply and demand functions and the objective function, each of these terms will be brought into the solution in an economically sensible order to produce an economically efficient, market-clearing solution. That is, the cheaper supplies will be used before more expensive ones and the customers willing to pay more will be served before those willing to pay less. Thus we are able to use a "linear programming" approach to solve a highly non-linear, complex model of market clearing behavior in the natural gas industry.

### 3.0 Transportation and Storage Tariff Structure

In general, each transportation and storage transaction cost is parameterized by five values: a unit demand charge, unit firm commodity charge, unit interruptible commodity charge, a "full discount quantity" (FDQ) and a "zero discount quantity" (ZDQ). The cost model for such transactions assumes that, for a price, some amount of the capacity could be reserved for certain customers. The cost of such capacity reservations will be the unit demand charge times the capacity reserved plus the unit firm commodity charge times the amount actually used. The cost for interruptible service (interruptible commodity charge) will be lower on average than the total cost for firm service, but higher than the firm commodity charge. The model says that if demand for the capacity is higher than the ZDQ, the pipeline will be able to charge the full interruptible rate for transportation. If not then it will have to discount. The amount of the discount in this model is maximal when demand falls to FDQ or lower: then the price of transportation is equal to the firm commodity charge. The discount declines linearly as demand increases from the FDQ up to the ZDQ. For all demand greater than or equal to ZDQ, the price is the full interruptible commodity charge, i.e. no discounting is required.

Storage transactions work the same way. There are three storage transactions: injection, storage, and withdrawal. Injection and withdrawal have the structure just defined. Storage has a simpler structure: a constant unit cost per period, which may be zero. The user may model a situation where gas is transported to a storage location on one rate schedule, injected and withdrawn under another, and delivered to another location under a third. The user may also model a "bundled" structure involving movement from one location to the storage location and then downstream to yet a third, all under the same rate structure.

Marketers are modeled as a single undifferentiated sector in GPCM. This sector is assumed to mediate all transactions in the model. It is the sector which makes the market by linking gas supply to gas demand through the pipeline and storage system.

The bulk of the economic rent due to capacity restrictions is generally distributed to the marketing sector. The assumption is basically that the marketers are able to buy at market conditions, sell at market conditions, and acquire transportation at prices fixed in the short term. Therefore, short term economic rents will not be acquired by the pipeline sector and will go to the marketing sector. Suppliers and customers owning Firm Transportation earn the remainder of these rents. Their rents may be earned by reselling their capacity to others or by using the F/T themselves.

### 4.0 User Interface

The user interface is the principal analysis tool contained in the GPCM system. It consists of a set of queries, macros, modules, forms, and reports contained in a Microsoft Access file. The user interacts with this interface through Access "Forms". Forms contain data from the database and controls such as button for causing actions to be done. The data displayed in forms is stored in database tables in a separate Access file. These tables are "attached" to the user interface so that they can be viewed and modified by the analyst.

## 5.0 Database

The database file consists of a number of data tables for input and output. The data inputs are primarily of three types: tables representing the basic entities of the model (suppliers, supply regions, customers, demand regions, pipeline zones, storage facilities), tables relating these entities representing the structural linkages in the model (the arcs), and the quantitative data representing supplies, demands, tariffs, capacities, fuel use, etc. The GPCM user typically populates the database via Windows clipboard copy-paste operations from Excel or other spreadsheets. Alternatively, the user can utilize GPCM's built-in data import routines.

## 6.0 RBAC Network Optimizer

RBAC Network Optimizer is a specialized linear programming algorithm designed specifically to solve network models such as that used in GPCM™. In benchmarking tests on a large variety of such problems, it has proven to be world class in speed and functionality. RBAC Network Optimizer has been extended to handle the linearized approximations of non-linear supply, demand, and transportation cost functions required for the solution of the GPCM model.

