

153 FERC ¶ 61,301
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Norman C. Bay, Chairman;
Cheryl A. LaFleur, Tony Clark,
and Colette D. Honorable.

National Fuel Gas Supply Corporation

Docket No. CP14-501-000

ORDER ISSUING CERTIFICATE

(Issued December 17, 2015)

1. On June 13, 2014, National Fuel Gas Supply Corporation (National Fuel) filed an application pursuant to section 7(c) of the Natural Gas Act (NGA)¹ and Part 157 of the Commission's regulations² for a certificate of public convenience and necessity authorizing National Fuel to convert Well 7451 from observation to withdrawal-only status, and to expand the reservoir and buffer boundaries of its Beech Hill, East Independence, and West Independence storage fields (collectively, Beech Hill Complex or Storage Complex), all located in Allegany and Steuben Counties, New York.³ For the reasons discussed below, and subject to the conditions herein, the Commission will issue National Fuel a certificate authorizing a portion of the proposed expansion area. We deny National Fuel's request to convert Well 7451 from observation to withdrawal-only status.

I. Background

2. National Fuel, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, is a natural gas company as defined by section 2(6) of

¹ 15 U.S.C. § 717(f) (2012).

² 18 C.F.R. pt. 157 (2015).

³ A small percentage of the buffer zone for the East Independence field is located in Steuben County, New York.

the NGA.⁴ National Fuel transports and stores natural gas in New York and Pennsylvania.

3. The Beech Hill Complex is located in the Towns of Alma, Andover, Willing, and Independence in Allegany County, New York, and the Town of Greenwood in Steuben County, New York. National Fuel stores gas in the Oriskany Sandstone, a former gas-producing layer contained above by the Onondaga Limestone and below by the Helderberg Limestone.⁵ The Commission issued a certificate to Penn-York Energy Corporation (Penn-York) and National Fuel authorizing the operation of Beech Hill and the adjacent East Independence and West Independence Storage Fields on February 4, 1987.⁶ On January 19, 1994, the Commission authorized the merger of Penn-York into National Fuel,⁷ and National Fuel has since owned and operated the three former Penn-York storage fields.

4. In 2002, the Commission issued an order (2002 Order)⁸ authorizing the redefinition of the certificated boundary of Beech Hill, including the addition of an area to the southwest of the field referred to as the Beech Hill Annex. The 2002 Order also authorized National Fuel to use seven existing wells within the Beech Hill Annex to withdraw migrated storage gas.

5. In 2006, the Commission issued an order (2006 Order)⁹ authorizing the conversion of two observation wells to withdrawal wells at the Beech Hill Annex and the construction of associated field pipelines to connect the wells to the existing pipeline system. However, during the process of converting the observation wells to withdrawal wells, National Fuel determined that the wells were not suitable for withdrawal purposes.

⁴ 15 U.S.C. § 717a(6) (2012).

⁵ National Fuel clarifies in its application that there is currently an insufficient basis to include the Marcellus Shale as protective caprock based on the characteristics of the Marcellus Shale compared to the Onondaga Limestone and the thin and shallow nature of the Marcellus Shale in the area.

⁶ *Penn-York Energy Corp. and National Fuel Gas Supply Corp.*, 38 FERC ¶ 61,135 (1987).

⁷ *Penn-York Energy Corp. and National Fuel Gas Supply Corp.*, 66 FERC ¶ 61,093 (1994).

⁸ *National Fuel Gas Supply Corp.*, 100 FERC ¶ 61,305 (2002).

⁹ *National Fuel Gas Supply Corp.*, 116 FERC ¶ 62,240 (2006).

Accordingly, the wells were never placed into service and the associated field pipelines were not constructed.

6. National Fuel states that since 2006, it has revised its geologic interpretation of the Beech Hill, West Independence, and East Independence storage fields in response to additional well evaluation and testing and the acquisition of seismic data. National Fuel asserts that in 2008, Pennsylvania General Energy Corporation (PGE) began producing gas from its Well API# 31-003-25286-00-00 (National Fuel Well 7451), located approximately 8,000 feet south of the existing reservoir boundary of Beech Hill. National Fuel claims that geochemical analysis from June 2010 shows that gas produced from Well 7451 was comprised of 65 percent storage gas.¹⁰

7. In September 2012, National Fuel filed an application in Docket No. CP12-525-000 seeking authorization to withdraw gas from Well 7451 during the 2012-2013 withdrawal season, and to treat the output of the well as a storage withdrawal and utilize the well in providing service to its customers.¹¹ In its application, National Fuel further explained that it would be beneficial to place Well 7451 in operation on an interim basis to: (1) assess the daily flow capacity of the well; (2) calculate the original gas in place in the structure penetrated by the well using actual gas withdrawn and associated pressures during the season; and (3) help quantify the number of development wells needed in that structure to efficiently turn its top gas.¹² Commission authorization of National Fuel's proposal was granted in an order dated December 19, 2012 (2012 Order).¹³

8. National Fuel further states that, as described in its application in Docket No. CP12-525-000, it conducted additional seismic studies in an area to the south of the Beech Hill field to verify the extent of the gas-bearing geologic structure in that location. In addition, National Fuel has further evaluated the base and cap rock surrounding the Beech Hill, East Independence, and West Independence fields.

