

CONFIDENTIAL VERSION

# Management Review Audit of Black Hills Nebraska Gas, LLC d/b/a Black Hills Energy

## Report to the Nebraska Public Service Commission

Prepared by Bates White, LLC

August 28, 2023

**BATES  
WHITE**  
ECONOMIC CONSULTING

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## Abbreviations

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AMA	asset management agreement
BHSC	Black Hills Service Company
Dth	dekatherm
FERC	Federal Energy Regulatory Commission
GSCA	gas supply cost adjustment
HDD	heating degree day
ICE	Intercontinental Exchange
IRP	integrated resource plan
MDQ	maximum daily quantity
MMBtu	metric million British thermal unit
NAESB	North American Energy Standards Board
NGPL	Natural Gas Pipeline Company of America
NNG	Northern Natural Gas Pipeline
NOAA	National Oceanic and Atmospheric Administration
NYMEX	New York Mercantile Exchange
RFP	request for proposal
TIGT	Tall Grass Interstate Gas Transmission
VaR	Value at Risk
WACOG	weighted average cost of gas

## I. Introduction and executive summary

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### I.A. Background, scope, and objectives of this audit

Bates White Economic Consulting (“Bates White”)<sup>1</sup> was retained by the Nebraska Public Service Commission (“the Commission”) to perform a management audit of fuel purchases by Black Hills Nebraska Gas, LLC d/b/a Black Hills Energy (“Nebraska Gas”) for the period January 1, 2020 to present (“Audit Period”). This report provides the results of our audit (“Audit Report”).

The scope of Bates White’s audit is found in the Nebraska Public Service Commission Application No. NG-119<sup>2</sup> (“Docket NG-119”), pursuant to Nebraska Revised Statute § 66-1854 (“the Statute”).<sup>3</sup> Specifically, the Statute notes that “[o]nce annually, the Commission may initiate public hearings, upon complaint, to determine whether the gas supply cost adjustment schedule of a jurisdictional utility reflects the costs of the utility’s gas supply and whether such costs were prudently incurred and to reconcile any amounts collected from ratepayers with the actual costs of gas supplies incurred by the utility.”<sup>4</sup> The Commission notes that it “is not restricted to the filing of a formal complaint in order to review [gas supply cost adjustments].”<sup>5</sup>

The Commission chose to conduct an informal review of Nebraska Gas’ gas supply cost adjustment (“GSCA”). The informal review was conducted by the Commission’s consultant. For the management audit, Bates White served as the Commission’s consultant.

Bates White’s scope of work included the following items:

1. A review and description of Black Hills’ approach to natural gas procurement and hedging. This would necessarily include:
  - a. The procurement and hedging objectives, such as stabilization of customer costs consistent with market prices, portfolio target hedge percentages, hedge effectiveness calculations (e.g., how well a hedge contract protects the utility and customers from changes in gas prices), and any other utility objectives.
  - b. How the procurement and hedging approach is implemented. We would determine the organizational structure as it relates to the procurement and hedging processes, the roles

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<sup>1</sup> Bates White is an economic consulting firm offering services to law firms, Fortune 500 companies, and government agencies. Founded in 1999 and headquartered in Washington, DC, we have been recognized by *The Washington Post* as a Top Workplace, named a Top 50 Consulting Firm by Vault, and cited as a Top 21 Economics Firm by Global Competition Review.

<sup>2</sup> Before the Nebraska Public Service Commission, “Order Opening Docket and Initiating Review Notice of Assessment,” Application No. NG-119, March 7, 2023. (“Docket NG-119”)

<sup>3</sup> Nebraska Revised Statutes, Chapter 66 – Oil, Fuels, and Energy, 66-1854 – Cost of gas supply; effect on rate schedules; procedure. (“Statute”)

<sup>4</sup> Statute, ¶ 4.

<sup>5</sup> Docket NG-119, p. 2.

and individuals responsible for the work, how the process works on a day-to-day basis, the governing documents for the process and how they are maintained and disseminated, and how the process incorporates use of competition among potential suppliers.

- c. Black Hills' internal controls, including its risk management practices. This would include a review of allowable contract types/hedging instruments, methods for mitigating certain risks (e.g., counterparty risk, credit risk), and the utility's processes for reviewing potential transactions.
2. A high-level assessment of the processes identified in (1). This high-level assessment would be limited to initial insights and conclusions we would derive in our review and would not necessarily include detailed insights from best practices in other jurisdictions or in-depth review of the utility's shortcomings.
3. A review and description of the results of the procurement approach during the Audit Period, and whether and how the procurement results met the utility's stated objectives. This would include general descriptions of overall transaction volume, prices, costs, and counterparties, as well as overall general hedging results.
4. A high-level assessment of the results identified in (3). This high-level assessment would be limited to general insights on the overall data and would not review in detail individual transactions or contracts with suppliers and financial counterparties.

A separate entity is performing a Financial Audit of Nebraska Gas concurrently. Their audit includes:

1. Review of all gas supply costs for the Audit Period
2. Review of all costs for transportation and storage related to gas procured
3. Review all Gas Supply Cost Adjustment filings and calculations for the Audit Period, including allocation of costs, if any
4. Determine how contract price and volumes are allocated among jurisdictions
5. Trace gas costs to general ledger
6. Trace revenues to general ledger
7. Trace Gas Supply Cost Adjustment to customers' bills (sample bills)
8. As it relates to some items above, conduct transaction sampling to trace individual transactions from their origin (payments to suppliers, etc.) to their recognition and recovery in rates.

Notably, our scope of work did not include review, assessment, or audit of any areas outside of gas supply and transportation procurement, planning, and hedging, such as reliability or operations. Further, while we sampled Audit Period transactions, we did not review every transaction in the Audit Period. Moreover, we wish to emphasize that our scope of work included multiple "high-level" assessments of Black Hills' processes and results, but not a detailed review of these processes and results. This degree of review was specified by the Commission in engaging Bates White.

## I.B. About Black Hills Nebraska Gas

Nebraska Gas is a wholly owned subsidiary of Black Hills Corporation, an investor-owned electric and natural gas utility headquartered in Rapid City, South Dakota.<sup>6</sup> Black Hills Corporation has a market capitalization of over \$4 billion and serves over 1.3 million electric and natural gas customers across Arkansas, Colorado, Iowa, Kansas, Montana, Nebraska, South Dakota, and Wyoming.<sup>7</sup>

As of 2022, Nebraska Gas services over 300,000 retail customers in 319 communities throughout Nebraska.<sup>8</sup> The Nebraska Gas service territory is divided into five Rate Areas. Rate Areas 1, 2, and 3 are entirely in Nebraska and shown in Figure I-1 below. Rate Area 1 includes communities like Bellevue, Plattsmouth, and La Vista. Rate Area 2, the largest by population, encompasses Lincoln, Cheney, and Walton. Rate Area 3 is the largest by area of the Rate Areas, but the smallest by population.<sup>9</sup> Rate Area 4 includes agricultural and other high-volume customers geographically located in Rate Areas 1-3, while Rate Area 5 encompasses the western two-thirds of Nebraska.<sup>10</sup> Our audit addressed Rate Areas 1-3 only. Rate Area 4 customers are not subject to Commission jurisdiction<sup>11</sup> and Rate Area 5 customers are served by third party suppliers under the Choice Gas Program.<sup>12</sup> Nebraska Gas provided us pipeline contracts with three pipelines: Tall Grass Interstate Gas Transmission (“TIGT”), Northern Natural Gas (“NNG”), and Natural Gas Pipeline Company of America (“NGPL”).<sup>13</sup>

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<sup>6</sup> S&P Capital IQ, “Black Hills Corporation,” Company ID 4010420. © 2023 S&P Global Market Intelligence (and its affiliates, as applicable) (individually and collectively, “S&P”). Reproduction of any information, data or material, including ratings (“Content”) in any form is prohibited except with the prior written permission of S&P. S&P does not guarantee the accuracy, adequacy, completeness, timeliness or availability of any Content and is not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, or for the results obtained from the use of such Content. In no event shall S&P be liable for any damages, costs, expenses, legal fees or losses (including lost income or lost profit and opportunity costs) in connection with any use of the Content. A reference to a particular investment or security, a rating or any observation concerning an investment that is part of the Content is not a recommendation to buy, sell or hold such investment or security, does not address the sustainability of an investment or security and should not be relied on as investment advice. Credit ratings are statements of opinions and are not statements of fact.

<sup>7</sup> S&P Capital IQ, “Black Hills Corporation,” Company ID 4010420.

<sup>8</sup> Request PSC-3-1 CONFIDENTIAL Nebraska Service Areas Map.

<sup>9</sup> Nebraska Natural Gas Rate Tariff, Black Hills Gas, LLC d/b/a Black Hills Energy, Filed with the Nebraska Public Services Commission, effective September 1, 2020, Sheet No. 20.

<sup>10</sup> Nebraska Natural Gas Rate Tariff, Black Hills Gas, LLC d/b/a Black Hills Energy, Filed with the Nebraska Public Services Commission, effective September 1, 2020, Sheet Nos. 20-22.

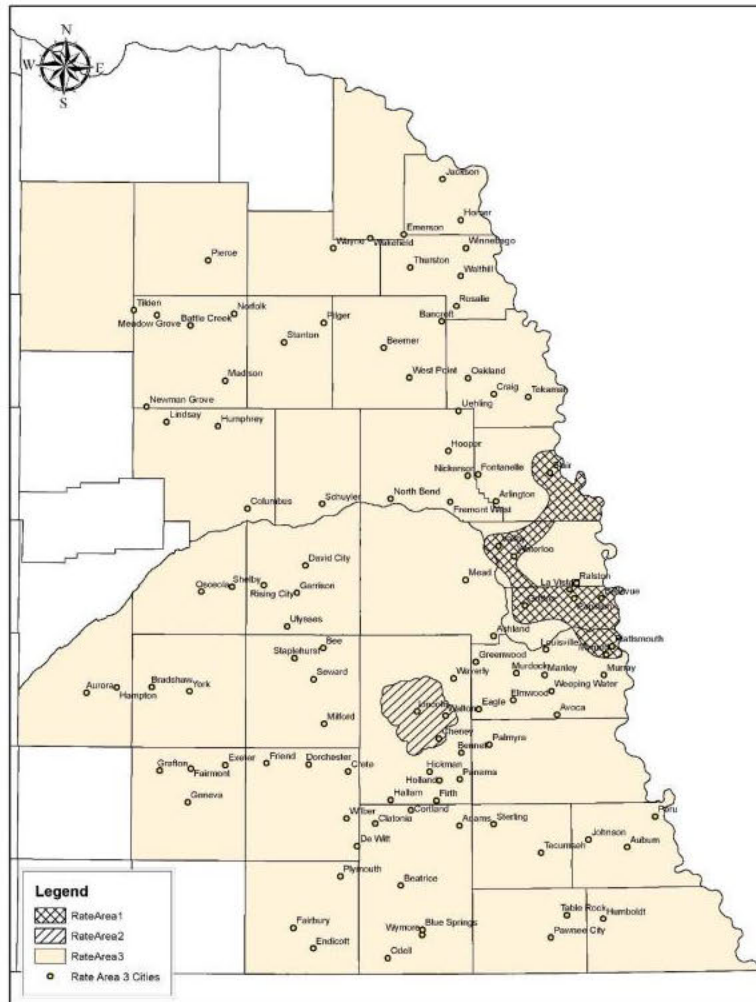
<sup>11</sup> 2016 Nebraska Revised Statutes Chapter 66 - OILS, FUELS, AND ENERGY 66-1810 Service to high-volume ratepayers, agricultural ratepayers, and interruptible ratepayers; jurisdictional utility; powers.

<sup>12</sup> Black Hills Nebraska Gas, LLC d/b/a Black Hills Energy, Nebraska Natural Gas Tariff, Filed with the Nebraska Public Service Commission, available at: [https://www.blackhillsenergy.com/sites/blackhillsenergy.com/files/ne\\_consolidated\\_tariff1.pdf](https://www.blackhillsenergy.com/sites/blackhillsenergy.com/files/ne_consolidated_tariff1.pdf).

<sup>13</sup> See attachments provided in IR-PSC-2.



Figure I-1: Nebraska Gas, LLC Rate Areas<sup>14</sup>



In 2022, Nebraska Gas sold over 17 million dekatherms (“Dth”) of natural gas. The quantities of gas sold and purchased from 2020-2022 is shown in Figure I-2.

Figure I-2: Nebraska Gas quantities of natural gas sold and purchased, 2020-2022<sup>15</sup>

Y a	Sa es Dth)	cha es (D h)
2020	16,597,282	16,470,117
2021	16,280,120	16,485,487
2022	17,828,793	19,462,290

<sup>14</sup> Nebraska Natural Gas Rate Tariff, Black Hills Gas, LLC d/b/a Black Hills Energy, Filed with the Nebraska Public Services Commission, effective September 1, 2020, Sheet No. 25.

<sup>15</sup> Response to IR-PSC-3 Spreadsheets.

## I.C. Our methodology and process

Bates White's approach to the audit was to compile a record of information obtained from Nebraska Gas through formal data requests, web-based interviews, web-based presentations, web-based sensitive document review, and conference calls. We issued formal data requests, reviewed numerous transactions, and conducted numerous conference calls and interviews with key personnel at Nebraska Gas, including management and operations personnel that are responsible for forecasting and scheduling, gas supply, and risk management. Our report's findings, conclusions, and recommendations are based on that record of information.

We focused our review on the natural gas procurement and hedging processes, practices, and procedures of Nebraska Gas. We did not audit Nebraska Gas' operations outside of its natural gas procurement and hedging processes, nor its compliance with reliability or cybersecurity standards.

We note that Nebraska Gas remained cooperative and responsive throughout the audit process. Nebraska Gas accommodated our requests, including to interview certain employees, review Nebraska Gas' models and forecasts, and receive countless contracts, reports, invoices, and other forms of supporting documentation requested throughout the audit process. Nebraska Gas also used a secure document sharing platform (SharePoint) to allow for efficient sharing of documents that served as a reliable record of documents provided to date throughout the process.

## I.D. Report structure

Our report proceeds as follows. We have four substantive chapters, each addressing a different aspect of our scope of work and Nebraska Gas' procurement and hedging activities:

- Chapter II – Organization, staffing, and controls
- Chapter III – Planning and forecasting
- Chapter IV – Procurement
- Chapter V – Hedging

Each chapter follows the same structure. Each begins with the Findings section, which contains our factual records, evidence, and analysis. This section is always the longest of each chapter, as it serves as the factual basis for the next two sections. The next section is the Conclusions section, which includes our distilled deductions and judgments on Nebraska Gas' procurement and hedging activities during the Audit Period. This section is particularly important for readers to review, as it provides our view of what Nebraska Gas is doing well and how it can improve. Last is the Recommendations section, which contains our action items for Nebraska Gas to address to improve outcomes for its customers.

## I.E. Summary of key conclusions and recommendations

Below are nine recommendations. To provide some context for these recommendations, we include the directly related conclusion(s) on which the recommendations are based. To fully understand our basis for these recommendations, please refer to the full respective chapters for our complete findings.

### II – Organization, Staffing, and Controls

- **Conclusion II-6:** The Aether Report is a useful document that provides reasonable recommendations worthy of full consideration by Black Hills. **(Recommendation 2023-1)**
  - **Recommendation 2023-1:** Black Hills complete its consideration of the Aether Report recommendations and seek to implement those that are identified as in customers’ interest.

### III – Planning and Forecasting

- **Conclusion III-4:** BHSC’s winter planning assumes a winter that is one standard deviation colder than normal. Typically, natural gas distribution companies define a “design winter” as the coldest winter for which they plan. Many natural gas distribution companies define a “design winter” as the coldest winter actually experienced over a 30- or 40-year period. **(Recommendation 2023-2)**
  - **Recommendation 2023-2:** Black Hills should assess the definition and implementation of a “design winter” as the coldest winter for which they plan, using a long-term historical data set (i.e., at least 30 years of historical data) to the extent it is colder than its current planning standard.
- **Conclusion III-6:** Black Hills could benefit from implementation of an integrated resource planning process. Given the current market and legislative forces at play, we include a recommendation regarding Black Hills’ consideration of an IRP process for Nebraska Gas, its overall gas distribution utility division, or both. **(Recommendation 2023-3)**
  - **Recommendation 2023-3:** Black Hills should consider implementing an integrated resource planning process for Nebraska Gas, its gas utility division, or both, to determine risks, benefits, and costs of future scenarios (e.g., changes in law, technological/resource breakthroughs (i.e., hydrogen), high gas prices, low gas prices, etc.).

### IV – Procurement

- **Conclusion IV-13:** Overall, we observed evidence that BHSC’s process reasonably considers relevant variables in determining when to dispatch its storage supply resources. We did not discover, however, any formality in the process. For example, an analysis of the coldest expected remaining winter could provide guidance on whether additional (typically) less expensive storage

gas can be dispatched in lieu of dispatching other supply services. While we do not doubt BHSC's expertise in making these assessments, it may help to codify that knowledge and best practices into guidelines for BHSC employees in determining the dispatch of storage supplies. **(Recommendation 2023-4)**

- **Recommendation 2023-4:** Black Hills should consider formalizing and codifying its process for determining its storage injection and storage withdrawal timing and volume levels.

## V – Hedging

- **Conclusion V-5:** BHSC's precise approach to hedging Nebraska Gas' exposure to natural gas prices differs by Rate Area, targeting █████ of the forecasted base case requirement for Rate Areas 1 and 2 and █████ of the forecasted base case requirement for Rate Area 3 due to differences in the availability of storage in the respective Rate Areas. The greater the target hedge percentage, the less volatile Nebraska Gas' costs (and customer rates) will be (though they will incur additional hedging costs). Given (a) the importance of hedge targets, (b) BHSC's consultant's recent finding that different hedge targets by Rate Area may raise equity concerns in the future, and (c) a review of the adequacy of the target hedge percentages were expressly not included in this audit scope and would necessarily require an assessment of the customer load profiles and weather sensitivity, we include a recommendation that future audits include a complete assessment of the specific hedge targets pursued by Nebraska Gas. **(Recommendation 2023-5)**
  - **Recommendation 2023-5:** Future audits of Nebraska Gas should include in its work scope a complete assessment of the target hedge percentages.
- **Conclusion V-8:** BHSC has sought to secure put options from the same counterparties from which it is receiving physical, First-of-the-Month Index or fixed price gas. BHSC explained that suppliers have been hesitant to provide such an arrangement. Pursuit of such options is reasonable, though may be more likely offered by counterparties specializing in such products, such as financial counterparties. **(Recommendation 2023-6)**
  - **Recommendation 2023-6:** In pursuing put and call options to hedge exposure to physical supply contracts, BHSC should consider contracting with counterparties that specialize in such products, such as financial counterparties.
- **Conclusion V-9:** BHSC's use of financial derivative contracts (Henry Hub futures and call options) is reasonable. The process may be improved by also hedging basis risk. BHSC has indicated it is in their plans for 2023-2024. **(Recommendation 2023-7)**

- **Recommendation 2023-7:** Black Hills should seek to hedge natural gas supply basis risk in its hedging activities, with due consideration given to cost-effectiveness and availability of suitable hedging instruments.
- **Conclusion V-14:** BHSC’s hedging program would also be judged by its impact on portfolio volatility, not only cost. To do so would require a volatility measure. One such measure is “Value at Risk,” or “VaR,” which allows for an assessment of downside risk of a portfolio of assets. **(Recommendation 2023-8)**
  - **Recommendation 2023-8:** Black Hills should consider use of a volatility measure to assess the effectiveness of its hedging activities.
- **Conclusion V-15:** Relying on typically lower summer prices for its storage injections is a reasonable strategy. There are instances in the past, however, where settled summer spot prices during some months exceeded settled winter spot prices. The most recent period where this occurred was the summer of 2022. While these conditions may not occur frequently, there may be opportunities to mitigate this exposure in the future for little or no cost. **(Recommendation 2023-9)**
  - **Recommendation 2023-9:** Black Hills should consider alternatives to a strict adherence to relying on non-hedged summer volumes for its storage injections.