## 7.0 Outputs

GPCM contains powerful and flexible tabular and graphical output capabilities. In addition the entire solution can be exported to an Excel spreadsheet for further analysis and reporting.

Following is a list of the pre-packaged screen and hardcopy reports available in GPCM:

- Results Summary / Detail
- Pipeline Usage Summary
- Supplier Deliveries Detail / Summary
- Customer Receipts Detail / Summary
- Supplier Revenue Report
- Customer Cost Report
- Transport Results Detail
- Transport Zone Prices
- Transport Zone Basis
- Interconnect Basis
- Transport Revenue
- Storage Revenue
- Transport Zone Utilization
- Transport Link Utilization
- Storage Utilization
- Storage Balance

Report 9 allows the user to find the basis (market price spread) between any two pipeline zones identified in the model in any period of the scenario. The report has a graphical capability which allows the user to produce a time series plot of the basis forecast over the forecast horizon of the case.

The Results Summary Report is an aggregate report of the gas and dollar flows among the various sectors of the gas industry. It shows the forecast aggregate average supply price, average unit return to the marketing sector, average transportation and storage cost per unit delivered, and average cost to customers represented in the model. There is also a graphical routine which allows the user to produce histograms comparing any of the elements of the case summary report for various cases.

Finally, GPCM has a general purpose graphing capability the analyst can use to plot time series of inputs and / or outputs either one at a time or overlayed against each other. For example, the analyst could plot the time series of market clearing prices in two different regions in the same scenario or in multiple scenarios in order to get a visual perspective on their relative values.

## Related Offerings from RBAC

- GPCM Daily™ for Intra-Month Stress Testing
- GPCM-PMI™ Power Model Interface
- Gas4Power®
- GPCM Viewpoints® on Natural Gas
- G2M2® Global Gas Market Modeling System™
- NGL-NA® North American Natural Gas Liquids Market Model

## Contracts and Administration

**For additional information about GPCM® and any other RBAC product, contact James Brooks directly at (281) 506-0588 ext. 126 and visit www.rbac.com.**

**STATE OF MICHIGAN**

**BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In the matter of the application of | ) | |
| **DTE GAS COMPANY** for reconciliation of | ) | |
| its gas cost recovery plan (Case No. U-20543) | ) | Case No. U-20544 |
| for the 12 months ended March 31, 2021. | ) | |
| ___________________________________________ | ) | |

**PROOF OF SERVICE**

STATE OF MICHIGAN )
) ss.
COUNTY OF WAYNE )

ESTELLA R. BRANSON, states that on the June 29, 2021, she served a copy of the DTE Gas Company's Application for Gas Cost Recovery Reconciliation and Direct Testimony and Exhibits of Witnesses, Lucian Bratu, Timothy J. Krysinski, Eric P. Schiffer, Gandolfo LoRe, and Matthew J. DeCourcey in the above referenced matter, via electronic mail upon the persons listed on the attached service list.

Estella R. Branson Digitally signed by Estella R. Branson Date: 2021.06.29 16:22:18 -04'00'

ESTELLA R. BRANSON

**SERVICE LIST**
MPSC Case No. U-20544

**MICHIGAN ATTORNEY GENERAL**
Joel King
525 W. Ottawa Street
P.O. Box 30755
Lansing, MI 48909
KingJ38@michigan.gov

**MICHIGAN PUBLIC SERVICE COMMISSION STAFF**
Amit T. Singh
Michael J. Orris
Benjamin J. Holwerda
7109 W. Saginaw Hwy., 3rd FL
Lansing, MI 48917
singha9@michigan.gov
orrism@michigan.gov
holwerdab@michigan.gov

**RESIDENTIAL CUSTOMER GROUP**
Brian W. Coyer
Don L. Keskey
University Office Place
333 Albert Avenue, Suite 425
East Lansing, MI 48823
bwcoyer@publiclawresourcecenter.com
donkeskey@publiclawresourcecenter.com