¹⁰ National Fuel states that it acquired Well 7451 and related interests from PGE in June 2011.

¹¹ National Fuel Abbreviated Application, Docket No. CP12-525-000 (filed Sept. 18, 2012).

¹² *Id.* at 4.

¹³ *National Fuel Gas Supply Corp.*, 141 FERC ¶ 62,212 (2012).

II. Description of Proposal

9. National Fuel proposes to expand the existing reservoirs and buffer zones of the Beech Hill Complex by a total of 12,953.7 acres, based upon its revised geologic interpretation of the Oriskany sandstone. National Fuel proposes to expand the storage reservoirs by 8,299.02 acres and the protective buffer zones by 4,654.67 acres in seven distinct areas, as denoted in Table 1 below.¹⁴ The proposed expansion would increase the Beech Hill Complex from 14,548 to 27,501.7 total acres, as shown in Table 2 below.

Table 1	Field	Reservoir Expansion (acres)	Buffer Expansion (acres)	Total
Area 1	Beech Hill Annex	0	16.09	16.09
Area 2	East Independence	32.55	148.23	180.78
Area 3	Beech Hill	1,199.73	1,772.6	2,972.33
Area 4	Beech Hill	490.19	308.48	798.67
Area 5	West Independence	391.71	707.39	1,099.1
Area 6	Beech Hill	5,123.06	990.34	6,113.4
Area 7	Beech Hill	1,061.78	711.54	1,773.32

Table 2	Existing Acreage	Additional Acreage	Total Acreage
Beech Hill Pool ¹⁵	3,506.8	7,874.8	11,381.5
Beech Hill Buffer	4,345.9	3,799.1	8,145.0
East Independence Pool	656.7	32.6	689.3
East Independence	1,959.5	148.2	2,107.7

¹⁴ Our analysis of the proposed expansion areas follows in the Discussion section.

¹⁵ The addition of Areas 6 and 7 of the Beech Hill reservoir and buffer would extend the field into a portion of Potter County, Pennsylvania.

Buffer			
West Independence Pool	1,200.3	391.7	1,592.0
West Independence Pool	2,878.8	707.4	3,586.2
Total Acreage	14,548.0	12,953.7	27,501.7

10. National Fuel states that its modified geologic interpretation demonstrates the need to revise the reservoir and buffer boundaries of the three fields in the seven distinct areas, as follows:¹⁶

- a. Area 1: National Fuel seeks to modify the reservoir and buffer zone boundaries of the Beech Hill Annex based on the results of work performed on wells in this area;
- b. Area 2: National Fuel seeks to increase the reservoir and buffer boundaries of its East Independence field based on analysis of recent seismic data;
- c. Area 3: National Fuel seeks to expand the reservoir and buffer boundaries along the northern side of the southwestern part of the Beech Hill field to include faults it believes form a gas migration pathway between Beech Hill and the Beech Hill Annex;
- d. Area 4: National Fuel seeks to extend the reservoir and buffer boundaries along the southern side of the northeastern portion of the Beech Hill field based on well tests, wellhead pressures, and the log results of wells in the area;
- e. Area 5: National Fuel seeks to expand the reservoir and buffer boundaries along the northern side of its West Independence field to include a closed structure, as defined by recent seismic data;

¹⁶ National Fuel filed substantial data in Exhibits Z-1, Z-2 and Z-3, as well its responses to Commission requests for additional information, as “Privileged Information – Do Not Release.”

f. Area 6: National Fuel seeks to expand the reservoir and buffer boundaries to include the area located south of the Beech Hill field. This area includes Well 7451, which National Fuel asserts has been in geologic communication with the storage fields based upon geochemical fingerprinting; and

g. Area 7: National seeks to further expand the reservoir and buffer boundaries of the Beech Hill field in this area, which lies south and adjacent to Area 6, and is similar to the structure of Area 6, as defined by seismic data.

11. Finally, National Fuel seeks authorization to use Well 7451 as a withdrawal-only well in order to allow it to recover migrated storage gas by direct withdrawal. National Fuel states that converting the well to withdrawal-only status will not require any construction except for the installation of an above-ground water separator under section 2.55(a) of the Commission's regulations.¹⁷

12. National Fuel states that it does not seek approval to change the capacity or deliverability of the fields. National Fuel explains that if any adjustments to certificated quantities are warranted after further operation of Well 7451, it will seek additional authorization from the Commission.

III. Notice, Interventions, and Protests

13. Notice of National Fuel's application was published in the Federal Register on June 30, 2014.¹⁸ The parties listed in Appendix A filed timely, unopposed motions to intervene. Timely, unopposed motions to intervene are granted by operation of Rule 214 of the Commission's Rules of Practice and Procedure.¹⁹

14. Dominion Transmission, Inc. filed a timely motion to intervene and comments on July 15, 2014, but withdrew the intervention and comments on October 3, 2014. Aaron Mullen, ESQ, submitted a comment but did not file a motion to intervene.

15. Blair and Deborah Buchholz, Kevin Fanton, Lauren and Kelley Fanton, Darido and Necia Bishop, Donald B. Fanton, Jolee Fanton, and Myron D. Fanton filed late motions to intervene and comments or protests in opposition to National Fuel's proposal.

¹⁷ 18 C.F.R. § 2.55(a) (2015). Section 2.55(a) excludes certain auxiliary installations from the definition of "facilities" as used in section 7(c) of the NGA.