## II. Organization, Staffing, and Controls

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### II.A. Findings

#### II.A.1. Organization

As noted above, Black Hills Nebraska Gas, LLC is an indirect, wholly-owned subsidiary of Black Hills Utility Holdings, providing natural gas services to customers in Nebraska and doing business as Black Hills Energy. In this report, we refer to this entity as “Nebraska Gas.” Black Hills Utility Holdings, Inc., a wholly-owned subsidiary of Black Hills Corporation, includes other natural gas and electric regulated gas utilities doing business as Black Hills Energy in Arkansas, Colorado, Iowa, Kansas, and Wyoming. Each distribution utility under the Black Hills Utility Holdings umbrella owns, constructs, operates, and maintains physical distribution assets involved in serving its respective customers.<sup>16</sup> Each of the Black Hills Energy electric or natural gas utility affiliates are regulated by the governing public utilities or service commission located within that respective state.

Gas planning, purchasing, contracting, and hedging is the responsibility of Black Hills Service Company (“BHSC” or “Service Company”), d/b/a Black Hills Energy. BHSC conducts its operations on behalf of all of the regulated distribution utilities, including Nebraska Gas. BHSC provides these services pursuant to a Service Agreement, which specifies the services, rates, terms, and conditions for the provision of these services to Nebraska Gas.<sup>17</sup> The Service Agreement references the Black Hills Company Cost Allocation Manual, which contains the allocation of costs to be borne by Nebraska Gas and, ultimately, its customers.<sup>18</sup>

BHSC is responsible for the following tasks on behalf of Nebraska Gas and the other distribution utilities: (1) natural gas forecasting, nominations, and gas load control; (2) natural gas portfolio management; (3) gas supply contracts; (4) gas storage capacity; (5) interstate pipeline transportation agreements; (6) financial derivative transactions; and (7) working with Nebraska Gas and other distribution utility subsidiaries for supply chain, accounting, risk management, curtailment, system expansion, regulatory proceedings, and other areas requiring BHSC support.<sup>19</sup> BHSC has three regional offices across Black Hills’ Corporation’s footprint: the “Northern” region, which includes Nebraska Gas, is headquartered in Council Bluffs, Iowa; the “Southern” region is in Fayetteville, Arkansas, and the “Western” Region is in Denver, Colorado.<sup>20</sup> We identified evidence of the benefits of the use of BHSC as a centralized entity conducting its operations on behalf of all of the regulated utilities, which we discuss elsewhere in this

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<sup>16</sup> Notes from May 22, 2023 call.

<sup>17</sup> Service Agreement between Black Hills Nebraska Gas, LLC and Black Hills Service Company, January 1, 2020 (“BHSC Service Agreement”).

<sup>18</sup> BHSC Service Agreement, page 1.

<sup>19</sup> Black Hills Nebraska Gas, LLC d/b/a Black Hills Energy, “Gas Purchasing Overview,” presented May 22, 2023 (“May 22 Presentation”), slide 12.

<sup>20</sup> Notes from June 12, 2023 call.

report. We also confirmed through interviews that employees in the Northern region communicate with employees in the other BHSC regions to discuss market conditions and best practices.<sup>21</sup>

## II.A.2. Staffing

As of 2018, Black Hills Corporation employs approximately 2,880 individuals, 17% of which (or about 500) are located in Nebraska.<sup>22</sup> Nebraska Gas employs 376 individuals.<sup>23</sup> The Gas Supply & Transportation Services group for the Northern region at BHSC consists of approximately 30 employees.<sup>24</sup> We interviewed several employees and found each to be knowledgeable about their roles and having significant, relevant experience.

Employees receive regular training related to their roles. Such training includes annual training for compliance with Black Hills Energy's formal policies and procedures, such as training on standards of conduct for gas supply employees, safety training, and risk management training.<sup>25</sup> Employees also described one-on-one training when starting up in new roles.<sup>26</sup>

BHSC has faced staffing challenges since 2019 and the onset of the COVID-19 pandemic. These challenges were exacerbated by the experience of many employees during and in the aftermath of Storm Uri in February 2021,<sup>27</sup> which greatly disrupted natural gas markets in the U.S. and led to record high prices.<sup>28</sup> BHSC explained that since 2019, attrition rates at the organization are at a record high, which has led to lower staffing levels.<sup>29</sup> Replacing lost workers has also been challenging. With the onset of remote working in the wake of the COVID-19 pandemic, many otherwise-qualified workers are not willing to relocate.<sup>30</sup> Additionally, prospective employee salary expectations have increased with inflation.<sup>31</sup> To combat these challenges, BHSC has taken reasonable steps. BHSC has conducted cross-training for existing employees to leverage existing talent and skill sets, allowing for increased work force flexibility. BHSC has also begun recruiting from other industries trained in logistics management, such as shipping firms.<sup>32</sup>

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<sup>21</sup> Notes from June 12 and June 22, 2023 calls.

<sup>22</sup> Black Hills Corporation, "Our Team," 2018, <https://www.blackhillscorp.com/about-black-hills-corporation/corporate-responsibility-report/our-team>.

<sup>23</sup> Request PSC-3-1 CONFIDENTIAL Nebraska Service Areas Map, slide 1.

<sup>24</sup> Request PSC-3-1 CONFIDENTIAL BH Gas Supply Org Chart. See also notes from June 22, 2023 call.

<sup>25</sup> Notes from June 12 and June 22, 2023 calls.

<sup>26</sup> Notes from June 12 and June 22, 2023 calls.

<sup>27</sup> National Weather Service, "Historic Winter Outbreak February 11-20, 2021," <https://www.weather.gov/hgx/2021ValentineStorm>.

<sup>28</sup> Houston Advanced Research Center, "Natural Gas Impacts," *Winter Storm Uri's Impacts & Pathways to Resilience in Texas*, 2021, [https://experience.arcgis.com/experience/cc48fcfebf4e414b99b3d18f86c72c27/page/Natural-Gas-Pricing/?views=view\\_7](https://experience.arcgis.com/experience/cc48fcfebf4e414b99b3d18f86c72c27/page/Natural-Gas-Pricing/?views=view_7).

<sup>29</sup> Notes from June 22, 2023 call.

<sup>30</sup> Notes from June 22, 2023 call.

<sup>31</sup> Notes from June 22, 2023 call.

<sup>32</sup> Notes from June 22, 2023 call.

## II.A.3. Risk management

BHSC's natural gas supply and transportation procurement activities expose it to a variety of risks. Prudent utilities manage those risks, such as counterparty, credit, market, regulatory, and currency risks through well-defined processes, documentation, and organizational structures. BHSC uses an approach to risk management that is industry standard and should be effective in managing common utility risks. We also identified no material concerns related to implementation of risk management policies during the Audit Period.

### II.A.3.a. Risk Management Approach, Policies, and Documents

Black Hills Corporation ("Black Hills") uses an enterprise approach to risk management. Enterprise risk management refers to a top-down risk management approach, whereby leadership identifies, mitigates, and sets policies for the entire organization, including all subsidiaries and business units. Enterprise risk management is a common approach among U.S. utilities. Black Hills also employs a front-middle-back-office structure for transactional activity: generally, the front office is responsible for entering into transactions, the back office is responsible for transactions settlements, and the middle office is responsible for monitoring of risk.<sup>33</sup> This is also a common structure in U.S. utilities.

The Black Hills Corporation Board of Directors oversees risk management, including its policies, procedures, and systems. The Board's Audit Committee is kept informed of risks at meetings with Black Hills' Chief Risk Officer.<sup>34</sup> Black Hills' Executive Risk Committee is responsible for the administration of all risk related activities and provides governance and oversight for the implementation of Black Hills' risk policies.<sup>35</sup> Black Hills' Executive Credit Committee oversees all credit risk and related activities.<sup>36</sup> For the Gas Supply and Transportation Services business unit specifically, Black Hills employs a "Risk Management Committee that is charged by the Executive Risk Committee with overseeing the gas asset optimization activities and day-to-day operations, including reviewing daily position and activity reports as necessary."<sup>37</sup>

Black Hills' risk policies are codified in key documents. One document is the "Black Hills Corporation: Natural Gas Utilities Segment Gas Supply and Transportation Services Risk Policy and Procedure,"<sup>38</sup> which lays out the organization of risk management and risk management roles of key committees related to natural gas supply and transportation activity. The document specifies Black Hills' risk management principles,<sup>39</sup> reporting requirements, and internal controls.<sup>40</sup> The "Revised and Restated Policy on

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<sup>33</sup> Request PSC-3-3, CONFIDENTIAL Corp-Risk-03 BHC Gas Supply and Transportation Services Risk Policy and Procedure\_FINAL Dec 2020 ("Gas Supply and Transportation Risk Policy"), section 2.3.

<sup>34</sup> Gas Supply and Transportation Risk Policy, section 2.1.1.1.

<sup>35</sup> Gas Supply and Transportation Risk Policy, section 2.1.2.

<sup>36</sup> Gas Supply and Transportation Risk Policy, section 2.1.3.

<sup>37</sup> Gas Supply and Transportation Risk Policy, section 2.1.4.

<sup>38</sup> Gas Supply and Transportation Risk Policy.pdf.

<sup>39</sup> Gas Supply and Transportation Risk Policy, section 2.4.

<sup>40</sup> Gas Supply and Transportation Risk Policy, section 3.



Contract and Signature Authority”<sup>41</sup> or “Signature Authority Policy,” which applies to all employees,<sup>42</sup> establishes (1) the approved authority limits of employees for the approval of transactions and payment disbursements, (2) guidelines and procedures for review and approval of contracts, and (3) signature authority requirements.<sup>43</sup> The Signature Authority Policy specifies a threshold for determining a “Material” transaction (i.e., [REDACTED]) for transaction review.<sup>45</sup> The Signature Authority also defines thresholds for Board of Director review,<sup>46</sup> as well as senior management/executive review.<sup>47</sup> Other key risk documents include employee codes of conduct, Federal Energy Regulatory Commission (“FERC”) compliance and reporting, and corporate policies on derivatives, records management, and credit.<sup>48</sup> Overall, we found Black Hills’ risk management documents clear and thorough.

On a day-to-day basis, Black Hills’ middle office monitor transactions that are entered into Endur, the accounting database software used by Black Hills to track transactional activity. When a transaction is entered, it becomes part of the Endur ledger that is then able to be seen by all users of Endur, including the middle office, which is required to confirm all transactions that are entered into by the front office. Any disputed transactions are raised with the traders who entered the transaction to identify any discrepancies or concerns, typically by reviewing the written, recorded online “chats” between BHSC traders and traders at counterparties. Moreover, Black Hills’ credit risk department, which is part of Black Hills’ treasury department, circulates any limitations on trading with counterparties if a counterparty is approaching or has met its credit limit with Black Hills. In such a case, Treasury employees will update the credit limit associated with the relevant counterparty directly in Endur – potentially down to zero dollars – effectively preventing traders from further transacting with such a counterparty.<sup>49</sup>

### II.A.3.b. Audit Period Results

We reviewed risk management results during the Audit [REDACTED] period and found no material violations or concerns associated with the implementation of risk management policies. We tested various aspects of Black Hills’ risk policies to determine if Black Hills had acted in accordance with its policies and offer our findings as follows.

First, we confirmed that Black Hills was in compliance with its own risk policies regarding production of certain plans and reports. For example, the Gas Supply and Transportation Risk Policy calls for the

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<sup>41</sup> Request PSC-3-2, CONFIDENTIAL 2022-07-25 Policy 2 CORP LEGAL 02 (FINAL) (“Signature Authority Policy”).

<sup>42</sup> Signature Authority Policy, section 4.1.

<sup>43</sup> Signature Authority Policy, section 1.

■ [REDACTED]  
<sup>45</sup> Signature Authority Policy, section 4.8.1.1.

<sup>46</sup> Signature Authority Policy, section 5.2.

<sup>47</sup> See, e.g., Signature Authority Policy, section 5.4.

<sup>48</sup> Gas Supply and Transportation Risk Policy, section 4.

<sup>49</sup> Notes from June 12, 2023 call.

development of annual supply portfolio and asset specific plans,<sup>50</sup> including those related to use of derivative instruments.<sup>51</sup> Black Hills was able to provide the plans it developed pursuant to its Gas Supply and Transportation Risk Policy.<sup>52</sup> Additionally, the risk policy related to the Natural Gas Utilities Segment for gas asset optimization requires certain reports to be prepared by the middle office.<sup>53</sup> Black Hills was able to provide sufficient evidence of the middle office's compliance with these requirements.<sup>54</sup>

Second, we confirmed that Black Hills tracks and enforces the risk policy requirement that employees submit who conduct gas supply and transportation services work on behalf of Black Hills Energy annually provide signed acknowledgments of the risk policy.<sup>55</sup> This is an important step in ensuring compliance with the risk policy among the relevant set of employees.

Third, we identified the five largest transactions involving Black Hills during the Audit Period and confirmed that the approval of those transactions and the disbursement of payments for those transactions were conducted in compliance with the risk policy documents.<sup>56</sup> For each of these transactions, Black Hills' risk management policies allowed gas supply buyers to enter into each of these transactions without further written approvals since they were index-priced transactions completed in the normal course of business and necessary to preserve system reliability.<sup>57</sup>

Fourth, we reviewed BHSC's performance during and in the aftermath of Storm Uri to determine any deviations or changes in risk management. We identified no instances of non-compliance with risk policies. Transaction activity was conducted within the bounds of the risk management policies, though was impacted by the very high prices observed during Storm Uri. BHSC executive staff delegated authority for approval of some transactions during this period to allow for gas supply purchasers to secure needed supply for customers. Black Hills provided sufficient evidence of these delegations of approval authority, including its consistency with delegation procedures allowed in Black Hills' risk management documents.<sup>58</sup>

Fifth, we requested a list of all incidents of non-compliance, misconduct, or violations of the risk policies in place during the Audit Period. Black Hills confirmed that there were no such instances.<sup>59</sup>

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<sup>50</sup> Gas Supply and Transportation Risk Policy, sections 3.2.1.1 and 3.2.3.1.

<sup>51</sup> Gas Supply and Transportation Risk Policy, section 1.2.2.1.

<sup>52</sup> Request PSC-5-9 CONFIDENTIAL Attachment PSC-5-9(a) & (c).

<sup>53</sup> Request PSC-3-3 CONFIDENTIAL Corp-Risk-03 BHC Risk Policy Natural Gas Utilities Segment Gas Asset Optimization – FINAL 03-05-2020, sections 2.1.4.3.6 and 2.2.1.3.1.

<sup>54</sup> Request PSC-5-20.

<sup>55</sup> Request PSC-5-9, CONFIDENTIAL Risk Policy Acknowledgment Received Tracking 2020 – 2022.

<sup>56</sup> CONFIDENTIAL Request PSC-5-15; see also Request PSC-7-7.

<sup>57</sup> Request PSC-7-7.

<sup>58</sup> Request PSC-7-7; CONFIDENTIAL Attachment PSC-7-7(a) – February and March Approval; CONFIDENTIAL Attachment PSC-7-7(b).

<sup>59</sup> Request PSC-5-19.

## II.A.4. Auditing

One important aspect of utility internal controls is the ability to self-direct audit activity, whether internal, external, or both. We requested all internal and external audits/studies commissioned and relied upon related to natural gas fuel and transportation procurement, planning/forecasting, contract administration, risk management, and hedging. Black Hills provided one document in response, an external report conducted by Aether Advisors, LLC (“Aether Report”).<sup>60</sup>

The Aether Report<sup>61</sup> was commissioned by Black Hills to assess Black Hills Energy’s gas supply planning and procurement, which included its hedging activities. Several recommendations were proffered, and we followed up with Black Hills to determine which, if any, they accepted and the status of any recommendation implementation efforts. Black Hills identified some recommendations that it accepted and took steps to implement, including solicitation of additional products in their formal request for proposal process, pursuit of additional storage and transportation capacity for Rate Area 3, acquisition of new storage capacity on the NGPL for Rate Areas 1 and 2, and an attempt to extend an existing storage asset management agreement (“AMA”).<sup>62</sup> Other recommendations are still under consideration by Black Hills.<sup>63</sup> We address some of the substance of the Aether Report elsewhere in this report, but include a recommendation in this chapter that Black Hills complete its consideration of the Aether Report recommendations and seek to implement those that are identified as in customers’ interest.

## II.B. Conclusions

**Conclusion II-1:** Black Hills’ organizational structure is sufficiently defined, with roles adequately specified, including responsibilities, which can help create an environment of accountability.

**Conclusion II-2:** BHSC and the middle office is well-staffed with experienced personnel.

**Conclusion II-3:** BHSC has faced staffing challenges since 2019 and the onset of the COVID-19 pandemic, including historically high attrition rates and recruiting challenges. BHSC has taken reasonable steps to address these challenges, including cross-training for existing employees to leverage existing talent and skill sets and the expansion of recruiting efforts to other industries trained in logistics management.

**Conclusion II-4:** Black Hills’ risk management processes, procedures, organization, and documentation (as it relates to gas supply and transportation transactions) are reasonable and should encourage effective risk management.

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<sup>60</sup> Request PSC-3-4.

<sup>61</sup> Request PSC-3-4, CONFIDENTIAL Black Hills Energy Nebraska and Iowa GPP Review (“Aether Report”).

<sup>62</sup> Request PSC-5-14(a).

<sup>63</sup> Request PSC-5-14(a), (b).

**Conclusion II-5:** There were no reported or observed instances of non-compliance, violations, or other non-conformance with risk protocols during the Audit Period.

**Conclusion II-6:** The Aether Report is a useful document that provides reasonable recommendations worthy of full consideration by Black Hills. (**Recommendation 2023-1**)

## **II.C. Recommendations**

**Recommendation 2023-1:** Black Hills complete its consideration of the Aether Report recommendations and seek to implement those that are identified as in customers' interest.

## III. Planning and forecasting

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### III.A. Findings

#### III.A.1. Planning and forecasting approach

To help reliably meet customer demand for gas, BHSC conducts regular forecasting of gas demand on behalf of Nebraska Gas. The forecasts are then used to develop and execute portfolio plans for gas supply purchase products, volumes, and timing.<sup>64</sup> BHSC conducts its forecasting and planning by pipeline and Nebraska Gas Rate Area: NNG and NGPL for Rate Areas 1 and 2—which include eastern Nebraska—and Iowa, and Tall Grass for Rate Area 3—which includes western Nebraska—and Kansas.<sup>65</sup> BHSC forecasts Nebraska Gas’ gas needs over three time horizons: annual, monthly, and daily.<sup>66</sup>

BHSC develops an annual forecast based on historical customer demands and assumed load growth. This forecast provides Nebraska Gas’ best estimate of gas to be purchased over the coming year.<sup>67</sup> The process for developing the annual forecast begins at the conclusion of the winter season (March 31), with a goal of producing the forecast by [REDACTED] [REDACTED]. This timeline allows BHSC to understand the needs for the following winter in time to make longer-term procurement decisions during the summer.<sup>69</sup> To develop this annual forecast, BHSC uses regression analysis to determine the relationship between historical customer demand and historical weather data.<sup>70</sup> Specifically, Nebraska Gas uses [REDACTED] gas demand data<sup>71</sup> and the 30-year monthly weather averages published by the National Oceanic Atmospheric Administration (“NOAA”).<sup>72</sup> While wind speed is considered in daily forecasting, wind speeds are not used for the annual or monthly demand forecasts.<sup>73</sup> The resulting regression equation can then be used to predict customer demand based on forecasted weather.<sup>74</sup> This same regression equation is also used to develop the twelve monthly gas demand forecasts generated in a given year.<sup>75</sup>

For its daily day-ahead demand forecasts, BHSC uses different approaches depending on the Nebraska Gas Rate Area. The reason for the bifurcated approach is the significantly higher volumes for Rate Areas

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<sup>64</sup> May 22 Presentation, slide 16.

<sup>65</sup> Notes from May 22, 2023 call.

<sup>66</sup> May 22 Presentation, slides 17 and 23.

<sup>67</sup> Request PSC-3-6.

[REDACTED]

<sup>69</sup> Notes from May 22, 2023 call.

<sup>70</sup> Request PSC-3-6.

<sup>71</sup> May 22 Presentation, slide 17.

<sup>72</sup> Request PSC-3-6; May 22 Presentation, slide 23.

<sup>73</sup> Notes from May 22, 2023 call.

<sup>74</sup> Request PSC-3-6.

<sup>75</sup> Request PSC-3-6.

1 and 2, which require additional speed and precision of forecasts for those Rate Areas compared with Rate Area 3, since BHSC has more stringent balancing requirements on NGPL and NNG, which primarily serve Rate Areas 1 and 2.<sup>76</sup> For these two Rate Areas, BHSC uses [REDACTED] [REDACTED] to generate its daily forecasts. [REDACTED] [REDACTED] and is used by dozens of natural gas distribution utilities across the U.S. [REDACTED] [REDACTED] model, which was trained on historical demand and weather data, uses inputs of daily demand data, observed hourly weather data, and forecasted hourly weather data (including wind speed) to generate estimates of gas demand for the upcoming eight days. [REDACTED] For Rate Area 3, BHSC forecasts daily [REDACTED] employing a regression formula to determine a variable usage amount per heating degree day (“HDD”). [REDACTED] Then, to determine how much gas is needed, BHSC multiplies the forecasted HDD by the variable usage factor and adds that amount to the base usage.<sup>81</sup> For the months of June, July, and August, BHSC uses average temperature rather than HDD as a regression input.<sup>82</sup>

In addition to estimating gas supply needs, the forecasts explained above also estimate the amount of pipeline transportation capacity that is needed for the given time horizon. Additionally, BHSC conducts a “peak day” study on an annual basis, which estimates current customer daily demand should the region experience the coldest day actually experienced over the prior 30 years.<sup>83</sup> This analysis informs BHSC as to whether existing gas supply resources are sufficient to meet the coldest expected day, or whether additional firm services are required.<sup>84</sup> We inquired as to whether BHSC also studies a “peak winter” scenario, whereby gas supply resources are adequate to meet the demands of the coldest winter experienced in the past 30-40 years. BHSC indicated that it does not do so, though it does conduct scenario analysis in its monthly forecasting, estimating “warmer” and “colder” than normal winters by analyzing customer demands during winter weather that varies by one standard deviation from a normal winter.<sup>85</sup>

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<sup>76</sup> Notes from May 22, 2023 call.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

<sup>81</sup> Request PSC-3-6; see also, Request PSC-5-17 Confidential Attachment 5-13a - NNG\_NGPL Annual Plans 20-22 Zone ABC; Confidential Attachment 5-13a - TIGT Annual Plans 20-22 NE only.

<sup>82</sup> Request PSC-5-17 Confidential Attachment 5-13a - NNG\_NGPL Annual Plans 20-22 Zone ABC; Confidential Attachment 5-13a - TIGT Annual Plans 20-22 NE only.

<sup>83</sup> Notes from May 22, 2023 call. This peak day planning method takes into account the experience during Storm Uri and the extreme cold weather experienced during December 2022.

<sup>84</sup> Notes from May 22, 2023 call.

<sup>85</sup> Notes from May 22, 2023 call.

Bates White requested, received, and reviewed many of the forecasts generated by BHSC for Nebraska Gas during the Audit Period, including (a) all of the annual forecasts, (b) all monthly forecasts for 2022, and (c) all daily forecasts for January and July 2022. We confirmed BHSC’s forecast methodology and outputs were as described.<sup>86</sup>

Once generated, the gas demand forecasts become [REDACTED] inputs to BHSC’s procurement strategy for Nebraska Gas. [REDACTED] gas requirements are determined from the [REDACTED] forecast. [REDACTED] BHSC then develops a portfolio plan based on that forecast that specifies needed quantities of baseload and peaking supply, as well as estimates of storage utilization and available pipeline and supplier services.<sup>88</sup> Throughout the year, BHSC then uses [REDACTED] forecasts to adjust its portfolio plan, including changes to planned storage activity and additional gas supply purchases. [REDACTED] Daily forecasts determine if any further actions need to be taken for the upcoming day (or days). If, for example, forecasted demand exceeds the sum of the existing baseload purchases and the planned storage withdrawals, BHSC will determine how to cover the deficit, such as making daily spot market purchases or increasing storage withdrawals, among other options.<sup>90</sup>

While a detailed examination of the appropriateness of Nebraska Gas’ supply, storage and pipeline resources given its current and expected future customer demands was beyond the scope of this audit, there are several observations we believe are worth noting. BHSC participates in a FERC-approved capacity release program where firm pipeline capacity BHSC has under contract but does not anticipate it will need is offered back to the market via pipeline bulletin boards.<sup>91</sup> The capacity offered includes a maximum daily quantity and the term (i.e., beginning and end dates). BHSC can also specify whether that capacity is “recallable” (i.e., they can take it back should it need it), or non-recallable. BHSC indicated that virtually all of its released capacity is recallable.<sup>92</sup> Under an approved Nebraska program, BHSC is able to retain 50% of the revenues it receives from capacity releases and refunds the remaining 50% to customers.<sup>93</sup> Since natural gas utilities must plan to meet customer demands on the coldest expected day and months, it is common that they have excess capacity during many periods, even during portions of the winter, and the capacity release program provides a way for natural gas utilities to optimize the value of its resources.

We note that during each of the four winters of the audit period, portions of contracts on TIGT, NGPL, and NNG were released either for the entire winter period, or the entire year. For example, [REDACTED] [REDACTED] on NNG is a TFX service (NNG’s name for tariffed transport service) with a maximum daily

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<sup>86</sup> See attachments to Request PSC-5-13. We note that the daily forecasts for Rate Areas 1 and 2 did not include eight days of forecasted consumption, but only for the following day’s demand. See: Request PSC-5-13 Confidential Attachment 5-13c – NNG\_NGPL Rate Area 1 and 2 Daily Forecasts Jan and July 2022.

[REDACTED]  
<sup>88</sup> May 22 Presentation, slide 16.

[REDACTED]  
<sup>90</sup> May 22 Presentation, slide 18.

<sup>91</sup> There were four releases of one contract that were not recallable. Three were for a single shoulder winter month (November or March) and one was for the three winter months December 2021-February 2022. May 22 Presentation, slide 12.

<sup>92</sup> Request PSC-5-8, Confidential Attachment 5-8.

<sup>93</sup> Before the Nebraska Public Service Commission, Application No. NG-0066, April 10, 2012.

quantity of [REDACTED] Dth from November 2022 through March 2023, with various receipt and delivery points into Rate Areas 1 and 2. [REDACTED] Portions of that contract have been released by BHSC for the entire November-March period in each of the four winters for which capacity release data was supplied.<sup>95</sup> These releases, however, do not necessarily mean that Nebraska Gas is oversupplied. To illustrate a case in point, on December 22 and 23, 2022, Nebraska experienced some particularly cold weather.<sup>96</sup> There were 146 gas supply transactions during that month, with the vast majority (106) being daily purchases to cover the extremely cold weather that occurred during the month.<sup>97</sup> Supply-related transactions in December 2020 and December 2021 totaled only 68 and 35 transactions, respectively.<sup>98</sup> [REDACTED]

These observations lead us to two recommendations, one for Black Hills to consider and one for the Commission to consider. Many natural gas utilities plan to meet current customer demands for the coldest winter experienced over an approximately 30-year period (comparable to the “peak day” scenario described above). As previously stated, Black Hills indicated it uses one standard deviation from normal as its coldest winter expected.<sup>100</sup> To the extent Nebraska has actually experienced colder winters over the past 30 years than the current Black Hills planning standard, we recommend Black Hills consider using the colder winter as its planning standard.

There are numerous considerations in assessing whether a natural gas utility’s supply portfolio is structured to achieve the lowest reasonable cost consistent with supply reliability. One of these considerations is how well the gas utility’s supply assets match both current and projected customer loads under a variety of conditions. This analysis necessarily includes assessing current and projected customer demands, the existing supply assets, and both current and future opportunities for restructuring assets to better match expected customer demands. There are several paths that can be taken for making such an assessment. This scope can be included in a future audit, initiated in a separate proceeding or included as part of an Integrated Resource Plan referred to in III.A.3 below. We recommend that the Commission consider including such an analysis in a future proceeding.

[REDACTED]

<sup>95</sup> Request PSC-5-8, Confidential Attachment 5-8.

<sup>96</sup> “Here is today's weather outlook for Dec. 22, 2022 in Omaha, NE,” December 22, 2022, *Omaha World Herald*, [https://omaha.com/weather/here-is-todays-weather-outlook-for-dec-22-2022-in-omaha-ne/article\\_bda0f07d-f456-5369-ae86-39ac5ef80ff7.html#:~:text=It%20might%20be%20a%20good,mix%20of%20sun%20and%20clouds](https://omaha.com/weather/here-is-todays-weather-outlook-for-dec-22-2022-in-omaha-ne/article_bda0f07d-f456-5369-ae86-39ac5ef80ff7.html#:~:text=It%20might%20be%20a%20good,mix%20of%20sun%20and%20clouds); “Here is today's weather outlook for Dec. 23, 2022 in Omaha, NE,” December 23, 2022, *Omaha World Herald*, [https://omaha.com/weather/here-is-todays-weather-outlook-for-dec-23-2022-in-omaha-ne/article\\_23b5d504-f69e-5268-9991-a2a83a98eb32.html](https://omaha.com/weather/here-is-todays-weather-outlook-for-dec-23-2022-in-omaha-ne/article_23b5d504-f69e-5268-9991-a2a83a98eb32.html).

<sup>97</sup> Request PSC-3-8, REVISED Confidential 3-8 Supply Summary Report.

<sup>98</sup> Request PSC-3-8, REVISED Confidential 3-8 Supply Summary Report.

[REDACTED]

<sup>100</sup> Notes from May 22, 2023 call.



BHSC had an Asset Management Agreement (“AMA”) with a wholesale storage operator that was highly beneficial to Nebraska Gas. The storage operator chose not to renew that agreement.<sup>101</sup> Asset managers are typically wholesale market participants who operate in diverse markets and have the expertise to optimize the value of assets they manage. During interviews, Black Hills indicated it continues to examine asset management opportunities and we commend and encourage Black Hills to continue investigating those opportunities where reliability, procurement flexibility and financial risk are not compromised.

### **III.A.2. Forecast accuracy**

Nebraska Gas measures the accuracy of its forecasts primarily by assessing the quality of the “fit” of the regression equation used for forecast future gas supply demand. The best statistical measure for the fit of a regression line in this case is the “adjusted R-squared,” which measures how closely an equation fits a particular independent data set. R-squared values can range between 0 and 1, with a perfect R-squared statistic being “1,” which implies that the regression equation is able to predict the independent variable perfectly. Strong R-squared values for utility forecasts typically exceed 0.75.

As is shown in the table below, Nebraska Gas’ annual consumption forecasts have strong adjusted R-squared statistics, primarily in the non-summer months. The table highlights in green all adjusted R-squared statistics greater than 0.75, while shading those below 0.25 in red. Notably, the “red” results cluster in the summer months, while the non-summer months perform much stronger. This is not surprising, since (as explained above) Nebraska Gas uses HDDs as the primary explanatory variable in its forecast regression equations for the winter months, which have strong correlation with expected consumption. In the summer months, Nebraska Gas uses average historical weather data, which has less explanatory power for Nebraska Gas’s expected consumption.

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<sup>101</sup> Notes from June 12, 2023 interview.

**Figure III-1: Gas Consumption Forecast Regression Results (Adjusted R-Squared Statistic)<sup>102</sup>**

Month	Adjusted R Square - NNG and NGPL	Adjusted R Square - TIGT 15000	Adjusted R Square - TIGT 15100	Adjusted R Square - TIGT 15200
██████████	0.98	0.95	0.95	0.91
██████████	0.98	0.96	0.92	0.94
██████████	0.97	0.94	0.94	0.93
██████████	0.93	0.88	0.92	0.86
██████████	0.80	0.76	██████████	██████████
██████████	0.21	0.03	0.06	0.01
██████████	-0.03	0.04	0.07	0.00
██████████	0.18	0.00	0.02	-0.01
██████████	██████████	0.19	██████████	0.12
██████████	0.88	0.75	0.83	██████████
██████████	0.96	0.85	0.89	0.87
██████████	0.98	0.92	0.97	0.91
██████████	0.98	0.92	0.96	0.90
██████████	0.97	0.93	0.87	0.92
██████████	0.98	0.94	0.94	0.93
██████████	██████████	0.90	0.93	0.89
██████████	0.84	0.13	██████████	██████████
██████████	0.08	0.06	0.11	0.01
██████████	0.04	0.01	0.06	0.00
██████████	0.00	-0.01	-0.01	0.07
██████████	0.77	██████████	0.08	0.22
██████████	0.88	0.79	0.84	██████████
██████████	0.96	0.91	0.91	0.90
██████████	0.97	0.92	0.95	0.89
██████████	0.97	0.92	0.96	0.90
██████████	0.98	0.95	0.95	0.94
██████████	0.93	0.92	0.92	0.91
██████████	0.93	██████████	0.81	0.83
██████████	0.83	██████████	██████████	██████████
██████████	0.03	0.04	-0.01	-0.01
██████████	-0.01	-0.01	-0.01	0.01
██████████	-0.01	0.04	0.01	0.04
██████████	██████████	0.20	-0.01	0.14
██████████	0.88	██████████	0.83	██████████
██████████	0.94	██████████	0.84	0.80
██████████	0.95	██████████	0.86	██████████

Forecasting consumption of natural gas is inherently difficult and will always include error. The primary cause of forecast error is weather. Colder than expected weather typically leads to greater consumption, so if the weather forecast used in developing the gas consumption forecast is milder, the forecast will estimate consumption that is too low. Another potential driver of forecast error is unexpected changes in customer growth, which can lead to greater (or lesser) gas consumption compared to forecast. Energy

<sup>102</sup> The three values for TIGT correspond with three distinct geographic points along the TIGT pipeline. See Confidential Attachment 5-13a - NNG\_NGPL Annual Plans 20-22 Zone ABC; Confidential Attachment 5-13a - TIGT Annual Plans 20-22 NE only.

efficiency efforts – which BHSC states are growing – can also impact the accuracy of consumption forecasts.<sup>103</sup>

In our view, Nebraska Gas and BHSC forecast natural gas consumption and pipeline utilization in a reasonable manner. The explanatory power of the regression model used in forecasting consumption is strong, as shown in Figure III-1 above. In addition, we observed that BHSC monitors the performance of its forecast models and can become aware of any problems or issues with the model’s accuracy, should that occur.<sup>104</sup>

### III.A.3. Strategic planning

In addition to typical gas distribution utility forecasting and planning for expected gas supply demand and pipeline capacity, Nebraska Gas – and Black Hills Corporation, more broadly – are also facing other planning challenges. We briefly address some of those issues in this section.

A longer-term challenge facing Black Hills (and other gas distribution utilities around the U.S.) is the risk of legislation that ultimately curbs customer demand for gas supply. While several U.S. cities have passed or considered action curbing new natural gas installations in residential and/or commercial buildings, it was the state of New York in May 2023 that passed the first state-wide ban on natural gas installations in new buildings, beginning in 2026.<sup>105</sup> Several states also have emissions reductions targets that affect natural gas utilities, including California, Colorado, Washington, Oregon, Massachusetts, New York, and Vermont.<sup>106</sup> Most notable among these is Colorado, where Black Hills serves 208,060 natural gas customers, second in number only to Nebraska.<sup>107</sup> In 2021, Colorado began requiring gas distribution utilities to reduce greenhouse gas emissions by 4% from 2015 levels by 2025 and 22% by 2030.<sup>108</sup> Starting in 2023, utilities, including a subsidiary of Black Hills, are required to file “Clean Heat Plans” that demonstrate compliance through measures such as energy efficiency programs and beneficial electrification (which allows customers to switch from gas furnaces and appliances to heat pumps and electric appliances).<sup>109</sup> The net impact of such programs will be less gas demanded by customers, and thus less gas supplied and transported by the utility.

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<sup>103</sup> Notes from June 22, 2023 call.

<sup>104</sup> Notes from June 22, 2023 call.

<sup>105</sup> Rachel Ramirez and Ella Nilsen, “New York becomes the first state to ban natural gas stoves and furnaces in most new buildings,” *CNN*, May 3, 2023, <https://www.cnn.com/2023/05/03/us/new-york-natural-gas-ban-climate/index.html>.

<sup>106</sup> Elaine Prause, *Regulatory Assistance Project*, “Modernizing Gas Utility Planning: New Approaches for New Challenges,” September 2022, footnote 4.

<sup>107</sup> Black Hills Energy, “Sustainability Report 2022,” page 8, available at: [https://www.blackhillsenergy.com/sites/blackhillsenergy.com/files/615403\\_23\\_2022-sustainability-report-final.pdf](https://www.blackhillsenergy.com/sites/blackhillsenergy.com/files/615403_23_2022-sustainability-report-final.pdf).

<sup>108</sup> Colorado Department of Regulatory Agencies, “What are Clean Heat Plans?,” available at: <https://puc.colorado.gov/cleanheatplans#:~:text=What%20are%20Clean%20Heat%20Plans.2030%2C%20from%20a%202015%20baseline.>

<sup>109</sup> Ibid.

At this point, we are unaware of any similar efforts in other states in Black Hills' service footprint. Nevertheless, the risk of additional legislation remains, and the impact of Colorado's legislation and potential legislation in other states is likely to reduce demand for natural gas in the overall Black Hills footprint. Since Nebraska Gas is a subsidiary of Black Hills Corporation, and since costs imposed by BHSC on behalf of Nebraska Gas and its affiliates is shared among Nebraska Gas and those same affiliates, it is important to recognize that even if no legislative action is taken in Nebraska, Nebraska Gas customers may not be insulated from supply, demand, and price impacts of legislation in other Black Hills states. The impacts of legislatively-mandated reductions in natural gas demand and/or supply can be numerous, including raising questions of stranded assets, non-gas alternative investments, and cost-benefit considerations in natural gas infrastructure investments, among many potential others. Furthermore, formulas that allocate shared services based on relative size or customer demand of the various Black Hills Corporation operating units will potentially impact Nebraska customers as a result of these initiatives in other jurisdictions.

Black Hills has begun addressing these challenges through its strategic planning efforts. At the corporate level, Black Hills has implemented a "top down" strategic plan that recognizes the energy transition (to decarbonization and a changing resource mix), identifying the challenges associated with these changes, and taking steps to ensure the long-term viability of Black Hills.<sup>110</sup> As part of this strategic planning efforts, Black Hills is looking at a range of solutions, including reducing its carbon footprint through use of low carbon fuels, such as hydrogen and renewable natural gas, and carbon offsets.<sup>111</sup> These are reasonable steps. Another approach Black Hills could consider is to implement an integrated resource plan ("IRP"), which are sometimes referred to as "Gas Resource Plans" for natural gas utilities. IRP planning generally seeks to identify optimal utility investments and strategic options over a long-term planning horizon. IRPs test the optimal resource portfolio and investment decisions against future scenarios, such as further environmental legislation, material changes in customer growth rates, increased electrification, technological breakthroughs (such as widespread adoption of hydrogen in electric generation, transportation, and industrial uses), and commodity price changes, among other potential variables. Poor utility resource portfolios and investment decisions can lead to inefficient outcomes for customers and stranded assets for the utility. Black Hills is not currently mandated to conduct any IRP planning, though has conducted one Gas Resource Plan in Colorado.<sup>112</sup> Given the current market and legislative forces at play, we include a recommendation regarding Black Hills' consideration of an IRP process for Nebraska Gas, its overall gas distribution utility division, or both.

Another challenge faced by Nebraska Gas arose due to the impact of Storm Uri, and that impact persists to the present. The extreme supply and demand conditions – and the resulting historically-high prices – that were observed during Storm Uri have continued to affect gas supply market dynamics. For example, BHSC personnel explained that since Uri, some suppliers of gas and storage capacity are less willing to

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<sup>110</sup> Notes from June 22, 2023 call.

<sup>111</sup> Notes from June 22, 2023 call.

<sup>112</sup> Notes from June 22, 2023 call.

offer pricing terms that help insulate customers from the volatility of daily pricing.<sup>113</sup> These suppliers prefer greater exposure to daily pricing. These conditions could limit the tools available to BHSC to mitigate price volatility. BHSC has not yet needed to alter its procurement process since it continues to receive competitive offers through the RFPs it issues for baseload fixed-price supplies and peaking services. BHSC stated, however, it continues to also pursue other products that are available with the goal of mitigating price volatility, including asset management agreements, additional hedging strategies, and various storage agreements.<sup>114</sup> We address specific procurement of such products in Chapter IV and BHSC's hedging activities in Chapter V.

## III.B. Conclusions

**Conclusion III-1:** Nebraska Gas and BHSC forecast natural gas consumption and pipeline utilization in a reasonable manner.

**Conclusion III-2:** BHSC adequately monitors the performance of its forecast models and can become aware of any problems or issues with the model's accuracy, should any arise.

**Conclusion III-3:** Nebraska Gas' forecast methodology and outputs were carried out during the Audit Period as described.