¹⁸ 79 Fed. Reg. 36,796.

¹⁹ 18 C.F.R. § 385.214(c) (2015).

We find that the late intervenors have a direct and substantial interest in the proceeding and that granting the motions at this stage will not cause undue delay or disruption, or otherwise prejudice the applicant or other parties. Accordingly, we grant the motions for late intervention.²⁰

16. The intervenors and other landowners filing comments or protests in opposition to National Fuel's proposed project raise concerns primarily related to property and/or mineral rights in the proposed expansion areas, cap rock designation, and access to proprietary geologic information. National Fuel filed answers to the cap rock and geologic data concerns on August 11, 2014 (August 2014 Response).²¹

IV. Discussion

17. Because National Fuel seeks certificate authority to enlarge its Beech Hill Complex used for the storage of natural gas in interstate commerce subject to the Commission's jurisdiction, the proposal is subject to the requirements of subsections (c) and (e) of section 7 of the NGA.²²

A. Certificate Policy Statement

18. The Certificate Policy Statement provides guidance for evaluating proposals to certificate natural gas facilities.²³ The Certificate Policy Statement established criteria for determining whether there is a need for a proposed project and whether the proposed project will serve the public interest. The Certificate Policy Statement explains that in deciding whether to authorize the expansion of natural gas facilities, the Commission balances the public benefits against the potential adverse consequences. The Commission's goal is to give appropriate consideration to the enhancement of competitive transportation alternatives, the possibility of overbuilding, subsidization by existing customers, the applicant's responsibility for unsubscribed capacity, the

²⁰ See 18 C.F.R. § 385.214(d) (2015).

²¹ Although the Commission's Rules of Practice and Procedure do not permit answers to protests, the Commission finds good cause to waive Rule 213 to admit National Fuel's pleadings, as they have provided the Commission with information that has assisted us in our decision making process. 18 C.F.R. § 385.213(a)(2) (2015).

²² 15 U.S.C. §§ 717(b), 717f(c), (e) (2012).

²³ *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227, at 61,748 (1999); *clarified*, 90 FERC ¶ 61,128 (2000); and *further clarified*, 92 FERC ¶ 61,094 (2000) (Certificate Policy Statement).

avoidance of unnecessary disruptions of the environment, and the unneeded exercise of eminent domain.

19. Under this policy, the threshold requirement for applicants proposing new projects is that the applicant must be prepared to financially support the project without relying on subsidization from its existing customers. The next step is to determine whether the applicant has made efforts to eliminate or minimize any adverse effects the project might have on the applicant's existing customers, existing pipelines in the market and their captive customers, or landowners and communities affected by the route of the new pipeline. If residual adverse effects on these interest groups are identified after efforts have been made to minimize them, the Commission will evaluate the project by balancing the evidence of public benefits to be achieved against the residual adverse effects. This is essentially an economic test. Only when the benefits outweigh the adverse effects on economic interests will the Commission proceed to complete the environmental analysis where other interests are considered.

20. As stated above, the threshold requirement for applicants proposing new projects is that the applicant must be prepared to financially support the project without relying on subsidization from its existing customers. However, the Certificate Policy Statement also provides that existing customers should pay for the costs of projects designed to improve their service, such as projects to replace existing capacity, improve reliability, or provide additional flexibility. Under the Certificate Policy Statement, increasing the rates of existing customers to pay for these types of improvements does not constitute a subsidy, and the costs of such projects are permitted to be rolled into system-wide rates.²⁴

21. National Fuel did not include any cost information in its filing because it is not proposing to construct new facilities. However, National Fuel states that it expects to incur costs associated with acquiring property rights in the proposed expansion areas. Therefore, National Fuel requests a predetermination that it may roll in reasonable project costs in its next section 4 rate case proceeding.

22. As discussed below, authorizing the limited expansion of the Beech Hill Complex's certificated reservoir and buffer boundaries, subject to the conditions set forth in this order, will enable National Fuel to protect the integrity of the storage field and will improve service for National Fuel's existing customers by increasing the reliability of its storage services. Thus, the Commission concludes that it is appropriate to allow National Fuel to roll reasonable project costs into its system-wide rates in its next NGA section 4 rate proceeding, absent a significant change in circumstances. However, National Fuel's customers will have the opportunity to examine the prudence of the level of costs that National Fuel seeks to recover through their rates in that future

²⁴ Certificate Policy Statement, 88 FERC ¶ 61,227 at 61,747, n.12.

proceeding. Thus, National Fuel should keep separate, detailed records of all the costs associated with the Beech Hill Complex expansion.

23. The limited expansion of the Beech Hill Complex's reservoir and buffer zones will not affect the certificated operational parameters of the storage field, nor will it degrade any existing service provided by National Fuel. Further, National Fuel's proposal will have no adverse impact on other pipelines or their customers. Additionally, no pipeline or their customers protested the application.

24. The intervening parties have raised issues regarding the impact of National Fuel's proposal to extend the Beech Hill Complex's boundaries on surrounding landowners and communities. Ten intervening parties raised issues regarding the extent of privileged information contained in National Fuel's application, asserting either that the application should be considered incomplete or that it cannot be challenged because Exhibit Z is filed as privileged.