**Conclusion III-4:** BHSC's winter planning assumes a winter that is one standard deviation colder than normal. Typically, natural gas distribution companies define a "design winter" as the coldest winter for which they plan. Many natural gas distribution companies define a "design winter" as the coldest winter actually experienced over a 30- or 40-year period. (**Recommendation 2023-2**)

**Conclusion III-5:** Black Hills taken reasonable strategic planning steps to in response to long-term challenges to its historical business model.

**Conclusion III-6:** Black Hills could benefit from implementation of an integrated resource planning process. Given the current market and legislative forces at play, we include a recommendation regarding Black Hills' consideration of an IRP process for Nebraska Gas, its overall gas distribution utility division, or both. (**Recommendation 2023-3**)

## III.C. Recommendations

**Recommendation 2023-2:** Black Hills should assess the definition and implementation of a "design winter" as the coldest winter for which they plan, using a long-term historical data set (i.e., at least 30 years of historical data) to the extent it is colder than its current planning standard.

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<sup>113</sup> Notes from June 12, 2023 call.

<sup>114</sup> Notes from June 12, 2023 call.

**Recommendation 2023-3:** Black Hills should consider implementing an integrated resource planning process for Nebraska Gas, its gas utility division, or both, to determine risks, benefits, and costs of future scenarios (e.g., changes in law, technological/resource breakthroughs (i.e., hydrogen), high gas prices, low gas prices, etc.).

## IV. Procurement

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### IV.A. Findings

#### IV.A.1. Products and Services Purchased

To reliably serve its customers, Nebraska Gas dispatches significant amounts of natural gas every day. For example, Nebraska Gas purchased 51,964,689 Dth of natural gas to serve its customers in Rate Areas 1, 2, 3, and 4<sup>115</sup> during the Audit Period.<sup>116</sup> Since Nebraska has no significant natural sources of natural gas reserves within its borders, Nebraska Gas must rely on sources of gas in other states and regions.<sup>117</sup> Thus, Nebraska Gas must ensure access to sufficient natural gas supplies.<sup>118</sup> Nebraska Gas must also make sure it can reliably transport the gas supply to its distribution network of in-state pipelines. These two objectives require Nebraska Gas to procure both gas supply and gas transportation. BHSC is responsible for these activities on behalf of Nebraska Gas and the other natural gas distribution utilities under the Black Hills Utility Holdings umbrella.

BHSC has numerous options in securing natural gas supply. Contracts for gas supply can vary by term, the timing of delivery, and the receipt point, among others. Below are some of the sources of physical supply used by BHSC for Nebraska Gas customers during the Audit Period:

- **Contract Terms:** The effective contract term BHSC procures from suppliers can vary. The longest term supply contract observed during the Audit Period was a one-year supply agreement.<sup>119</sup> BHSC also pursued and procured seasonal contracts (terms of 3-5 months, typically covering the summer or winter periods) and monthly contracts. Shorter-term transactions included day-ahead and intraday transactions.
- **Baseload vs. Peaking:** Most of BHSC's purchases are known as "baseload" supply, which sets a fixed volume to be supplied for the duration of the supply contract. "Peaking" contracts are supply arrangements whereby BHSC reserves a volume of gas that BHSC has the option to call upon each day of the contract term.<sup>120</sup> Absent the availability of additional storage, these

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<sup>115</sup> Rate Area 4 includes agricultural and other high-volume customers geographically located in Rate Areas 1, 2, and 3.

<sup>116</sup> Request IR-PSC-3 spreadsheets.

<sup>117</sup> U.S. Energy Information Administration, "Nebraska State Profile and Energy Estimates," July 20, 2023, available at: <https://www.eia.gov/state/analysis.php?sid=NE>.

<sup>118</sup> This is not the case for Rate Area 5, which includes residential and commercial customers that do not take gas supply from Nebraska Gas, but rather a third-party supplier (called "Competitive Natural Gas Providers," or "CNGPs"). In 2022, there were seven active CNGPs serving 80,379 customers. The largest provider is an affiliate of Nebraska Gas – Black Hills Energy Services – with approximately 34% market share. See CNGP Annual Report for 2022, available at: <https://psc.nebraska.gov/sites/psc.nebraska.gov/files/doc/2022ChoiceSummaryReport.pdf>.

<sup>119</sup> See Request PSC-5-18 attachments.

<sup>120</sup> Request PSC-3-8 REVISED Confidential 3-8 Supply Summary Report.

peaking contracts are the most reliable way to serve those hours and days during the winter when customer demands are particularly high. The volume under reserve may vary—such contracts are referred to as “swing” contracts.

- **Receipt Point and Delivery Point:** Receipt points on a pipeline are those points where BHSC delivers gas it has purchased into one of the pipelines with which it has contracted. Delivery points are those points where the delivering pipeline connects with the Black Hills system and redelivers the Black Hills supplies to Nebraska Gas. All supply to Rate Areas 1 and 2 were delivered on either the NNG or NGPL pipelines at numerous delivery points into the Nebraska Gas system. Supply to Rate Area 3 is delivered to one of several delivery points by the Tall Grass Interstate Transmission system.<sup>121</sup>
- **Pricing Structure:** Prices for physical supply are generally based on an established index. Multi-month supplies at fixed prices are generally based the results of the RFPs submitted to BHSC. Monthly and daily supplies are priced on various first-of-the month and daily indices.

In addition to physical supply contracts, BHSC can also rely upon natural gas storage arrangements. BHSC has natural gas storage arrangements on all three contracted pipelines.<sup>122</sup> Calling on release of storage may require notice (via a nomination process), require no notice at all, or some hybrid combination of the two.<sup>123</sup> BHSC can also contract with a third-party to store physical gas supplies and to release those supplies when requested by BHSC. We explain more about the storage agreements in section IV.A.6 below.

BHSC contracts with interstate pipeline companies to transport gas supplies reliably to the Nebraska Gas distribution system. BHSC contracts for capacity on three pipelines: NGPL, NNG, and TIGT. Figure IV-6, Figure IV-7, and Figure IV-8 included in section IV.A.5 below show the detailed maps for each pipeline. NGPL, which stretches from southern Texas to northern Illinois, has a segment that services southeastern Nebraska.<sup>124</sup> NNG runs from west Texas to the northern Plains states, including eastern Nebraska.<sup>125</sup> Tall Grass originates in Wyoming and stretches across much of western and central Nebraska.<sup>126</sup> The pipelines serving Nebraska Gas are regulated by FERC. FERC approves the pipeline tariffs that contain all relevant terms and conditions associated with each service offered by the pipeline. Pipeline contracts specify the maximum daily quantity (“MDQ”) that may be transported, the length or term of the contract, whether the service is firm or interruptible, the service level (i.e., whether the transportation is year-round or seasonal), and the applicable maximum tariff rates. For the typical firm

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<sup>121</sup> Request PSC-5-18 attachments.

<sup>122</sup> May 22 Presentation, slide 19.

<sup>123</sup> Notes from May 22, 2023 call.

<sup>124</sup> Request PSC-3-9, 3.9 NGPL System\_Map.

<sup>125</sup> Request PSC-3-9, 3.9 NNG System\_Map.

<sup>126</sup> Request PSC-3-9, 3.9 TIGT System\_Map.



service, shippers such as BHSC have the right to renew its pipeline contracts at the FERC-approved maximum rate.

FERC has also approved a system where shippers who determine that they may not need all their capacity for some period of time could offer it into the market. That capacity could be offered as recallable (i.e., the shipper can take back that capacity if or when it is needed), or non-recallable, in which the capacity is returned to the original shipper only at the end of the agreed upon term. BHSC participates in this program and, under an arrangement with the Nebraska PSC, shares any revenue it receives from these sales 50/50 with customers.<sup>127</sup> This program incentivizes BHSC to optimize the value of these pipeline resources while mitigating the costs charged to customers for these resources. For the audit period, virtually all of the capacity released by BHSC was recallable.<sup>128</sup>

Each year, BHSC develops an annual portfolio plan, which incorporates the annual demand forecast (explained in Chapter III above). The portfolio plan determines the quantities of baseload supply, storage utilization, and peaking supply that BHSC will require for the upcoming year. BHSC considers pipeline and gas supply services available and develops a procurement plan based on those results.<sup>129</sup> The plan seeks three objectives: (1) supply reliability, (2) price stability, and (3) flexibility to respond to changing supply and demand dynamics.<sup>130</sup>

BHSC makes [REDACTED] price gas purchase – [REDACTED] – for the [REDACTED] year out. For example, in July 2022, a purchase was made for [REDACTED]. Such contracts include both a fixed volume and fixed price. BHSC uses a Request for Proposals (“RFP”) approach for this purchase. [REDACTED] BHSC also uses RFP processes for term purchases (defined as baseload purchases of greater than one month) and monthly baseload purchases.<sup>132</sup> For both term and monthly baseload purchases, the volume is a must-take commitment. Monthly purchases are generally priced at the Inside FERC first-of-month index price. Multi-month purchases are decided based on responses to the RFPs. Term purchases may allow for differing monthly volumes. Term purchases are typically conducted in the summer or fall prior to the winter period, while monthly purchases are typically executed five to seven days prior to the beginning of the month of delivery.<sup>133</sup> In making monthly purchases, BHSC considers the current storage inventory relative to its plan, month-ahead weather forecasts, market conditions, and any other factor that could impact customer demand or supply deliverability.<sup>134</sup>

Term and monthly baseload purchases at fixed prices carry a must-take commitment. Consequently, BHSC must limit its monthly baseload commitments to those volumes that have a high probability of

<sup>127</sup> Before the Nebraska Public Service Commission, Application No. NG-0066, April 10, 2012.

<sup>128</sup> Request PSC-5-8, Confidential Attachment 5-8.

<sup>129</sup> May 22 Presentation, slide 16.

<sup>130</sup> May 22 Presentation, slide 16.

[REDACTED]

<sup>132</sup> Request PSC-3-8.

<sup>133</sup> Request PSC-3-8. See also, Request PSC-5-18 attachments.

<sup>134</sup> May 22 Presentation, slide 17.

being needed, regardless of the severity of the weather. Overcommitting to baseload purchases leaves BHSC with two options: injecting winter-priced gas into storage, or selling the excess supply into the market, usually at a loss since excess supply is typically caused by warmer weather, which tends to deflate daily prices. To meet customer demand above baseload supply, BHSC has several options. It can withdraw gas from storage, call on its peaking contracts, or purchase daily spot supplies (if available). These decisions are based on several factors including availability, relative prices, and the level of storage inventory. Firm peaking contracts are procured through the RFP process and are typically entered into in the summer or fall before the winter period. These contracts typically carry a reservation, or demand, charge to reserve the capacity and the commodity is typically priced using a gas daily index.<sup>135</sup>

The adequacy of pipeline capacity under contract for Nebraska Gas is also reviewed after each winter as part of the annual portfolio planning process. BHSC looks at the last [REDACTED] years of usage and weather data, which establishes system requirements under normal winter weather. In addition, BHSC also plans its resource needs to meet its “Design Day” requirements. BHSC defines its Design Day as the current customer loads should it experience the coldest day actually experienced in the last 30 years.<sup>136</sup> If a resource deficit is shown to exist, BHSC will seek to procure additional firm peak day service(s).<sup>137</sup>

In our view, BHSC’s overall procurement approach and processes appear reasonable. Importantly, we observed that BHSC seeks to use competitive procurement (via the RFP process) whenever possible. When not possible, such as pursuit of daily transactions, we observed evidence of market canvassing by BHSC personnel to seek the lowest-priced, reliable offers from counterparties. BHSC appropriately uses reasonable accounting, trading, and accounting tools, such as Endur for all transactions and the Intercontinental Exchange (“ICE”) for trading activity.<sup>138</sup>

## IV.A.2. Summary of Contracts and Transactions

During the Audit Period, Black Hills Corporation affiliates were parties to 36 master agreements with suppliers of natural gas.<sup>139</sup> These master agreements – called “NAESB” contracts, short for the North American Energy Standards Board – help reduce the time and cost of buying natural gas by codifying a set of agreed-upon terms and conditions of supply that does not change or require renegotiation for each natural gas transaction. When two parties determine to enter into a specific natural gas transaction for the sale or purchase of natural gas supply, the NAESB terms and conditions govern the transaction, and the transaction is memorialized in a short (e.g., one page) “confirmation” agreement that specifies the key details of the transaction, such as price, volume, and delivery point. Details on the NAESB agreements is in Figure IV-1 below. Notably, the list includes no affiliates of Nebraska Gas.

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<sup>135</sup> Request PSC-3-8.

<sup>136</sup> May 22 Presentation, slide 19.

<sup>137</sup> May 22 Presentation, slide 19.

<sup>138</sup> Notes from June 12, 2023 call.

<sup>139</sup> IR-PSC-1, NAESB Folder.

**Figure IV-1: NAESB Agreements in Effect during Audit Period (with Black Hills' Entities)<sup>140</sup>**

Counterparty	Black Hills Entity	Date Entered
[REDACTED]	Black Hills Energy Arkansas	[REDACTED]
[REDACTED]	Arkansas Western Gas Copmany	[REDACTED]
[REDACTED]	Black Hills Energy Arkansas	[REDACTED]
[REDACTED]	Aquila, Inc.	[REDACTED]
[REDACTED]	Cheyenne Light, Fuel, & Power Company	[REDACTED]
[REDACTED]	Aquila, Inc.	[REDACTED]
[REDACTED]	Aquila, Inc.	[REDACTED]
[REDACTED]	Cheyenne Light, Fuel, & Power Company	[REDACTED]
[REDACTED]	Cheyenne Light, Fuel, & Power Company	[REDACTED]
[REDACTED]	Cheyenne Light, Fuel, & Power Company	[REDACTED]
[REDACTED]	Cheyenne Light, Fuel, & Power Company	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Cheyenne Light, Fuel, & Power Company	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Energy Arkansas	[REDACTED]
[REDACTED]	Cheyenne Light, Fuel, & Power Company	[REDACTED]
[REDACTED]	SourceGas Distribution LLC	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Aquila, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Utilitcorp United Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Energy Arkansas	[REDACTED]
[REDACTED]	Black Hills Service Company, LLC	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]
[REDACTED]	Black Hills Utility Holdings, Inc.	[REDACTED]

<sup>140</sup> IR-PSC-1, NAESB Folder.

During the Audit Period, Nebraska Gas (through BHSC) purchased gas from 30 different suppliers of natural gas.<sup>141</sup> The details of those transactions is shown in Figure IV-2 below. Note that the purchase data below did not solely benefit Nebraska Gas, nor was this amount paid by Nebraska Gas customers. Some transactions involved other Black Hills affiliates and their customers. It is a positive outcome that Nebraska Gas is being served by such a large number of suppliers, as it indicates evidence that BHSC is seeking the best deals for customers.

Figure IV-2: Gas Purchases by Black Hills' Entities Benefitting Nebraska Gas<sup>142</sup>

Counterparty	Instrument Type	Total Volume (Dth)	Total Cost	\$/Dth
[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]
[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]
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[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

<sup>141</sup> Request PSC-3-8 REVISED Confidential 3-8 Supply Summary Report.  
<sup>142</sup> Request PSC-3-8 REVISED Confidential 3-8 Supply Summary Report.

Counterparty	Instrument Type	Total Volume (Dth)	Total Cost	\$/Dth
[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]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Figure IV-2 also shows that the transaction volumes and total costs are spread reasonably widely across the gas suppliers. No supplier enjoyed more than [REDACTED] share of the transactions. The largest supplier during the Audit Period was [REDACTED] Dth of gas. Of the other counterparties, only [REDACTED] of the total Audit Period volume. [REDACTED]

Nebraska Gas (through BHSC) also sold a modest amount of gas supply during the Audit Period. The details of those transactions are shown in Figure IV-3. The bulk of these sales are due to gas purchases to serve load that didn't materialize, typically due to changing weather conditions. [REDACTED] is a retail natural gas supplier to commercial and industrial customers. BHSC provides a sales service to [REDACTED] of the reservation charge and all commodity proceeds to Nebraska Gas firm customers.

**Figure IV-3: Gas Sales by Black Hills' Entities Benefitting Nebraska Gas<sup>144</sup>**

Counterparty	Instrument Type	Total Volume	Total Value	\$/Dth
[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]
[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]

Figure IV-4 below shows the purchases of natural gas that are fully attributable to Nebraska Gas. Over the Audit Period, Nebraska Gas (through BHSC) purchased [REDACTED] Dth of natural gas supply. [REDACTED]

[REDACTED]

<sup>144</sup> Request PSC-3-8 REVISED Confidential 3-8 Supply Summary Report.

[REDACTED]

**Figure IV-4: Nebraska Gas' Share of Gas Purchases by Black Hills' Entities (Rate Areas 1-4)<sup>146</sup>**

Month	Purchase Volumes (Dth)
January 2020	████████
February 2020	████████
March 2020	████████
April 2020	████████
May 2020	████████
June 2020	████████
July 2020	████████
August 2020	████████
September 2020	████████
October 2020	████████
November 2020	████████
December 2020	████████
January 2021	████████
February 2021	████████
March 2021	████████
April 2021	████████
May 2021	████████
June 2021	████████
July 2021	████████
August 2021	████████
September 2021	████████
October 2021	████████
November 2021	████████
December 2021	████████
January 2022	████████
February 2022	████████
March 2022	████████
April 2022	████████
May 2022	████████
June 2022	████████
July 2022	████████
August 2022	████████
September 2022	████████
October 2022	████████
November 2022	████████
December 2022	████████
<b>Total</b>	████████

<sup>146</sup> Request IR-PSC-3 spreadsheets.

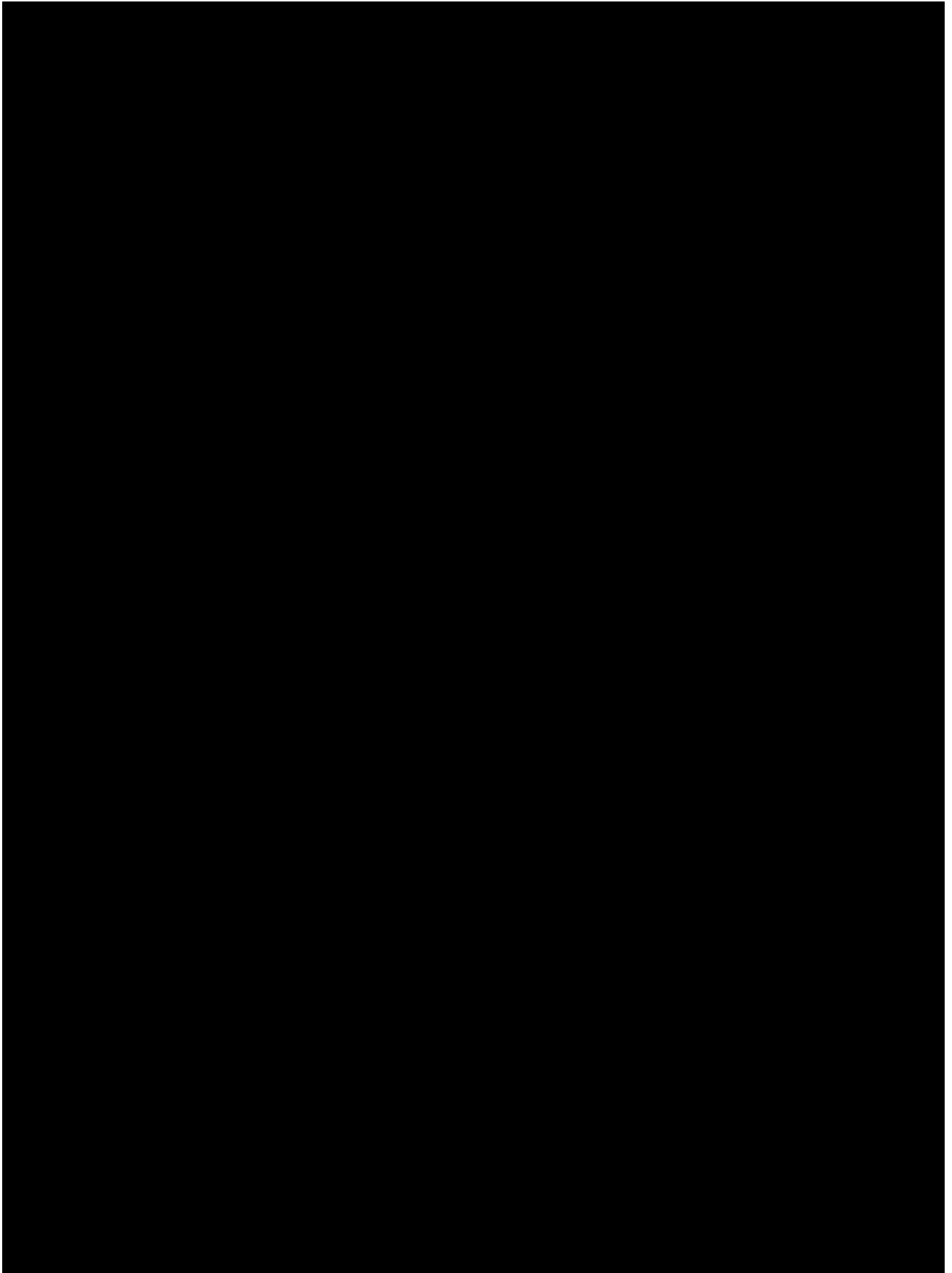
### **IV.A.3. Annual, Term, and Monthly Gas (RFPs)**

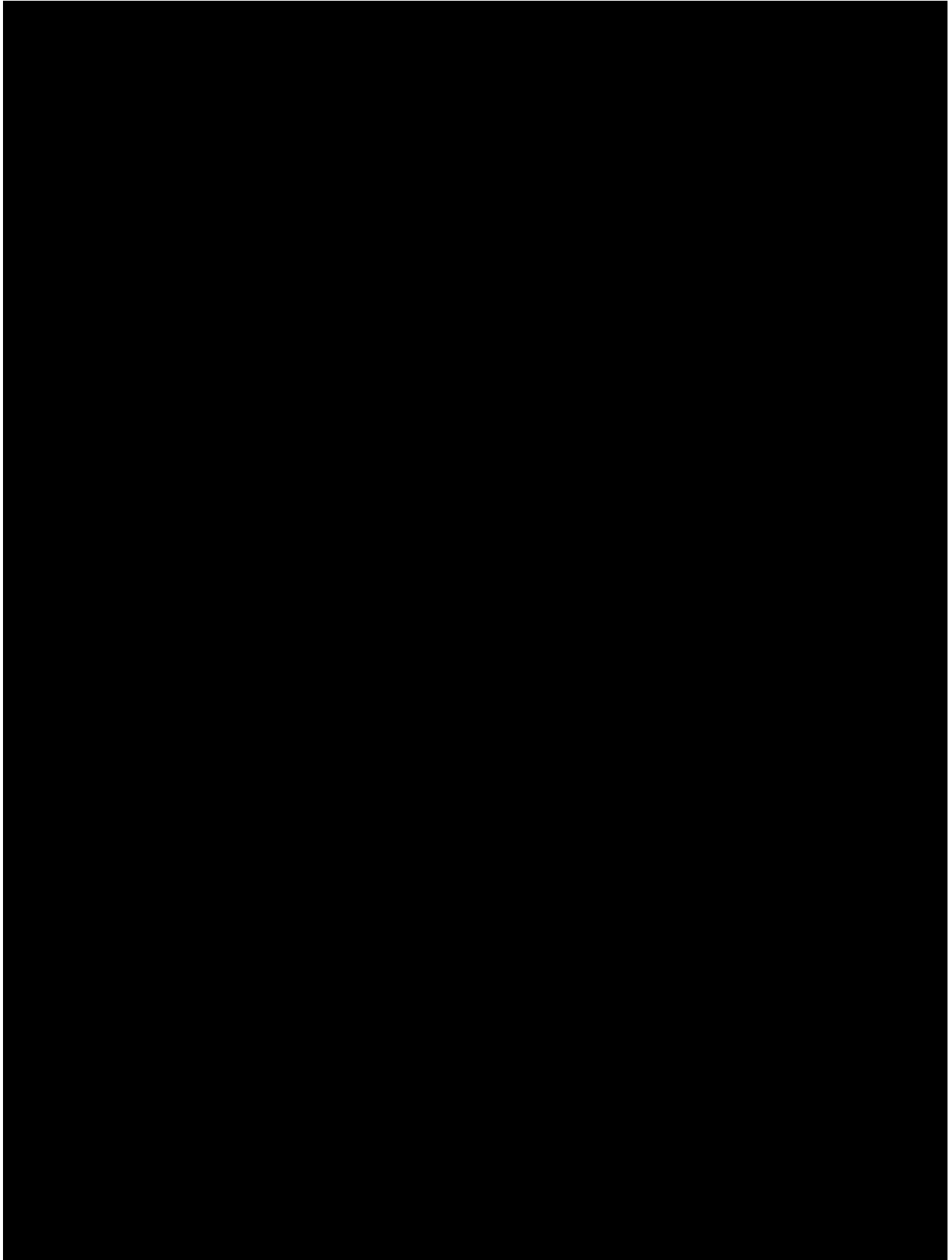
BHSC issued 55 total RFPs during the Audit Period for natural gas supply. The RFPs sought annual, term, or monthly gas, including baseload and peaking gas with either fixed or variable (i.e., “swing”) volumes. Figure IV-5 below – which extends for multiple pages – shows the details of each RFP.

**Figure IV-5: Audit Period RFP Results for Gas Supply** [REDACTED]

Date Issued	Term	RFP Type	Pipeline	Receipt Point	Volume (Dth/day)	Number of Bids	Number of Winners
[REDACTED]							







The RFP process used by BHSC is sound. First, as noted above, BHSC uses the RFP process whenever possible, which is the best way to leverage competition for the benefit of customers. Second, BHSC widely disseminates its RFPs, directly inviting 34 counterparties to participate. ■ This increases the likelihood of success in the RFPs, since consistently inviting large numbers of counterparties allows for maximum participation. Third, BHSC's RFPs are clear, concise, and standardized, which allow potential bidders to adequately understand the RFPs and bid accordingly. The products sought are well defined and the deadline for offers is also clearly stated, with a BHSC contact listed for any questions. Fourth, BHSC's evaluation primarily considers price in determining winning offers. This is important since many of BHSC's RFP invitees are those with whom BHSC affiliates already have NAESB agreements and who have been suppliers of natural gas in the past. BHSC also does assess the reliability and viability of each offer to avoid contracting with risky counterparties.<sup>149</sup> Fifth, BHSC assesses the reasonableness of the bid prices using market price data to serve as a sort of price benchmark. Doing so can increase the confidence of evaluators in the reasonableness of the bid prices received in the RFP, and can avoid executing transactions that are unreasonably priced, particularly if RFP participation is low.

We reviewed the results of the RFPs and found no concerning outcomes. In nearly every case, the winning offer (or offers) were the lowest-priced offers. There were a handful of situations where the winning offer was not the lowest-priced, but one of the lowest-priced offers, often as a result of the volumes offered in the bids. (e.g., Nebraska Gas would select a ■ offer to get the exact volume of gas they were seeking.) We also observed instances where no winning offers were selected due to the offer prices' poor comparison to market price benchmarks. Participation in the RFPs was reasonable and often robust, with an average of about ■ bidders per RFP product throughout the Audit Period. Notably, a given RFP may seek several individual products. Thus, the quality of the competition is likely best judged per product, not per RFP. For example, the June 22, 2022 RFP for July 2022 Monthly Baseload gas actually invited bids for eight products, with the number of bidders per product ranging from ■. ■ BHSC's approach to employ a market price benchmark review in evaluating offers helps mitigate the risk of overpayment for gas supply in the event of a low bidder turnout for a particular product. BHSC also did, in at least one case, forgo an offer at a particular delivery point to select an offer at an alternative delivery point.<sup>151</sup>

#### IV.A.4. Short-Term Transactions

As explained above, BHSC can make daily spot market purchases either in the intraday market or, more likely, in the day-ahead timeframe. These purchases are made when firm baseload, planned storage releases, and firm peaking contracts are insufficient to meet forecasted demand. These purchases may be at a fixed or indexed price. Transactions are made through the ■, with communications logged

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■  
<sup>149</sup> Notes from June 12, 2023 call. See also Request PSC-5-21.

■  
<sup>151</sup> Request PSC-7-2.

within [REDACTED] messaging function and deals entered into Endur. [REDACTED] Offers received from counterparties are often valid for only a short amount of time, and thus BHSC employees use the [REDACTED] nger to canvass the market quickly and efficiently for the best price. BHSC does not always pursue competing offers, but instead uses pricing data on the [REDACTED] to vet offers; BHSC explained that if it solicits an offer from a reliable counterparty and that offer matches or beats the best offer listed on the [REDACTED], BHSC may accept that offer without soliciting competing offers from other counterparties. [REDACTED]

As a check on this process, we sampled several short-term transactions executed during the Audit Period. For each transaction, BHSC provided an explanation of the impetus for the transaction (e.g., to avoid pipeline imbalance penalties), a screenshot of the [REDACTED] deal confirmation, and relevant excerpts of the ICE messenger chat log (if applicable).<sup>154</sup> In every relevant transaction, the lowest priced offer was selected. (In some cases, the other counterparties solicited contacted had no gas to sell.)<sup>155</sup> We did observe a transaction where BHSC purchased gas from a counterparty without soliciting competing offers due to the offer price being lower than the daily gas index price for that delivery point.<sup>156</sup> We also observed one transaction during Storm Uri on February 13, 2021 where BHSC purchased gas to avoid particularly high NNG pipeline imbalance penalties which were in place due to the pipeline declaring “Critical Day” conditions, which ratchets up imbalance penalties. In this case, BHSC received two offers for gas supply and selected the lower priced offer, resulting in savings for Nebraska Gas customers.<sup>157</sup>

#### IV.A.5. Transportation Contracts

BHSC has in place contracts for firm capacity on three pipelines: NGPL, NNG, and Tall Grass. Figure IV-6, Figure IV-7, and Figure IV-8 show the detailed maps for each pipeline. NGPL, which stretches from southern Texas to northern Illinois, has a segment that services southeastern Nebraska. NNG runs from west Texas to the northern Plains states, including eastern Nebraska. Tall Grass originates in Wyoming and stretches across much of western and central Nebraska.

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[REDACTED]

[REDACTED]

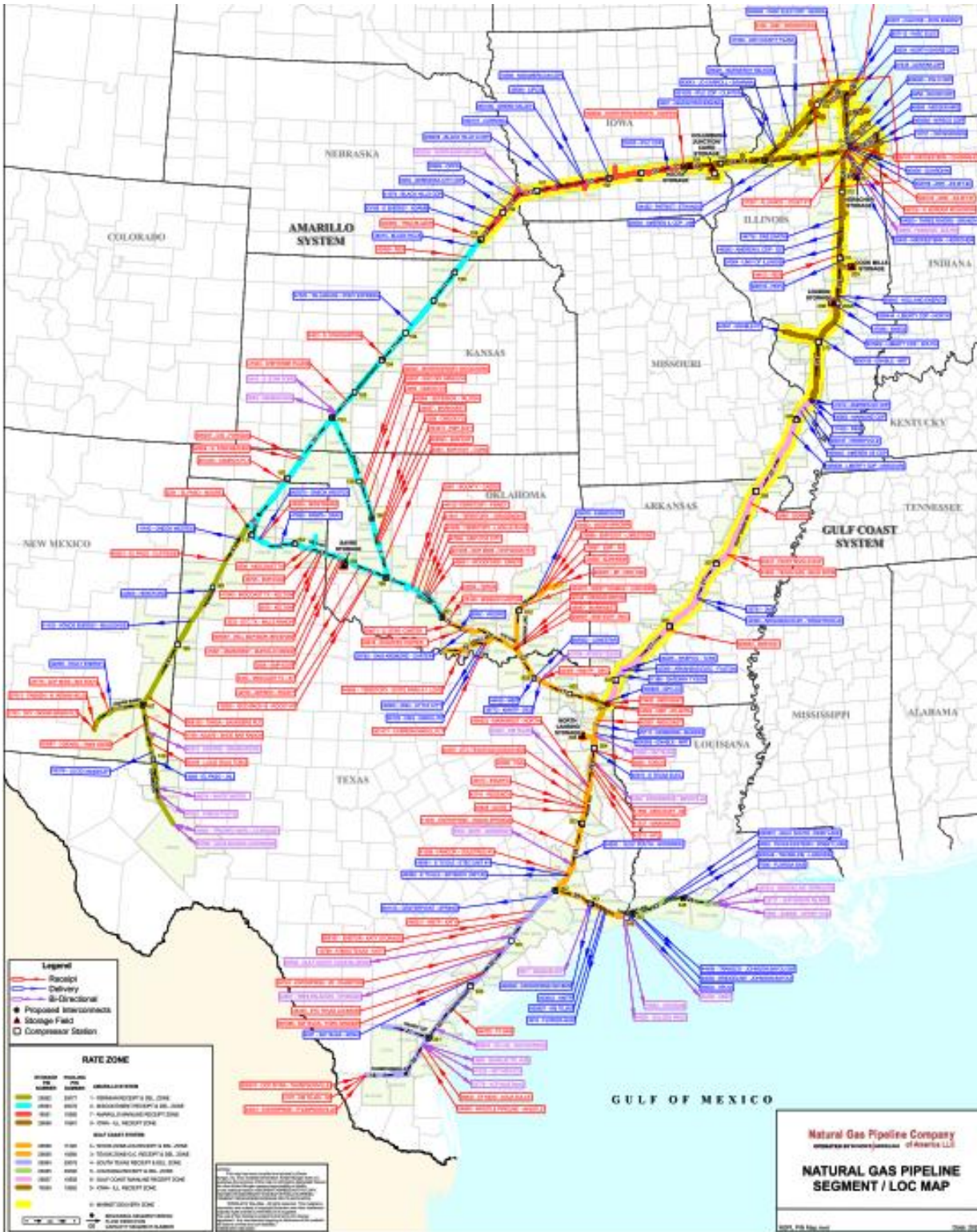
<sup>154</sup> See Request PSC-5-21 attachments.

<sup>155</sup> Request PSC-5-21, Confidential Attachment 5-21 – Deal 57098.

<sup>156</sup> Request PSC-5-21, Confidential Attachment 5-21 – Deal 62124.

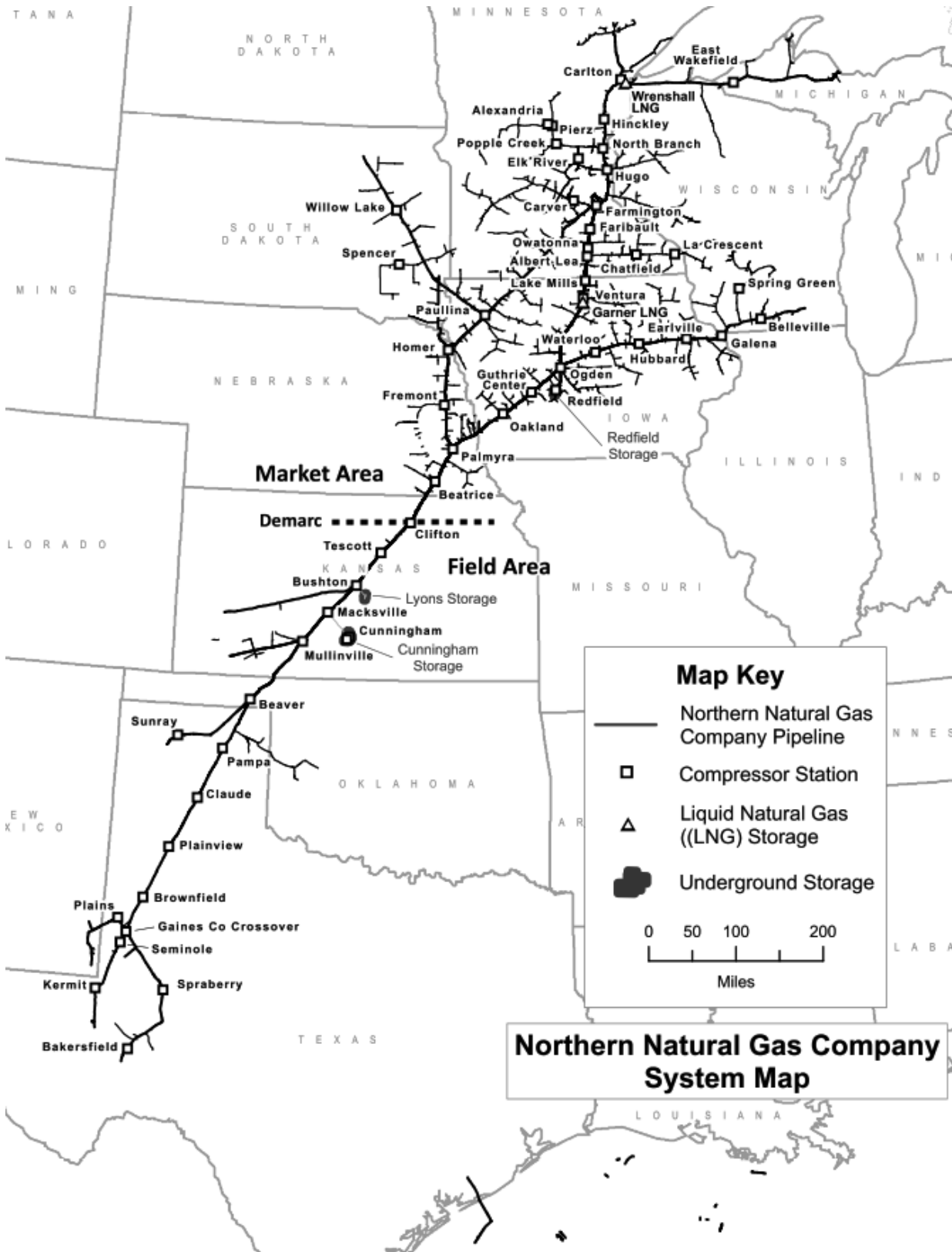
<sup>157</sup> Request PSC-5-21, Confidential Attachment 5-21 – Deal 63076.

Figure IV-6: NGPL Map<sup>158</sup>



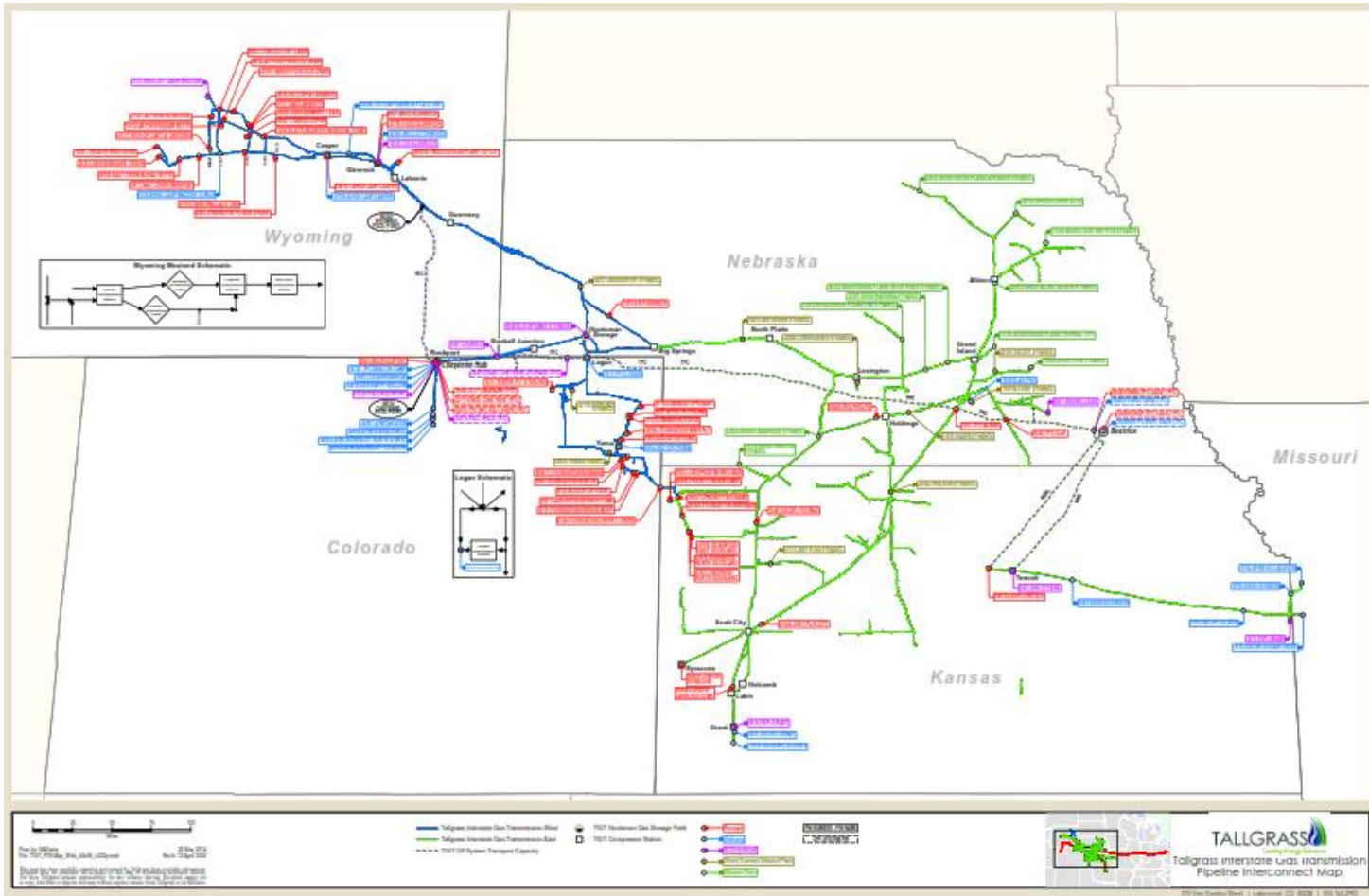
<sup>158</sup> Request PSC-3-9, 3.9 NGPL\_Map.