25. We note that National Fuel initially filed only approximately two pages of public geologic information in its application (pages 4-6) regarding its proposed 12,953.7 acre expansion. The majority of geologic and engineering data on which the Commission bases its decision in this proceeding was filed as privileged in Exhibits Z-1 and Z-2. Further, data requests seeking additional geologic and engineering data to assist our analysis were largely filed in redacted versions, with little to no publicly-available geologic or engineering data.

26. Section 388.112(b)(1) of the Commission's regulations requires parties filing information as privileged to file a public version with the information claimed to be privileged material redacted to the extent practicable.²⁵ Additionally, section 388.112(b)(2) states that parties filing privileged information in proceedings with a right to intervene must file a proposed form of protective agreement. Section 388.112(b)(2) also provides rules for how parties to the proceeding may access the privileged information. National Fuel's June 13, 2014 application did not comply with section 388.112 with respect to filing public, redacted versions of its Exhibits Z-1 and Z-2²⁶ or a protective agreement.

27. On July 31, 2015, National Fuel filed a public version of Exhibit Z-1, Geological Report, and a proposed form of protective agreement detailing procedures by which interested parties could access the privileged information, in compliance with section 388.112 of the Commission's regulations. On September 21, 2015, the Commission

²⁵ 18 C.F.R. § 388.112(b)(1) (2015).

²⁶ Exhibit Z-2 contained facility maps, which are not practicable to redact.

issued a data request asking National Fuel to provide documentation and the date that all of the parties that filed comments regarding Exhibit Z-1 were provided the form of protective agreement. The data request also required National Fuel to provide the dates that all protective agreements were executed, as well as the date the privileged version of Exhibit Z-1 was provided to the requesting party.

28. On September 28, 2015, National Fuel filed its response indicating that it mailed the proposed form of protective agreement to the affected parties and received three requests for access to the non-public materials and/or the protective agreement.²⁷ Protective agreements were executed with each of the three parties, one on September 22, 2015, and two on September 28, 2015. National Fuel then arranged access to the protected materials for the three parties. As of December 17, 2015, no additional comments have been filed in this proceeding by any of the intervening parties.

29. Donald and M'Lissa Sugden (Sugdens) assert that wells that may be associated with National Fuel's proposed expansion could negatively impact their drinking water wells. National Fuel is proposing no additional facilities or services at the Beech Hill Complex. In fact, National Fuel's proposal would limit potential additional third-party drilling in the Oriskany Sandstone within the acreage authorized by this order. Accordingly, National Fuel's proposal would not negatively impact drinking water wells in the area.

30. Aaron Mullen, ESQ, seeks clarification of how National Fuel's proposal will affect landowner rights. In particular, Mr. Mullen requests an explanation as to whether landowners will be able to drill into the Marcellus Shale if National Fuel's proposal is authorized. In its August 11, 2014 Answer to filed comments, National Fuel states that, "[It] is not seeking to identify the Marcellus Shale as part of the caprock for Beech Hill, East Independence and West Independence in this proceeding." National Fuel further states that, "If at some future time additional information indicates that the caprock should include the Marcellus Shale, National Fuel would seek appropriate certificate authorization from the Commission. While the prospect of Marcellus Shale drilling within the proposed map area is speculative, National Fuel would monitor any drilling activities to guard against damage to the Onondaga or Oriskany formations."²⁸

²⁷ National Fuel filed an updated response to the data request on October 28, 2015.

²⁸ We note that on December 17, 2014, the State of New York announced a state-wide ban on hydraulic fracturing, which was subsequently formalized on June 29, 2015. Hydraulic fracturing has been prohibited in New York since the state imposed a moratorium in 2008.

31. In addition to Mr. Mullen's concerns regarding just compensation, fourteen affected landowners seek reassurance that National Fuel will compensate property owners appropriately if recoverable natural gas is confirmed within the Oriskany Sandstone. The Commission addresses the technical arguments below, but notes that issues related to landowner compensation for mineral rights will be addressed either through negotiation of storage leases or easements with National Fuel, or through the eminent domain process in state or federal court.²⁹ Through the eminent domain process, the value of any native gas will be taken into account by a court in deciding the appropriate value of each individual landowner's mineral and property rights.

32. Under the Certificate Policy Statement, the Commission will not issue a certificate of public convenience and necessity authorizing a project, with the associated right to obtain the necessary property rights, unless the Commission finds that the project is in the public interest, and that the overall public benefit outweighs any potential adverse impacts. The Commission has recognized that underground natural gas storage fields are an essential part of the natural gas infrastructure. Natural gas storage is critical in ensuring that overall demands and specific requirements of natural gas customers are met. National Fuel has a responsibility to protect the natural gas that its customers have entrusted to it to store for them in the storage fields comprising the Beech Hill Complex and, to that end, has a responsibility to maintain the integrity of the storage reservoir.