Figure IV-7: NNG Map<sup>159</sup>



<sup>159</sup> Request PSC-3-9, 3.9 NNG\_Map.

Figure IV-8: Tall Grass Map<sup>160</sup>



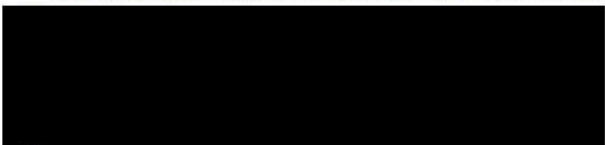
<sup>160</sup> Request PSC-3-9, 3.9 NGPL\_Map.

Figure IV-9 shows the pipeline transportation contracts in place during the Audit Period. In addition to the contracts shown in the table, BHSC also negotiated four separate “short-term” pipeline contracts on NNG<sup>161</sup>: (1) a three-day contract in October 2020 for an MDQ of [REDACTED]; (2) a one-day contract in October 2020 for an MDQ of [REDACTED]; (3) a two-day contract in February 2021 for an MDQ of [REDACTED]/day, and (4) a two-day contract in December 2022 for an MDQ of [REDACTED] Dth/day.

Figure IV-9: Nebraska Gas Pipeline Contract Effective during Audit Period<sup>166</sup>

Contract Number	Pipeline	Service Type	MDQ (Dth/day)	Start Date	End Date
[REDACTED]	TIGT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	TIGT	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NGPL	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

<sup>161</sup> See short-term contracts folder of the NNG folder in IR-PSC-2; Notes from May 22, 2023 call.



<sup>166</sup> Request IR-PSC-2.



Contract Number	Pipeline	Service Type	MDQ (Dth/day)	Start Date	End Date
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	NNG	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

\* MDQ applied only to November 1-March 31; all other days MDQ equals zero  
 \*\* Amendment changed MDQ at certain delivery points, but not overall MDQs  
 \*\*\* Daily Contract Quantity (not an MDQ)

### IV.A.6. Storage and Asset Management Agreements

Storage of natural gas offers gas distribution utilities like Nebraska Gas the ability to address seasonal and daily fluctuations in supply and demand of natural gas to enhance reliability of service and mitigate price volatility. In addition, it results in a resource portfolio that is better optimized for a weather sensitive company such as Nebraska Gas. Nebraska Gas (via BHSC) holds firm storage contracts on each of its three relevant pipelines. The largest quantities of storage are held at NNG, followed by NGPL and Tall Grass. This is consistent with the relative needs and throughput at each pipeline. Each contract specifies certain terms and conditions of service, including the maximum volume of gas that can be stored at any given time, as well as daily limits on injection and withdrawals. “No-Notice” service is the most valuable type of storage, as it allows for storage releases without prior nominations. (Nebraska Gas has this service with Tall Grass; this is the equivalent of the “Delivered Firm Storage” service on NGPL). Figure IV-10 below shows some details of the storage contracts in place during the Audit Period. Note that while the primary contractual terms and constraints are listed (e.g., Maximum Daily Withdrawal Quantity), there are additional limitations on storage injections, withdrawals, and volumes in the contracts.

Figure IV-10: Nebraska Gas' Pipeline Gas Storage Agreements<sup>167</sup>

Contract Number	Pipeline	Service Type	Maximum Storage Quantity (Dth)	Maximum Daily Injection Quantity (Dth/day)	Maximum Daily Withdrawal Quantity (Dth/day)	Maximum Daily Transport Quantity (Dth/day)	Start Date	End Date
[REDACTED]								

<sup>167</sup> Request IR-PSC-2. For detailed information on the NGPL agreements, see Request PSC-3-7 Supplemental Response and

The storage injection and withdrawal results for the Audit Period are shown in Figure IV-11 (for NNG and NGPL, i.e., Rate Areas 1 and 2) and Figure IV-12 (for Tall Grass). Note that the majority of injections occur in non-winter months and the majority of withdrawals occur in winter months, when gas is most valuable.

**Figure IV-11: NNG and NGPL (combined) Audit Period Injections, Withdrawals (Dth)**

Month	Injections	Storage Withdrawals
January 2020	█	█
February 2020	█	█
March 2020	█	█
April 2020	█	█
May 2020	█	█
June 2020	█	█
July 2020	█	█
August 2020	█	█
September 2020	█	█
October 2020	█	█
November 2020	█	█
December 2020	█	█
January 2021	█	█
February 2021	█	█
March 2021	█	█
April 2021	█	█
May 2021	█	█
June 2021	█	█
July 2021	█	█
August 2021	█	█
September 2021	█	█
October 2021	█	█
November 2021	█	█
December 2021	█	█
January 2022	█	█
February 2022	█	█
March 2022	█	█
April 2022	█	█
May 2022	█	█
June 2022	█	█
July 2022	█	█
August 2022	█	█
September 2022	█	█
October 2022	█	█
November 2022	█	█
December 2022	█	█

attachment CONFIDENTIAL Black Hills NGPL Storage Summary.

Month	Injections	Storage Withdrawals
<b>Total</b>		

Figure IV-12: Tall Grass Audit Period Injections, Withdrawals (Dth)

Month	Injections	Storage Withdrawals
January 2020		
February 2020		
March 2020		
April 2020		
May 2020		
June 2020		
July 2020		
August 2020		
September 2020		
October 2020		
November 2020		
December 2020		
January 2021		
February 2021		
March 2021		
April 2021		
May 2021		
June 2021		
July 2021		
August 2021		
September 2021		
October 2021		
November 2021		
December 2021		
January 2022		
February 2022		
March 2022		
April 2022		
May 2022		
June 2022		
July 2022		
August 2022		
September 2022		
October 2022		
November 2022		
December 2022		
<b>Total</b>		

Because of the myriad restrictions on injections and, more importantly, storage withdrawals on a given day, including maintenance of minimum storage values and scheduled releases required by the storage agreement, the decision to release storage capacity is not always a straightforward one based solely on economics. BHSC explained that in deciding whether to release capacity from storage, it considers market conditions, weather, and the time of year. For example, gas released in winter will likely have significantly more value than in other seasons. BHSC explained that to some degree it seeks to ration its storage over the entire winter term, not releasing too much storage gas too early in the winter season.<sup>168</sup>

Overall, we observed evidence that BHSC’s process reasonably considers relevant variables in determining when, and how much, storage gas should be dispatched. We did not discover, however, any formality in the process. For example, such as an analysis of the coldest expected remaining winter that could provide guidance on whether additional (typically) less expensive storage gas can be dispatched in lieu of dispatching peaking services, or even purchasing baseload supply. While we do not doubt BHSC’s expertise in making these assessments, it may help to codify that knowledge and best practices into guidelines for BHSC employees in making these decisions. We include a recommendation to that effect.

In addition to the pipeline storage agreements, BHSC was also party to an agreement with [REDACTED] [REDACTED] for storage capacity on the NNG pipeline.<sup>170</sup> The [REDACTED] [REDACTED], [REDACTED] was for storage only and did not contain incremental firm pipeline transportation—BHSC relied on its existing firm transportation with NNG for transport of any injections or withdrawals.<sup>172</sup> The [REDACTED] allowed for storage of [REDACTED]. During the Audit Period, BHSC received [REDACTED] of stored gas, [REDACTED] expired on [REDACTED]; [REDACTED] BHSC explained that it pursued an extension of the Agreement (or a replacement agreement [REDACTED]). While modest in size compared to the NNG and NGPL pipeline storage agreements, the expiration of the [REDACTED] is a loss for Nebraska Gas. The Agreement provided value to customers, particularly during cold weather events in the winter months. For example, Nebraska Gas received [REDACTED] Dth of released capacity in February 2021 (the month of Storm Uri), the highest one-month release of stored gas under the Agreement across the entire

<sup>168</sup> Notes from May 22, 2023 call.

[REDACTED]  
[REDACTED]  
[REDACTED]

<sup>170</sup> Request PSC-5-12.

[REDACTED]

<sup>172</sup> Request PSC-7-6.

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Audit Period.<sup>177</sup> However, BHSC was able to acquire a larger volume [REDACTED] of new storage capacity on NGPL beginning in 2022 that will help stabilize prices for customers in Rate Areas 1 and 2. [REDACTED]

## IV.B. Conclusions

**Conclusion IV-1:** BHSC's overall procurement approach and processes appear reasonable.

**Conclusion IV-2:** BHSC seeks to use competitive procurement (via the RFP process) whenever possible. When not possible, such as pursuit of daily transactions, we observed evidence of market canvassing by BHSC personnel to seek the lowest-priced, reliable offers from counterparties.

**Conclusion IV-3:** BHSC appropriately uses reasonable accounting, trading, and accounting tools, such as Endur for all transactions and the Intercontinental Exchange for trading activity.

**Conclusion IV-4:** BHSC does not have a volume or percentage target for winter baseload purchases made the summer before and generally seeks to procure less than [REDACTED] of its expected winter needs in advance in order to retain flexibility in the winter.

**Conclusion IV-5:** Black Hills Corporation affiliates were parties to 36 master agreements with suppliers of natural gas during the Audit Period.

**Conclusion IV-6:** During the Audit Period, Nebraska Gas (through BHSC) purchased gas from 30 different suppliers of natural gas. This is a positive outcome that suggests that BHSC is seeking the best deals for customers.

**Conclusion IV-7:** Nebraska Gas (through BHSC) purchased [REDACTED] Dth of natural gas supply. No supplier enjoyed more than [REDACTED] share of the transactions. The largest supplier during the Audit Period was [REDACTED] which supplied about [REDACTED] of the total volume, or [REDACTED] Dth of gas. Of the other counterparties, only [REDACTED] supplied at least [REDACTED] of the total Audit Period volume.

**Conclusion IV-8:** BHSC issued 55 total RFPs during the Audit Period for natural gas supply.

**Conclusion IV-9:** The RFP process used by BHSC is sound, featuring wide dissemination, clearly defined RFPs and products, an evaluation that primarily considers price in determining winning offers, and an assessment of the reasonableness of the bid prices using market price data.

**Conclusion IV-10:** We found no concerning outcomes in the RFPs held during the Audit Period. In every case, the winning offer (or offers) were among the lowest-priced offers. We observed instances where no

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<sup>177</sup> Attachment PSC-3-8, REVISED Confidential 3-8 Supply Summary Report.  
[REDACTED]

winning offers were selected due to the offer prices' poor comparison to market price benchmarks. Participation in the RFPs was reasonable and often robust.

**Conclusion IV-11:** We found no concerning outcomes in our sample of short-term natural gas supply transactions.

**Conclusion IV-12:** BHSC has firm capacity and storage on three pipelines: NGPL, NNG, and Tall Grass. BHSC also negotiated four separate "short-term" pipeline contracts, which are firm daily capacity contracts it pursues on particularly cold days to ensure reliability and avoid pipeline penalties.

**Conclusion IV-13:** Overall, we observed evidence that BHSC's process reasonably considers relevant variables in determining when to dispatch its storage supply resources. There is, however, a lack of formality in the process, and while we do not doubt BHSC's expertise, it may help to codify that knowledge and best practices into guidelines for BHSC employees in determining the dispatch of storage supplies. (**Recommendation 2023-4**)

**Conclusion IV-14:** The expiration of the [REDACTED] is a loss for Nebraska Gas (which attempted to extend the Agreement, but [REDACTED] was unwilling to do so). The Agreement provided value to customers, particularly during cold weather events in the winter months. For example, Nebraska Gas received [REDACTED] of released capacity in February 2021 (the month of Storm Uri), the highest one-month release of stored gas under the Agreement across the entire Audit Period. This agreement helped to mitigate the impacts on Nebraska Gas not only from the supply disruptions that occurred but also from the unusually high daily prices during that period. BHSC was able to acquire a larger volume of new storage capacity on NGPL beginning in 2022 that will help stabilize prices for Rate Area 1 and 2 customers.

## IV.C. Recommendations

**Recommendation 2023-4:** Black Hills should consider formalizing and codifying its process for determining its storage injection and storage withdrawal timing and volume levels.

## V. Hedging

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### V.A. Findings

#### V.A.1. Summary of hedging approach

Natural gas prices can be volatile and Nebraska Gas, like all natural gas distribution utilities, is subject to natural gas price risk. Natural gas prices are affected by numerous factors, including weather (which impacts demand for natural gas and, in the cases of major storms, can impact supply<sup>179</sup>), changes in natural gas imports and exports, changes in domestic storage volumes, changes in production, and delivery constraints (due to pipeline operational issues, such as equipment breakdowns). These factors can significantly impact natural gas prices both in the short-term (i.e., spot market prices) and longer-term (i.e., futures prices).

Hedging is an activity that can reduce exposure to the volatility in natural gas prices. Importantly, hedging is *not* intended to lower natural gas costs to Nebraska Gas or to secure below-market gas prices. Rather, hedging can lower exposure to natural gas price volatility, which means more predictable costs and more stable customer rates. Hedging activity may reduce or increase costs in comparison with a just-in-time purchasing strategy. For example, assume Nebraska Gas buys fixed price gas for a particular winter day in the prior summer for \$5.00 per metric million British thermal unit (“MMBtu”). If the spot price for gas on that winter day ends up averaging \$15.00/MMBtu, the forward purchase of gas for that day saved customers \$10.00/MMBtu. If, however, the spot price of gas on that winter day averages \$3.00/MMBtu, then the forward purchase of gas ends up costing \$2.00/MMBtu more than the just-in-time purchasing approach. Evaluation of the hedging strategy, therefore, is not how the hedged forward price compares to the spot price, but rather how well the forward purchases mitigate the impact of any price spikes of natural gas for that particular winter period. In this way, hedging is similar to purchasing insurance: most of the time, insurance premium payments add costs until the day when an insurable event occurs and protects the holder from large one-time costs. On the other hand, it’s also important not to “over insure” against price spikes, which can potentially carry significant and unsupportable excess costs.

Nebraska Gas’ objectives in natural gas planning are: (1) provide reasonably priced natural gas, (2) provide a high level of reliability, and (3) mitigate price volatility.<sup>180</sup> These are reasonable objectives, and Nebraska Gas’ hedging activity is aimed at balancing these three objectives. BHSC hedges Nebraska Gas’ exposure to gas price volatility through a combination of fixed-price physical gas supply contracts,

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<sup>179</sup> For example, natural gas production in the U.S. Gulf of Mexico was shut down for several days in preparation for and during landfall of Hurricane Ida in August 2021. See Harry Weber, Starr Spencer, and Janet McGurty, “Producers shut in oil, gas output as Hurricane Ida moves toward US Gulf Coast,” *S&P Capital IQ*, August 27, 2021, available at: <https://www.capitaliq.spglobal.com/web/client?auth=inherit#news/article?KeyProductLinkType=2&id=66334139>.

<sup>180</sup> Aether Report, page 5.

gas storage arrangements, and call options purchases.<sup>181</sup> For Rate Areas 1 and 2, it primarily relies on [REDACTED] supplies [REDACTED] storage injections to stabilize prices for the following winter. For Rate Area 3 only, BHSC also purchases financial derivative contracts, specifically natural gas futures contracts and call option contracts.<sup>182</sup> BHSC and Nebraska Gas have codified much of its approach to hedging, risk management, and use of derivative contracts in its written manuals.<sup>183</sup>

Nebraska Gas takes a portfolio approach to its supply procurement, which means it relies upon a variety of instruments to balance its three main objectives. BHSC (on behalf of Nebraska Gas) secures fixed price physical gas supply (via annual, seasonal, or monthly supply contracts), physical storage, supply priced at first-of-the-month indices, and daily supply priced at daily indices.<sup>184</sup> BHSC also uses a “[REDACTED]” approach for injecting [REDACTED] supplies into its storage capacity it has under contract with pipelines and for its financial hedges. BHSC injects gas into storage on [REDACTED]

[REDACTED] BHSC may also seek to buy firm, physical supply with embedded price mitigation tools, such as: (1) baseload supply with a put option;<sup>186</sup> (2) peaking supply with a daily call option priced at a monthly index; (3) peaking supply with a daily call option priced at a daily index with a fixed price cap; and (4) virtual storage.<sup>187</sup>

In securing access to physical supply for its anticipated demand, BHSC seeks to meet [REDACTED] of its average winter load with storage and baseload supply.<sup>188</sup> However, not all of this supply will be at [REDACTED] prices, and thus only some of these arrangements will hedge Nebraska Gas’ price exposure. BHSC’s precise approach to hedging Nebraska Gas’ exposure to natural gas prices differs by Rate Area. For Rate Areas 1 and 2 (Nebraska and Iowa), BHSC seeks to hedge approximately [REDACTED] of the forecasted base case requirement.<sup>189</sup> Most of that price protection [REDACTED] is expected to come from storage volumes, with gas injected ratably through the summer months for withdrawal during winter months.<sup>190</sup> The other hedges (approximately [REDACTED] of the forecasted base case requirement) come from rolling annual fixed price purchases (approximately [REDACTED] at Ventura on NNG).<sup>191</sup> For Rate Area 3, BHSC seeks to hedge approximately [REDACTED] of the forecasted base case requirement.<sup>192</sup> Some protection (about [REDACTED] of the forecasted base case requirement) is expected to come

<sup>181</sup> Request PSC-5-17(b).

<sup>182</sup> Request PSC-5-17(b).

<sup>183</sup> See Request PSC-3-3 Attachments.

<sup>184</sup> May 22 Presentation, slide 20.

<sup>186</sup> This strategy would allow BHSC to have access to physical baseload supply and the option (but not the obligation) to sell the gas back to the supplier at a predetermined price. Thus, if demand was lower than expected and prices fell, BHSC could sell unneeded gas back to the supplier at the strike price in the put option, even if the market price was lower than the strike price.

<sup>187</sup> May 22 Presentation, slide 20.

<sup>188</sup> Request PSC-5-14(a).

<sup>192</sup> May 22 Presentation, slide 22.



from storage, with gas injected ratably through the summer months for withdrawal during winter months. The majority of the protection (about [REDACTED] of the base case requirement) comes from purchases of derivative contracts, specifically [REDACTED] natural gas futures contracts and call options [REDACTED].

We inquired why BHSC used a higher target hedge percentage for Rate Area 3 [REDACTED] than that used for Rate Areas 1 and 2 [REDACTED]. BHSC explained that the primary difference and reason for the different approach is that Rate Areas 1 and 2 allow for significantly more storage than Rate Area 3, leaving Rate Area 3 more exposed to changes in natural gas prices.<sup>194</sup> It was expressly not part of our scope to review the load duration curves of Nebraska Gas and compare it to BHSC's planned and actual hedging activity, so we cannot offer a credible position on the prudence of the [REDACTED] and [REDACTED] targets for the respective Rate Areas. That said, we reiterate that there is typically no "one-size-fits-all" approach to hedging, including hedge targets. The greater the target hedge percentage, the less volatile Nebraska Gas' costs (and customer rates) will be. However, hedging does come at a cost, especially when forward market prices are high with implied volatility.<sup>195</sup> Regarding the different hedge targets for the Rate Areas, we note that BHSC's consultant, while finding nothing imprudent in its "Gas Supply Review" report from January 2023, found that "[m]aterially different hedging approaches in different rate areas might raise equity concerns in the future."<sup>196</sup> We include a recommendation that future audits include a complete assessment of the specific hedge targets pursued by Nebraska Gas.

Regarding the products used by BHSC for hedging purposes, all appear reasonable, commonly-used approaches to mitigating exposure to natural gas price volatility. BHSC's use of storage, where available, is a reliable, reasonable hedging strategy. As we explain in the next section, we see advantages to BHSC's [REDACTED] approach of injecting gas into storage. However, we saw evidence [REDACTED] [REDACTED] harming the economics of this strategy in the summer of 2022.

BHSC's use of fixed price supply contracts is also reasonable, particularly because it is not relied upon to excess. Physical supply contracts are typically "must-take," meaning Nebraska Gas would have to take the entirety of the physical quantity of gas, as contracted, even if the gas was not needed. Typically, any instance where the quantity of must-take gas supply exceeds a utility's demand would be during unseasonably mild weather; in such cases, market prices tend to decrease, sometimes with severity, leaving BHSC seeking to sell excess physical supply possibly at a loss, or potentially inject the gas into storage.

BHSC's hedging consultant recommended it consider purchasing [REDACTED], especially when prices were considered to be high. [REDACTED] This approach would enable BHSC to benefit from

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[REDACTED]

<sup>194</sup> May 22 Presentation, slide 21.

<sup>195</sup> Aether Report, page 55.

<sup>196</sup> Aether Report, page [REDACTED]

[REDACTED]

any significant decline in prices. It is our understanding that BHSC has sought to secure [REDACTED] from the same counterparty from which it is receiving physical, [REDACTED] gas. [REDACTED] BHSC explained that suppliers have been hesitant to provide such an arrangement.<sup>199</sup> Purchasing put options to offset risks associated with physical fixed price supply contracts is a reasonable hedging strategy.<sup>200</sup> We would only suggest that BHSC consider pursuing put options and other financial derivatives from counterparties specializing in such products, such as financial counterparties. The same logic would apply to call options on peaking physical supply contracts. We include a recommendation to this end.

Regarding BHSC's use of financial derivative contracts (futures and call options), we see these as reasonable tools in a gas distribution utility's portfolio. [REDACTED]

[REDACTED] This is a useful strategy that does provide some price protection. However, this strategy does not address Nebraska Gas' basis risk, which is the all-in price of getting gas to Nebraska Gas' distribution system. Thus, an additional approach would hedge not only [REDACTED] exposure but exposure at a liquid trading hub at BHSC's system, such as [REDACTED] on the [REDACTED] pipeline. BHSC indicated that it planned to begin hedging basis risk for 2023-2024. [REDACTED] This is a positive development, and we include a recommendation on this issue. Basis swaps are hedging tools that mitigate the locational price risk of futures hedges. Winter events such as extremely cold temperatures or supply or pipeline disruptions often cause prices near market areas to far exceed prices in supply areas, such as Henry Hub prices. Though extreme, Storm Uri is a case on point. [REDACTED]

[REDACTED] This differential reflected the locational value of supply delivered to market areas, caused by the disruptions to supply and pipeline operations during Storm Uri. Basis swaps will help to mitigate the financial impacts of these types of events, as well as for less extreme events.

## V.A.2. Hedging results

Our review of BHSC's hedging activities on behalf of Nebraska Gas over the three-year Audit Period suggests a planned, consistent approach that was carried out each year without significant material alteration.

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[REDACTED]

<sup>199</sup> Notes from May 22, 2023 call.

<sup>200</sup> For example, assume BHSC purchases physical natural gas at a fixed price of \$4.00/MMBtu for January 2024. Concurrently, BHSC purchases a put option from a financial counterparty with a strike price of \$4.00/MMBtu that expires in January 2024. If prices in January exceeds \$4.00/MMBtu, BHSC pays the fixed \$4.00/MMBtu plus the cost of the option, which expires unexercised. If prices in January are \$3.00/MMBtu, BHSC would exercise the right to sell (or "put") gas at \$4.00/MMBtu; thus, BHSC pays \$4.00/MMBtu plus the cost of the option, minus the \$1.00/MMBtu option value.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

This is a reasonable approach that has benefits. It avoids price speculation, an activity which regulated utilities are often loath to engage in. For example, in July, a utility may consider purchasing price protection for the winter month of January, with the market price being [REDACTED]. The utility may forgo the purchase of that price protection, expecting the market price to fall. Then, in August, the utility may seek to again purchase that same price protection. If the market price has increased, say to \$20.00/MMBtu, and the utility purchases the price protection, the utility may fear regulatory disallowances or other findings of imprudence for “speculating” that prices would fall from July to August, with the opposite occurring, adding to customer costs. Better, then, to pay \$15.00/MMBtu in July.

In our view, BHSC’s hedging approach could reasonably incorporate market conditions and other key data about supply and demand conditions and forecasts in the timing of hedging transaction activity without any suggestion of speculation. It would not be imprudent for a utility to deviate from its predetermined schedule of procurement of hedging instruments if that utility had compelling evidence that the market was in temporary dislocation and prices were likely to move in a more favorable direction in the near term. One example might be a geopolitical event that occurs on the same day RFP bids are due for a fixed price supply RFP or a planned purchase of Henry Hub futures. Such an event might create significant uncertainty in the immediate aftermath, significantly raising prices. It may be prudent for the utility to alter its hedging strategy, such as a greater reliance on options, during such conditions and supporting that decision with reasonable evidence, should it be audited or reviewed by the Commission or its consultants. Similarly, depressed natural gas futures prices relative to historical prices might also justify a change in the hedging strategy, especially if prices were below the company’s current weighted average cost of gas (“WACOG”). Again, the objective not being to get the lowest price but, rather, to take reasonable actions aimed at insulating customers from future price spikes at a reasonable cost.

We make no negative finding associated with BHSC’s hedging approach, including its [REDACTED] [REDACTED] of its derivatives purchases for Rate Area 3 or adherence to a regular schedule and planned approach to hedging transactions, nor do we make any accompanying recommendations on this point. As we note above, BHSC’s approach is reasonable and offers benefits. In our view, hedging policy for a regulated utility is rarely one-size-fits-all, and is often the product of revision, lessons learned, and collaboration between the utility and its stakeholders and its regulators. Regulators should have some say and be aware of the approach being employed by its regulated utilities since ultimately the hedging activity is done on behalf of customers to prevent against rate shocks and overall price volatility.

We also wish to emphasize the materiality of the risk that hedging seeks to mitigate. Consider, for example, the extremely cold weather experienced on December 22 and December 23 of 2022, as discussed above in section II.A.1. During those two days, BHSC transacted for [REDACTED] of daily index or intraday gas at Ventura at an average price of [REDACTED]. That average price is almost [REDACTED] higher than the average daily index price at Ventura paid by BHSC for

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[REDACTED]

transactions in the first 21 days of December 2022. Exposure to these kinds of price spikes is what Nebraska Gas’ hedging program is intended to reduce. In this instance, while BHSC was forced to procure additional daily index gas to meet high demand, the hedges in place prevented BHSC from having to purchase a greater portion of its needs for these two winter days on the spot market at elevated prices.

As noted above, BHSC seeks to hedge of its normal winter exposure in Rate Areas 1 and 2 and of its exposure in Rate Area 3. We confirmed that over the last four winters, Nebraska Gas has entered the winter with actual hedge percentages reasonably within range of targets, particularly in the most recent winter (2022-2023). Figure V-1 and Figure V-2 show the Audit Period results for Rate Areas 1 and 2 and Rate Area 3, respectively. Note that any “indexed” contracts do not provide price hedging protection, as they vary with monthly or daily index prices, although baseload supplies priced at first-of-the-month indices do provide some price protection against winter peaks that may occur during the month.

**Figure V-1: Actual Hedge Percentages as of November 1, Rate Areas 1, 2 (2019-20 to 2022-2023)<sup>206</sup>**

	2019/2020	2020/2021	2021/2022	2022/2023
Physical Fixed Price				
Call Options				
Storage				
<b>Total Hedge Percentage</b>				
Index				

**Figure V-2: Actual Hedge Percentages as of November 1, Rate Area 3 (2019-20 to 2022-2023)<sup>207</sup>**

	2019/2020	2020/2021	2021/2022	2022/2023
Swaps				
Call Options				
Storage				
<b>Total Hedge Percentage</b>				
Index				

An important aspect of assessing BHSC’s hedging program is the *ex-post* test of hedge effectiveness. BHSC’s approach to testing the effectiveness of its hedging program is to review and compare the performance of the various components of its portfolio against the monthly NNG Ventura Inside FERC Index (for Rate Areas 1 and 2) and the monthly commodity WACOG for Rate Area 3.<sup>208</sup> BHSC shared the results of its “Hedged WACOG to Index Comparison,” which compared the WACOG of the hedged

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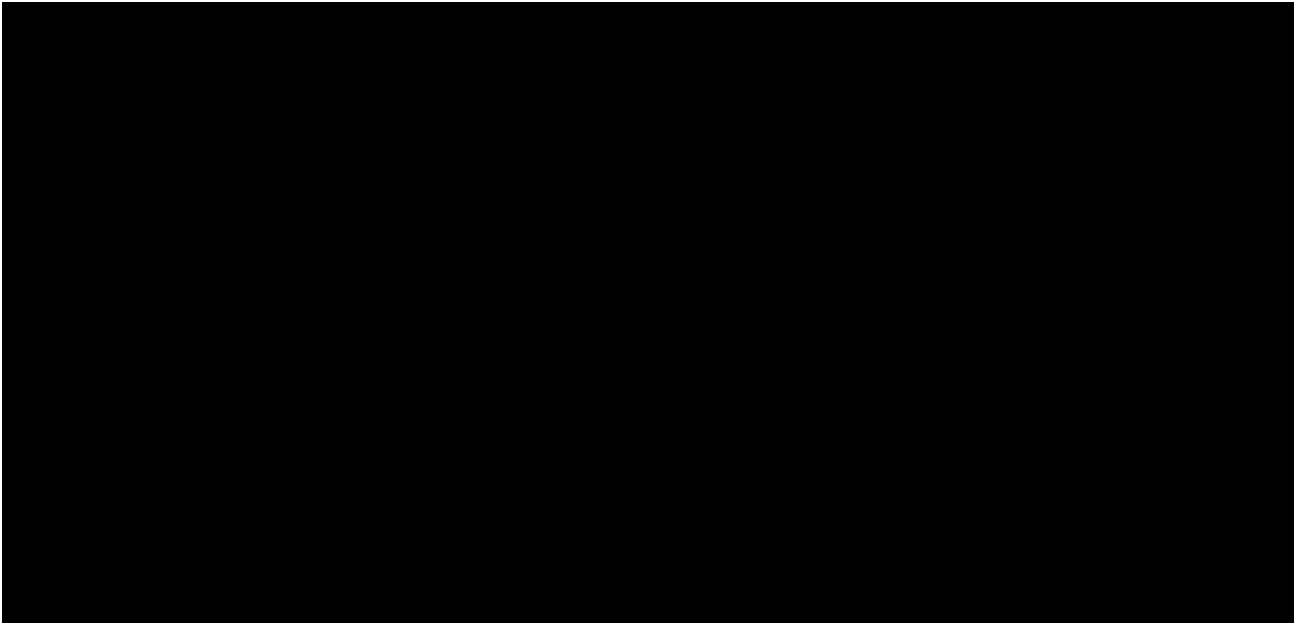
<sup>206</sup> Request PSC-5-17 Confidential Attachment 5-17a.

<sup>207</sup> Request PSC-5-17 Confidential Attachment 5-17a.

<sup>208</sup> Request PSC-5-17(b).

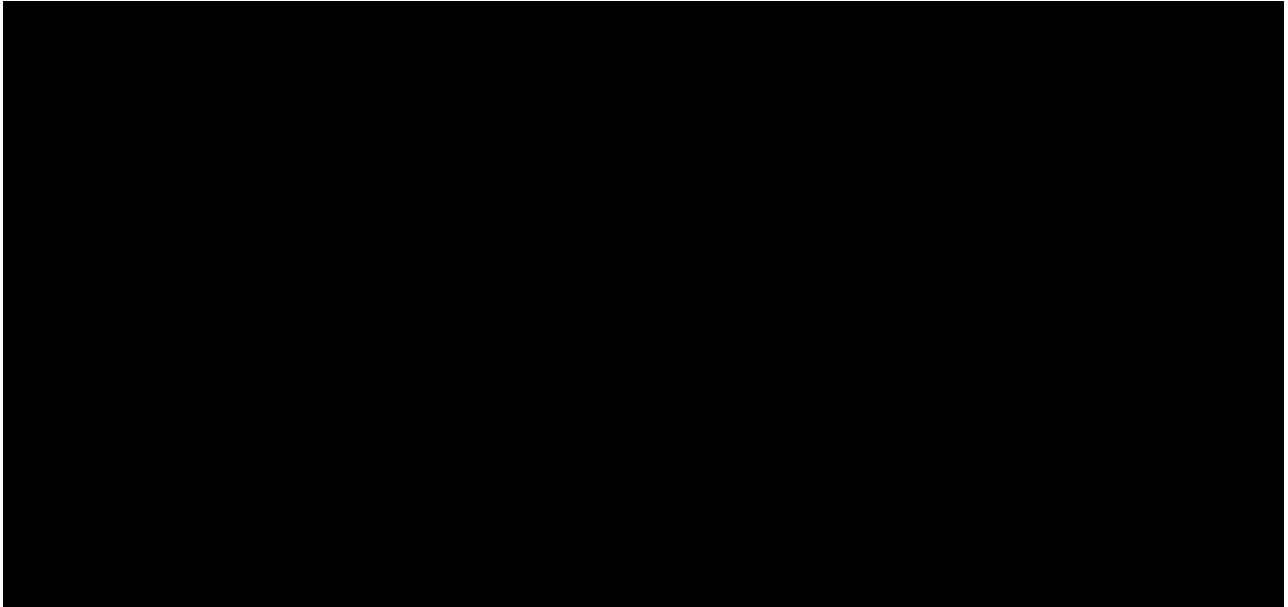
portfolios to an unhedged portfolio that pays only the index price for gas supply. The results for Rate Areas 1 and 2 are shown in Figure V-3 through Figure V-6. Rate Area 3 results follow in Figure V-7 through Figure V-10.

**Figure V-3: Confidential WACOG Results, Rate Areas 1 and 2 (Jan-March 2020)**

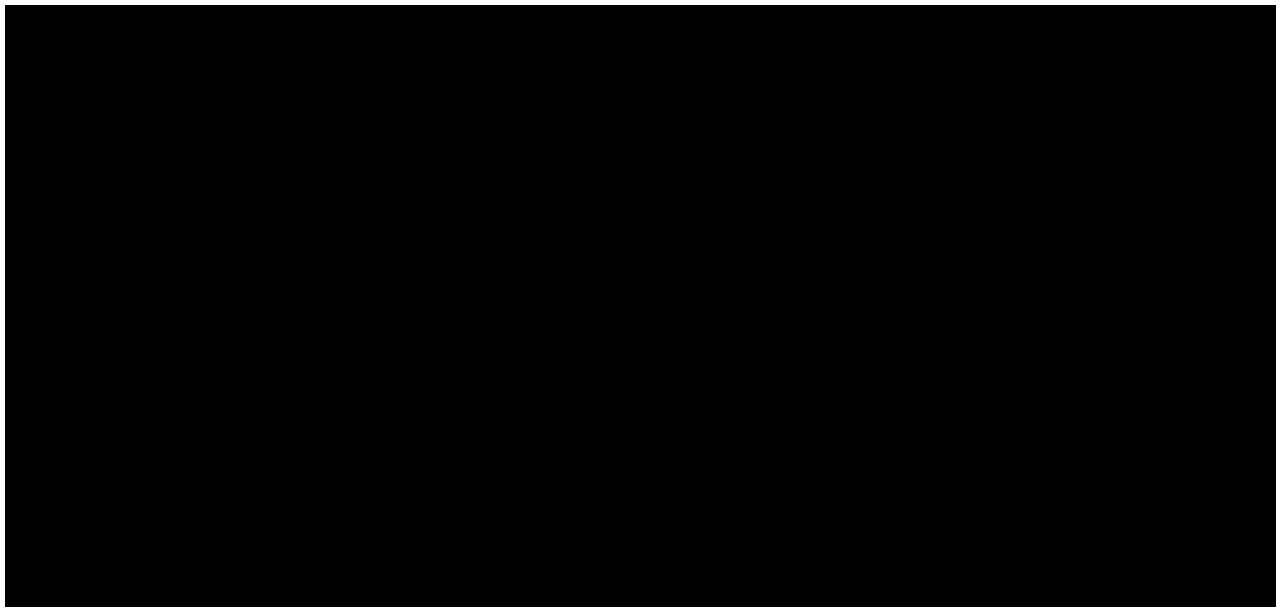


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**Figure V-4: Confidential WACOG Results, Rate Areas 1, 2 (Nov 2020-March 2021)** [REDACTED]

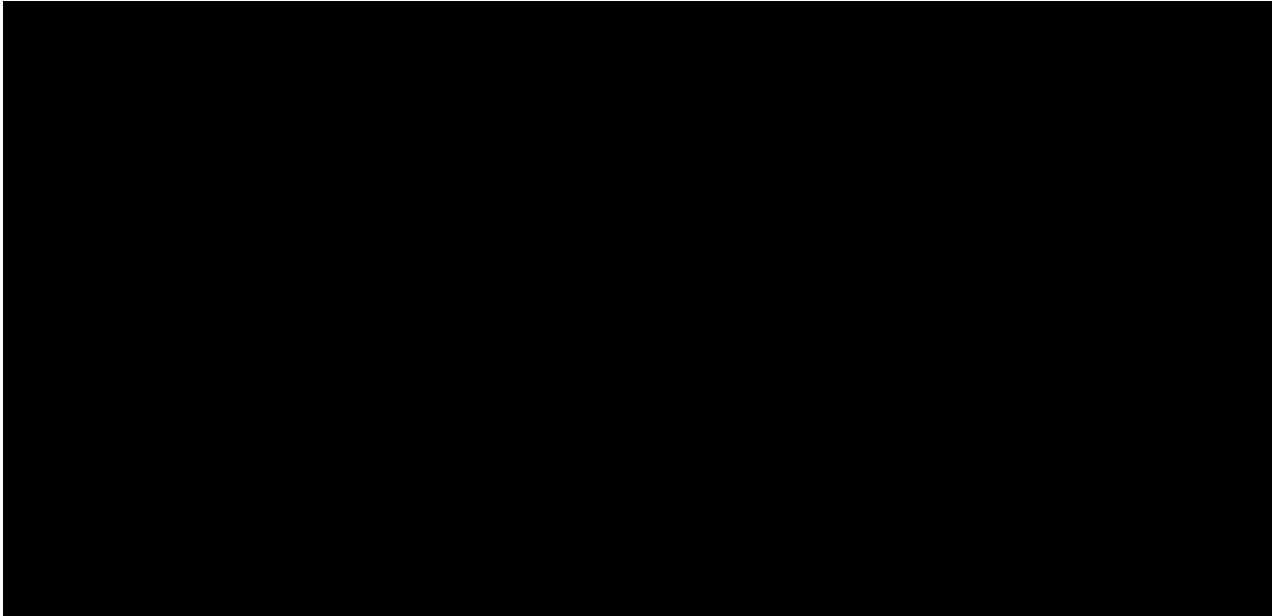


**Figure V-5: Confidential WACOG Results, Rate Areas 1, 2 (Nov 2021-March 2022)** [REDACTED]



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[REDACTED]  
[REDACTED]