33. The Commission has balanced the interests of all parties to the proceeding, and finds that any potential impact to the interests of the property rights owners is outweighed by the substantial public benefits associated with a safe and secure Beech Hill Complex. Accordingly, in view of the above considerations, and as further supported below, the Commission finds that, consistent with the Certificate Policy Statement and section 7 of the NGA, approval of the limited expansion of the Beech Hill Storage Complex's reservoir(s) and buffer zone(s) is in the public convenience and necessity.³⁰

²⁹ Under section 7(h) of the NGA, 15 U.S.C. § 717f (2012), a certificate of public convenience or necessity confers on the certificate holder the right to acquire property rights by exercising the right of eminent domain in a court action if the certificate holder cannot acquire the property rights by contract or is unable to agree with the property owner on the amount of compensation. It is incumbent upon the applicant to make good faith efforts to negotiate with landowners for any needed rights. However, if the parties cannot reach agreement, issues of compensation for land taken by a pipeline under the eminent domain provisions of the NGA are matters for state or federal court.

³⁰ See *Southern Star Central Gas Pipeline, Inc.*, 115 FERC ¶ 61,219 (2006).

B. Analysis of Proposal

34. There is inherent uncertainty regarding the performance of underground storage reservoirs. Because the actual boundaries of an underground reservoir depend on characteristics that can generally be confirmed only after the facility has commenced operation, it is not unusual to find that the certificated boundaries of an underground reservoir do not confine gas volumes as anticipated. In such cases, to ensure the integrity of the storage reservoir and the efficient operation of the storage facility, the Commission typically either revises a storage facility's certificated boundaries to conform to the enlarged contours of the actual underground reservoir³¹ or alters the operating parameters of the storage facility to prevent gas from migrating beyond the facility's certificated boundaries.³²

35. The Commission grants jurisdictional storage field operators additional certificate authority to revise the boundary of storage fields when the applicant can demonstrate, with engineering and geological data, that such authorization is required by the public convenience and necessity in order to improve the operation of the storage field or to maintain its integrity.³³ In deciding whether the public convenience and necessity requires approval of a company's request to enlarge its storage boundary due to gas migration problems, a material consideration is whether the storage reservoir has expanded and whether the company's estimations of the reservoir and protective boundaries are reasonable.³⁴

³¹ See, e.g., *Williston Basin Interstate Pipeline Co.*, 127 FERC ¶ 61,045 (2009); *Dominion Transmission, Inc.*, 100 FERC ¶ 61,168 (2002); *Williams Natural Gas Pipelines Central, Inc.*, 83 FERC ¶ 61,120 (1998); *Williams Natural Gas Co.*, 77 FERC ¶ 61,150 (1996); *ANR Pipeline Co.*, 76 FERC ¶ 61,263 (1996), *reh'g denied*, 78 FERC ¶ 61,122 (1997); *Columbia Gas Transmission Corp.*, 35 FERC ¶ 61,345 (1986).

³² See, e.g., *Equitrans, L.P.*, 119 FERC ¶ 61,287 (2007), in which the Commission set maximum inventory and pressure parameters at levels to ensure the integrity of storage reservoirs and minimize gas migration.

³³ See *Williams Natural Gas Pipelines Central, Inc.*, 83 FERC ¶ 61,120 (1998); *Williams Natural Gas Co.*, 77 FERC ¶ 61,150 (1996); *ANR Pipeline Co.*, 76 FERC ¶ 61,263 (1996), *reh'g denied*, 78 FERC ¶ 61,122 (1997); and *Columbia Gas Transmission Corp.*, 35 FERC ¶ 61,345 (1986).

³⁴ See *ANR Pipeline Co.*, 76 FERC ¶ 61,263, at 62,346 (1996).

36. National Fuel provided information demonstrating that: (1) there are few wells located outside the existing buffer boundary and within the proposed expansion areas from which to obtain gas samples for geochemical analysis; (2) based upon the geochemical analysis conducted on gas samples obtained in September 2014 (September 2014 analysis), there is little data to support significant storage gas migration from the storage reservoir, and into proposed expansion Areas 1–5; (3) the September 2014 analysis indicates that other than Well 7451 in Area 6, only Well SC-539 in Area 3 and well SC-542 in Area 4 definitively exhibited storage gas that had migrated beyond the certificated buffer zone for the Beech Hill Complex; (4) when not in a production/withdrawal state, wellhead pressures in Well 7451 do not appear to follow injection/withdrawal cycles; and (5) when actively withdrawing gas, Well 7451 could induce storage gas flow through a geologic pathway and toward Well 7451.

37. Based upon these findings, the Commission will authorize a portion of the requested reservoir and buffer boundary expansion of the Beech Hill Complex, as conditioned below.

1. Background

38. The Beech Hill Complex is located on the Smethport Anticline³⁵ in the Allegheny Plateau Province of the northern Appalachian Basin. Natural gas is stored in the Oriskany Sandstone, which trends on a northeast-southwest basis.³⁶ In the Smethport Anticline gas fields, natural gas accumulation is controlled by structural dip, faulting, and changes in porosity and permeability within the Oriskany Sandstone.

39. The Oriskany Sandstone is a medium-grained sandstone with an average thickness of 30 feet throughout the Storage Complex. In general, the porosity and permeability of the Oriskany Sandstone is higher on structural highs, while lower porosity and permeability is found lower in the structure, likely impeding gas movement.

40. Stratigraphically situated immediately above the Oriskany Sandstone is the Onondaga Limestone. The Onondaga Limestone is further overlain by Marcellus Shale, which averages a thickness of approximately 70 feet throughout the site. National Fuel states that Marcellus Shale is significantly thinner and shallower in this area than in areas

³⁵ An anticline is upfolded rock strata.

³⁶ Other natural gas storage fields associated with the Smethport Anticline include the Sharon Pool, located southwest of the Beech Hill Complex in Potter County, Pennsylvania and the Greenwood Pool, located northeast of the Beech Hill Complex in Steuben County, New York.

currently being drilled and produced in Pennsylvania. Immediately below the Oriskany Sandstone lies the hard, dense limestone of the Helderberg Group.

2. Technical Analysis

a. Revision of the Reservoir and Buffer Boundaries

41. National Fuel proposes to expand the existing reservoir and buffer acreage at its Beech Hill Complex by 12,953.7 acres in seven distinct areas. Staff reviewed each of the seven proposed expansion areas independently to determine whether the storage reservoir has expanded and whether National Fuel's estimations of the reservoir and protective boundaries are reasonable, based on the geologic and engineering data in the record. We conclude that National Fuel has demonstrated with geologic and engineering data³⁷ that some, but not all, of the proposed reservoir and buffer zone expansion is warranted, as discussed below. Attachment 1 to this order depicts the revised reservoir and buffer boundaries approved in this order. National Fuel is required to provide the additional reservoir and buffer acreage authorized for the East Independence, West Independence, and Beech Hill Storage Fields (i.e., revise Tables 1 and 2 above), based on the modified reservoir and buffer boundaries depicted in Attachment 1.

i. Area 1

42. National Fuel proposes to modify the reservoir and buffer boundaries of the Beech Hill Annex based upon work performed in existing wells in the area.³⁸ Specifically, National Fuel proposes to enlarge its reservoir boundary to include Observation Well SC-502, which is currently located in the buffer zone, according to the maps provided in Exhibit Z-2 of National Fuel's application. National Fuel states that its request to include the observation well in the reservoir boundary is based on its desire to include wells that have significant wellhead pressure and storage gas.

43. The 2002 Order authorized the establishment of the 2,115-acre Beech Hill Annex as an active storage reservoir with no additional buffer boundary. However, the maps provided in Exhibit Z-2 of National Fuel's application depict the 2,115 acres comprising the Beech Hill Annex as consisting of both reservoir and buffer boundaries. Based on our review of the record, a buffer zone has never been authorized for the Beech Hill

³⁷ Such data includes gas geochemical composition from thirteen wells from the September 2014 analysis.

³⁸ The existing boundaries of the Beech Hill Annex were established in the 2002 Order.

Annex.³⁹ Therefore, we now authorize a buffer boundary for the Beech Hill Annex within the boundary of the expansion approved in the 2002 Order. National Fuel is directed to provide the acreage of the storage reservoir and buffer boundary of the Beech Hill Annex, as described below and depicted in Attachment 1.

44. Staff analysis of wellhead pressure data compared Well SC-502 to the Indicator Well⁴⁰ for the Beech Hill Annex, SC-495, and concludes that, despite the significant pressure differential, there is a hydraulic correlation between the two wells. Additionally, in its April 20, 2015 data response, National Fuel provided data indicating that gas from Well SC-502 contained a percentage of storage gas as determined by the September 2014 analysis. Since there appears to be a slight hydraulic correlation between Well SC-502 and Well SC-495, and since some storage gas has migrated beyond the existing reservoir boundary as interpreted by National Fuel, we approve National Fuel's proposal to modify the reservoir boundary to include Well SC-502.

45. National Fuel also requests authorization to increase what it has designated on the maps provided in Exhibit Z-2 of its application as buffer zone in Area 1 by 16.09 acres, which would extend beyond the expansion boundary approved in the 2002 Order. However, National Fuel provided no data or explanation to support expanding the buffer boundary in Area 1 beyond that boundary. Therefore, National Fuel's request is denied.

ii. Area 2

46. Based upon recent seismic analysis, National Fuel requests authorization to expand the reservoir boundary of the East Independence field by 32.55 acres, and the buffer boundary by 148.23 acres, to the northeast in order to align with its reinterpreted elongated structure of the Oriskany Sandstone. The Oriskany Sandstone in Area 2 dips

³⁹ The 2002 Order states, “[W]e are not here approving any new buffer zone; rather, we are merely describing and authorizing for storage purposes the boundary where the pool of gas is actually located at this time.” 100 FERC ¶ 61,305, at P 11. The 2006 Order, in approving the conversion of Wells SC-517 and SC-519 to withdrawal wells, required National Fuel to submit, within two injection/withdrawal seasons after the wells were placed into service, “an application with supporting documentation to amend the certificated storage boundaries and propose buffer zone boundaries for both the Beech Hill and beech Hill Annex as applicable.” Because the wells were not ultimately converted, National Fuel never submitted an application to amend the certificated storage reservoir and propose buffer zone boundaries for the Beech Hill Annex.

⁴⁰ National Fuel identified specific Indicator Wells for the various storage fields within the Beech Hill Storage Complex. The engineering and geologic properties of the Indicator Wells are generally representative of the individual storage fields.

gently to the northeast toward a fault located within the currently-certificated buffer boundary, which would be partially included within the northeast extreme of National Fuel's proposed reservoir boundary for Area 2.

47. In order to determine whether or not storage gas is migrating beyond the existing certificated boundary, staff requested geochemical analysis of gas from observation Well EC-537, located approximately 2,000 feet northeast of the existing certificated boundary and within the existing buffer boundary.⁴¹ However, National Fuel was unable to provide the requested geochemical analysis.