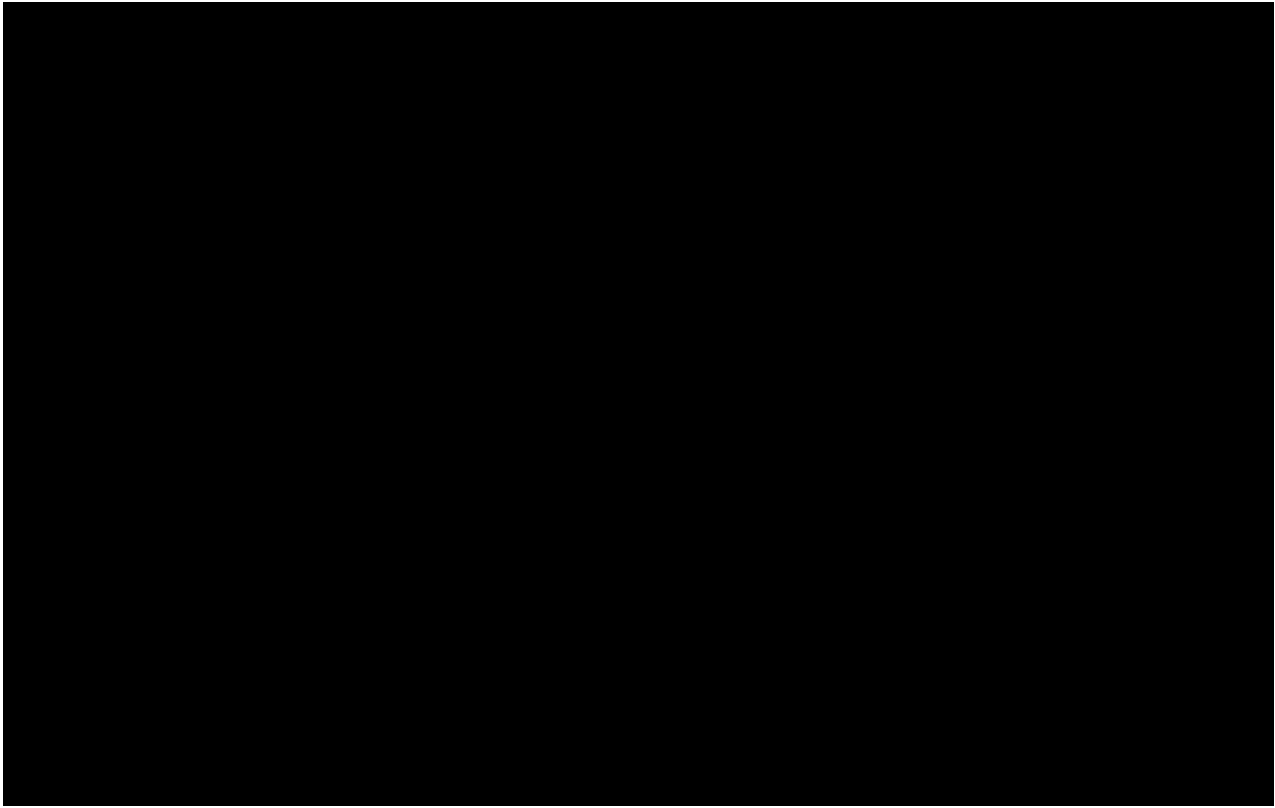
**Figure V-6: Confidential WACOG Results, Rate Areas 1, 2 (Nov-Dec 2022)** ■



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■ [Redacted]

**Figure V-7: Confidential WACOG Results, Rate Area 3 (Jan-March 2020)**

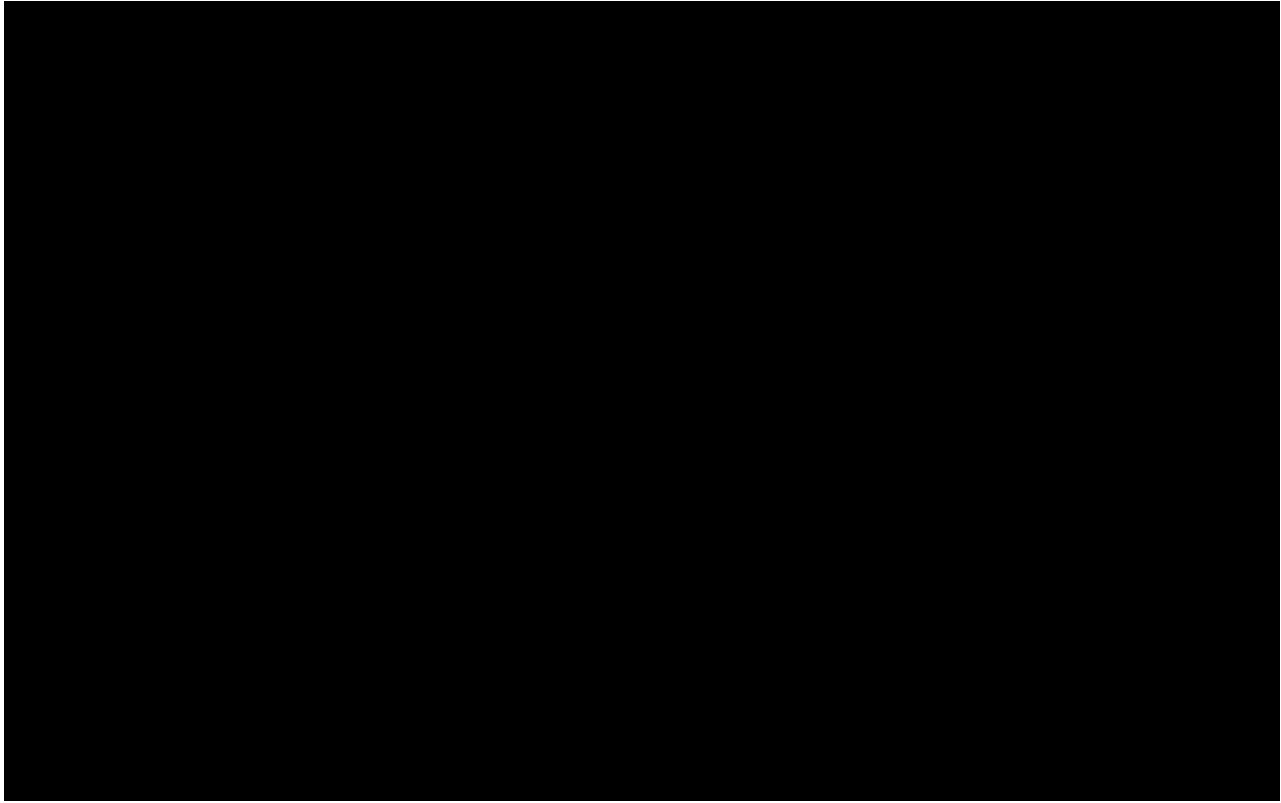


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■ [Redacted]

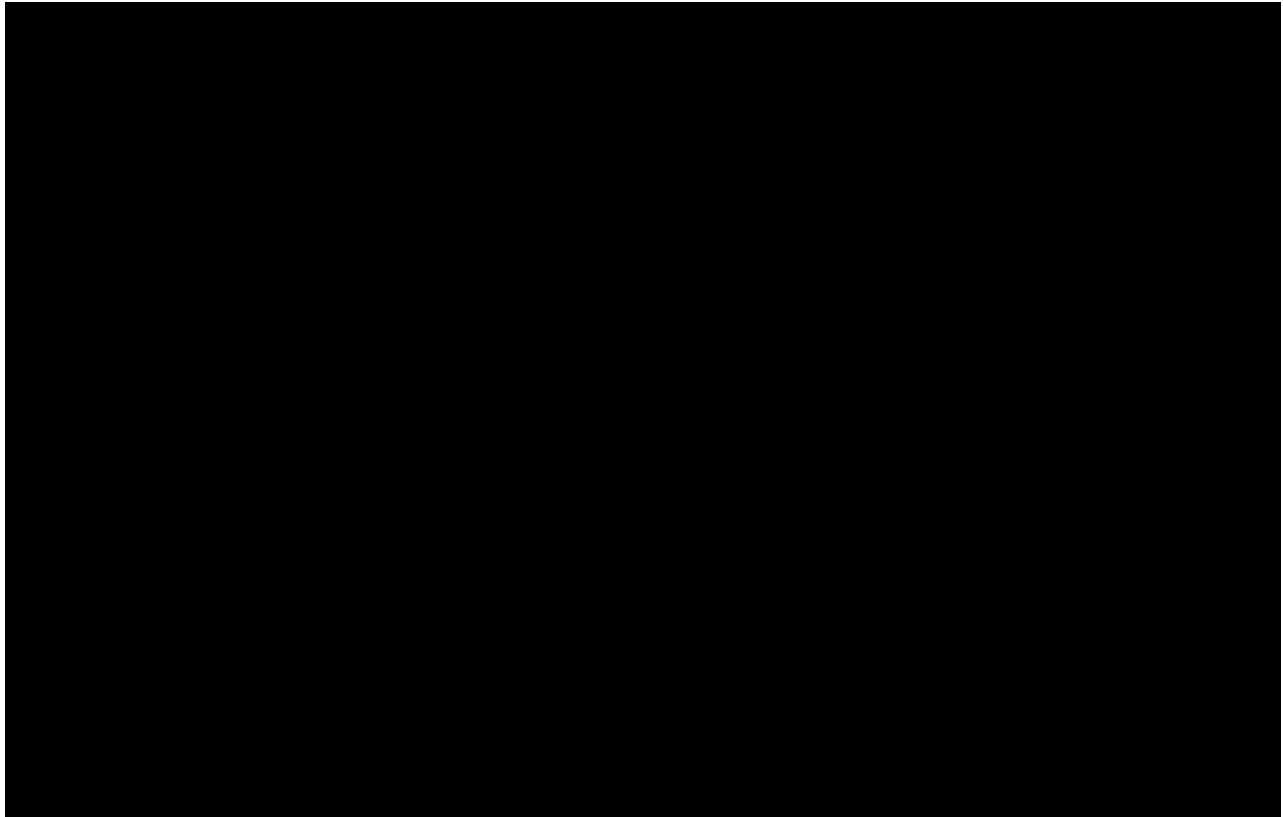


**Figure V-8: Confidential WACOG Results, Rate Area 3 (Nov 2020-March 2021)** ■



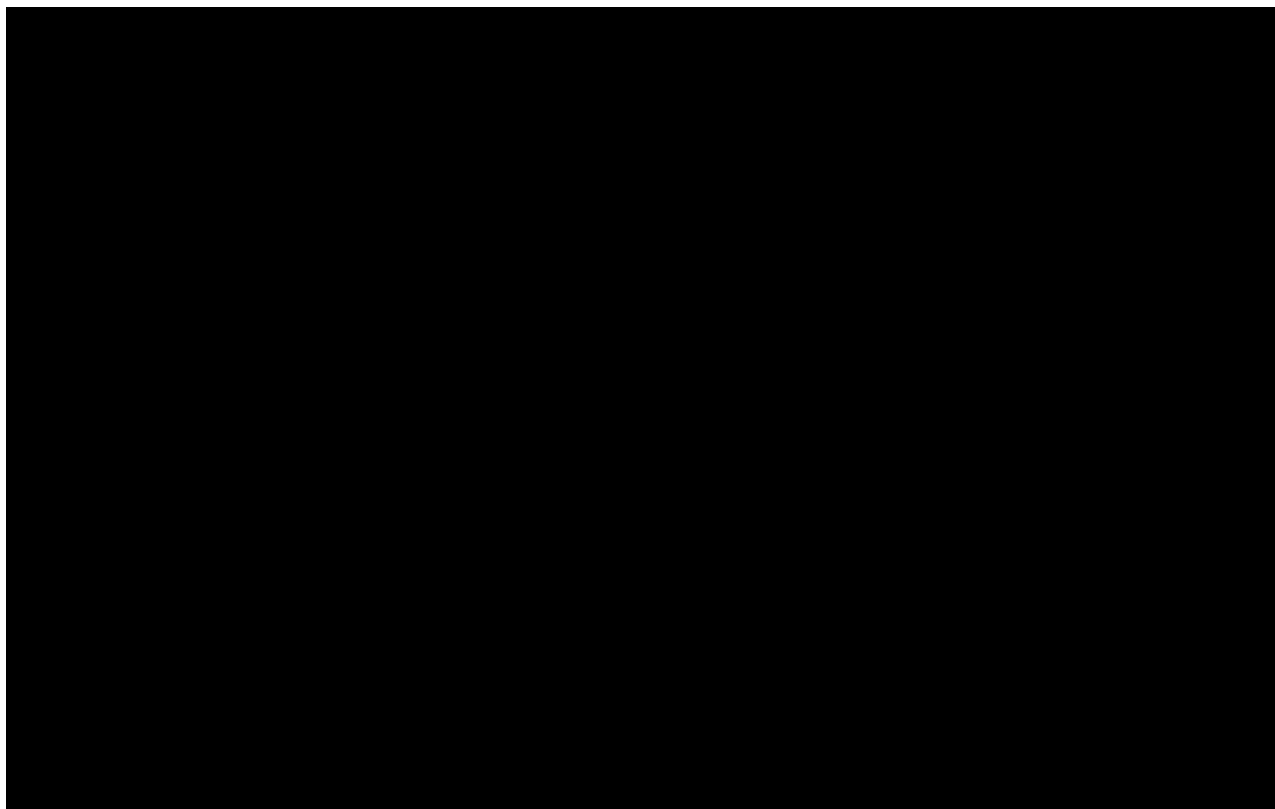
■ [Redacted text]

**Figure V-9: Confidential WACOG Results, Rate Area 3 (Nov 2021-March 2022)** ■



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■ \_\_\_\_\_

**Figure V-10: Confidential WACOG Results, Rate Area 3 (Nov-Dec 2022)** [REDACTED]



The WACOG results above show generally positive outcomes, at least as measured by the WACOG measure. For example, Figure V-4 shows that Nebraska Gas' hedged portfolio had a lower WACOG in every winter month compared with the other supply options available. Results aside, it is our view that the success of BHSC's hedging program should be also judged by its impact on portfolio *volatility*, not only cost. To do so would require a volatility measure. One such measure is "Value at Risk," or "VaR," which allows for an assessment of downside risk of a portfolio of assets. The VaR of a portfolio is the expected maximum loss over a specified time period (typically 1-2 days) at a specified confidence interval (typically 95%). VaR can be used to assess the riskiness of a portfolio and, coupled with clearly defined risk thresholds and parameters, can be used to take steps to adjust the portfolio if the portfolio VaR gets too high. BHSC indicated that it does not use the VaR methodology, but does monitor the mark-to-market value of its hedges and accounts for the net impact of that review.<sup>217</sup> BHSC also stated that it uses "what-if" scenarios to test their portfolio.<sup>218</sup> We include a recommendation that BHSC consider developing a volatility-based measure for assessing the impact of its hedging activities.

BHSC considers non-winter purchases of gas supply for storage injection to be hedged volumes because prices are fixed at summer prices. BHSC follows a [REDACTED] approach with generally

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[REDACTED]

<sup>217</sup> Request PSC-5-17(e).

<sup>218</sup> Request PSC-5-17(e).

████████ storage injections over the non-winter period. While this is a reasonable approach, during the summer of 2022 natural gas prices spiked to roughly \$8-\$9 MMBtu. While this level of summer prices is highly unusual, it is not unprecedented. During the non-winter months (May through October) of 2005-2008, NYMEX spot prices settled between roughly \$5-\$13/MMBtu, with July through September prices settling between \$5-\$11.75/MMBtu.<sup>219</sup> During this period, a number of non-winter settled prices exceeded settled winter prices. Consequently, we include a recommendation that BHSC consider alternatives to a strict hedging approach that relies exclusively on non-hedged ██████████ storage injections.

## V.B. Conclusions

**Conclusion V-1:** Nebraska Gas' objectives in natural gas planning are: (1) provide reasonably priced natural gas, (2) provide a high level of reliability, and (3) mitigate price volatility. These are reasonable objectives, and Nebraska Gas' hedging activity is aimed at balancing these objectives.

**Conclusion V-2:** BHSC hedges Nebraska Gas' exposure to gas price volatility through a combination of fixed-price physical gas supply contracts, gas storage arrangements, and financial contracts. For Rate Area 3 only, BHSC also purchases financial derivative contracts, specifically natural gas futures contracts and call option contracts.

**Conclusion V-3:** BHSC and Nebraska Gas have appropriately codified much of its approach to hedging, risk management, and use of derivative contracts in its written manuals.

**Conclusion V-4:** BHSC uses a ██████████ approach to its storage arrangements by injecting gas into storage on a ratable basis throughout the ██████████ (unimpacted by market price levels) and makes multiple term index purchases ██████████.

**Conclusion V-5:** BHSC's precise approach to hedging Nebraska Gas' exposure to natural gas prices differs by Rate Area, targeting ██████████ of the forecasted base case requirement for Rate Areas 1 and 2 and ██████████ of the forecasted base case requirement for Rate Area 3 due to differences in the availability of storage in the respective Rate Areas. The greater the target hedge percentage, the less volatile Nebraska Gas' costs (and customer rates) will be (though they will incur additional hedging costs). Given (a) the importance of hedge targets, (b) BHSC's consultant's recent finding that different hedge targets by Rate Area may raise equity concerns in the future, and (c) a review of the adequacy of the target hedge percentages were expressly not included in this audit scope and would necessarily require an assessment of the customer load profiles and weather sensitivity, we include a recommendation that future audits include a complete assessment of the specific hedge targets pursued by Nebraska Gas. (**Recommendation 2023-5**)

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<sup>219</sup> U.S. Energy Information Administration, Henry Hub Natural Gas Spot Price, <https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm>.

**Conclusion V-6:** Regarding the products used by BHSC for hedging purposes, all appear reasonable, commonly used approaches to mitigating exposure to natural gas price volatility.

**Conclusion V-7:** BHSC's use of fixed price supply contracts is also reasonable, particularly because these must-take agreements are not relied upon to excess.

**Conclusion V-8:** BHSC has sought to secure put options from [REDACTED] from which it is receiving physical, [REDACTED] fixed price gas. BHSC explained that suppliers have been hesitant to provide such an arrangement. Pursuit of such options is reasonable, though may be more likely offered by counterparties specializing in such products, such as financial counterparties.

**(Recommendation 2023-6)**

**Conclusion V-9:** BHSC's use of financial derivative contracts (Henry Hub futures and call options) is reasonable. The process may be improved by also hedging basis risk. BHSC has indicated it is in their plans for 2023-2024. **(Recommendation 2023-7)**

**Conclusion V-10:** BHSC employed a planned, consistent approach to hedging that was in line with its guidelines during the Audit Period.

**Conclusion V-11:** BHSC's hedging approach could reasonably incorporate market conditions and other key data about supply, demand, and overall storage levels in the timing of hedging transaction activity. While we make no recommendation on this point, hedging policy for a regulated utility is rarely one-size-fits-all since there are often multiple approaches that can yield the desired results. The strategy pursued is often the product of revision, lessons learned, and collaboration between the utility and its stakeholders and its regulators. Regulators should have some say and be aware of the approach being employed by its regulated utilities since ultimately the hedging activity is done on behalf of customers to prevent against rate shocks and overall price volatility.

**Conclusion V-12:** During the Audit Period, Nebraska Gas entered the winter season with actual hedge percentages reasonably within range of targets, particularly in the most recent winter (2022-2023).

**Conclusion V-13:** BHSC's approach to testing the effectiveness of its hedging program is to review and compare the performance of the hedged portfolio's WACOG against the unhedged WACOG portfolios that rely on indexed pricing. Generally, BHSC's hedging activity lowered WACOG for customers during the Audit Period.

**Conclusion V-14:** BHSC's hedging program would also be judged by its impact on portfolio volatility, not only cost. To do so would require a volatility measure. One such measure is "Value at Risk," or "VaR," which allows for an assessment of downside risk of a portfolio of assets. **(Recommendation 2023-8)**

**Conclusion V-15:** Relying on typically lower summer prices for its storage injections is a reasonable strategy. There are instances in the past, however, where settled summer spot prices during some months

exceeded settled winter spot prices. The most recent period where this occurred was the summer of 2022. While these conditions may not occur frequently, there may be opportunities to mitigate this exposure in the future for little or no cost. **(Recommendation 2023-9)**

## V.C. Recommendations

**Recommendation 2023-5:** Future audits of Nebraska Gas should include in its work scope a complete assessment of the target hedge percentages.

**Recommendation 2023-6:** In pursuing put and call options to hedge exposure to physical supply contracts, BHSC should consider contracting with counterparties that specialize in such products, such as financial counterparties.

**Recommendation 2023-7:** Black Hills should seek to hedge natural gas supply basis risk in its hedging activities, with due consideration given to cost-effectiveness and availability of suitable hedging instruments.

**Recommendation 2023-8:** Black Hills should consider use of a volatility measure to assess the effectiveness of its hedging activities.

**Recommendation 2023-9:** Black Hills should consider alternatives to a strict adherence to relying on non-hedged summer volumes for its storage injections.