48. Because Well EC-537 is located within the existing buffer boundary and National Fuel was unable to provide a geochemical analysis or other evidence confirming the presence of storage gas, storage gas migration does not appear to be an issue in Area 2. Additionally, the area is down dip on the elongated Oriskany structure, and has lower porosity and permeability that would provide a further barrier to gas movement. Based on this analysis, we will not authorize the full reservoir boundary expansion requested by National Fuel.

49. However, in order to align the reservoir boundary with the reinterpreted contours of the Oriskany sandstone and enhance the integrity of the storage reservoir in Area 2, we will authorize a portion of the requested reservoir boundary expansion to include the acreage northeast of East Independence's existing reservoir boundary, as depicted on Attachment 1. Further, we authorize revision of the East Independence buffer boundary to align with the revisions to the reservoir boundary approved in this order, as depicted on Attachment 1. We require National Fuel to provide the acreage of the additional authorized reservoir and buffer areas.

iii. Area 3

50. National Fuel seeks to expand the Beech Hill reservoir by 1,199.73 acres and buffer boundary by 1,772.6 acres along the northern side of the southwestern part of the Beech Hill field to include faults it believes form a gas migration pathway between Beech Hill and the Beech Hill Annex. A structural "saddle"⁴² lies between Beech Hill and the

⁴¹ Well EC-537 is located down dip from Well SC-564 within the Oriskany Sandstone. Well EC-537 is also located adjacent to the proposed reservoir boundary for Area 2.

⁴² A saddle is a structural low lying between two structural highs. If gas pressure in one of the structurally high areas is greater than the other structurally high area, gas has the potential to migrate from the higher pressure area, through the saddle, into the other structurally high area.

Beech Hill Annex. Two southwest-northeast trending faults situated adjacent and north of the existing Beech Hill Annex in the proposed reservoir expansion area extend into both the Beech Hill Annex and Beech Hill reservoirs.⁴³ The record indicates that the most likely gas migration pathway is through the saddle along or near the faults between the two fields. National Fuel presented no data to support gas migration into the proposed reservoir or buffer boundaries to the north of the faults near the saddle.

51. The two faults terminate to the northeast approximately 1,000 feet from Well SC-539, which lies within the existing reservoir buffer boundary and within the proposed reservoir boundary. The September 2014 analysis indicates that gas from Well SC-539 is storage gas.⁴⁴

52. Additionally, Storage Well SC-568, located approximately 2 miles northeast of Well SC-539 and within the buffer boundary adjacent to the existing Beech Hill reservoir boundary, contains storage gas.⁴⁵ Well SC-561, located in the existing Beech Hill buffer zone to the northwest of the Beech Hill reservoir, also showed evidence of storage gas in the mid-1990s.⁴⁶

53. Based upon the limited data available to support gas migration beyond Beech Hill's existing reservoir and buffer boundaries, we will limit the expansion of the Beech Hill reservoir in Area 3 to approximately align with National Fuel's existing buffer boundary, but modified to include Wells SC-561 and SC-539, as depicted on Attachment 1. We will authorize National Fuel's proposed reservoir boundary as the new buffer boundary. National Fuel is required to provide acreage of the newly authorized reservoir and buffer zones in Area 3, as shown on Attachment 1.

iv. Area 4

54. Based on well tests, wellhead pressures, and the log results of wells in the area, National Fuel seeks to extend the Beech Hill reservoir by 490.19 acres and the buffer boundary by 308.48 acres along the southern side of the northeastern portion of the Beech Hill field. Staff analysis of pressure data comparing Area 4 Indicator Well SC-467 to four observation wells in Area 4 shows a direct pressure relationship between the

⁴³ The northernmost fault is located approximately 1,000 feet south of the proposed reservoir boundary.

⁴⁴ April 20, 2015 data response.

⁴⁵ *Id.*

⁴⁶ *Id.*

existing Beech Hill reservoir and the proposed reservoir expansion area, indicative of hydraulic connection between the two areas. Further, the September 2014 analysis revealed that gas geochemistry of three of the four observation wells in the proposed reservoir expansion area was that of storage gas. Gas geochemistry from the fourth observation well contained a limited amount of storage gas.

55. Because National Fuel has provided data to demonstrate a hydraulic connection between the existing Beech Hill reservoir and the proposed reservoir expansion area, and additional data to support storage gas migration into the proposed expansion area, we authorize National Fuel's request to increase the Beech Hill reservoir by 490.19 acres and the buffer zone by 308.48 acres in Area 4, as depicted in Attachment 1.

v. Area 5

56. National Fuel seeks to expand the West Independence reservoir by 391.71 acres and the buffer boundary by 707.39 acres along the northern side of the field to include a closed structure as defined by recent seismic data. The closed structure consists of a structural high, approximately half of which is within the existing buffer zone of West Independence, and the other half outside of the existing buffer and aligning with the proposed reservoir expansion.

57. The September 2014 analysis determined that gas obtained from Well SC-546 was storage gas. Since National Fuel has demonstrated that storage gas has migrated beyond its existing West Independence reservoir boundary, but within its existing buffer boundary, we authorize National Fuel to expand its reservoir boundary as depicted in Attachment 1. Further, we authorize National Fuel to expand its buffer boundary to include the closed structure, as depicted in Attachment 1. We require National Fuel to provide the acreage of the authorized West Independence reservoir and buffer expansion areas.

vi. Area 6

58. National Fuel seeks to expand the Beech Hill reservoir by 5,123.06 acres and the buffer boundary by 990.34 acres to include the area located south of its Beech Hill field that includes Well 7451, which it asserts has been in geologic communication with the storage fields based upon geochemical fingerprinting. National Fuel believes that native gas was produced from Beech Hill Storage Well SC-468 through a geologic pathway connecting the Shongo pool, in which Well 7451 is located,⁴⁷ to the Beech Hill field,

⁴⁷ The gas pool in which Well 7451 is located is significantly structurally lower than the Beech Hill Storage Complex.

during the Beech Hill production era beginning in the 1940s and continuing for over 30 years.⁴⁸

59. National Fuel states that gas samples obtained from Well 7451 in 2010 indicated that gas from that well was 65 percent storage gas and 35 percent native gas. National Fuel purchased the well in 2011,⁴⁹ and produced gas for approximately four months in early 2013. A gas sample collected in February 2013 contained roughly the same 65 percent storage gas/35 percent native gas composition as the sample collected in 2010. The September 2014 analysis indicated that Well 7451 also contained 65 percent storage gas.

60. We are satisfied that National Fuel has demonstrated that storage gas is present in Well 7451. However, we believe the hydraulic connection between the two fields is weak. Data filed by National Fuel shows that Well 7451 does not appear to be influenced by the injection-withdrawal cycles at Beech Hill when Well 7451 is not in a withdrawal status, which is indicative of a weak hydraulic connection. Regardless of whether the hydraulic connection is strong or weak, there does appear to be a geologic connection between the Beech Hill storage field and the Oriskany Sandstone structure in which Well 7451 is located. In order to protect the structure in which storage gas is present from third party producers that could induce storage gas flow from the Beech Hill field, we authorize National Fuel to expand its Beech Hill buffer zone to include the Shongo pool where Well 7451 is located, as depicted on Attachment 1.

61. However, we do not believe that National Fuel's proposed reservoir and protective boundaries are reasonable. As previously stated, the Commission grants jurisdictional storage field operators additional certificate authority to revise the boundary of storage fields when the applicant can demonstrate, with engineering and geological data, that such authorization is required by the public convenience and necessity in order to improve the operation of the storage field or to maintain its integrity.

62. Based upon the data filed, the only well ever drilled into the proposed 5,123.06-acre reservoir expansion area is Well 7451. Geochemical analysis of gas from Well 7451 has remained constant at 65 percent storage gas from initial production in 2010 through National Fuel's withdrawal period in 2013 and September 2014 analysis. Further, the data filed does not indicate a strong hydraulic connection between the Beech Hill Storage Field and Well 7451. Other than its estimation of the areal extent of the Shongo pool and the geology of Area 6 based on its recent seismic interpretation, National Fuel provides

⁴⁸ National Fuel asserts Well SC-468 was the only Beech Hill production well to produce gas after 1947.

⁴⁹ National Fuel states the well was shut in in 2011.

little additional data to support its position that the entire 5,123.06-acre expansion is required by the public convenience and necessity to improve the operation or to maintain the integrity of Beech Hill. Thus, our authorization in this order is limited to the expansion of the Beech Hill buffer zone to include the Shongo pool, as depicted on Attachment 1. We require National Fuel to provide the acreage of the buffer expansion authorized.

vii. Area 7

63. National Fuel seeks to further expand the Beech Hill reservoir boundary by 1,061.78 acres and the buffer boundary by 711.54 acres in Area 7, which lies south and adjacent to Area 6. National Fuel states that Area 7, as defined by 2D seismic data, is similar to the structural setting of the pool in which Well 7451 is located in Area 6. National Fuel asserts that, given the structural similarities and the proximity to Well 7451, Area 7 “could” contain storage gas.⁵⁰

64. Without additional information regarding Area 7, from which no gas of any origin is documented, we find that National Fuel has not demonstrated that authorization of expansion for Area 7 is warranted to improve or maintain the integrity of the storage field. Thus, National Fuel’s request to expand the Beech Hill storage reservoir and buffer zone in Area 7 is denied.

b. Use of Well 7451 as a Withdrawal-Only Well

65. National Fuel seeks authorization to use Well 7451 as a withdrawal-only well to recover migrated storage gas by direct withdrawal from the structure in which it is located. We deny this request based upon the following discussion.

66. National Fuel states that Well SC-468 is the only production well in the Beech Hill field that produced gas after the majority of the original production wells ceased production in the 1940s.⁵¹ National Fuel further states that it believes the post-1940s production was related to the migration of gas into Beech Hill from the Shongo pool. National Fuel asserts that it has identified a geological pathway that enables gas migration between the pools. We do not dispute National Fuel’s interpretation of the gas migration mechanism.

⁵⁰ No wells have been drilled in Area 7 to confirm or deny gas presence of any origin.

⁵¹ Data provided indicates that production from Well SC-468 lasted over 30 years.

67. National Fuel compared wellhead pressure data of the Beech Hill Indicator Well⁵² to that of Well 7451 from 2008 until 2014. The data revealed that when Well 7451 is not in a withdrawal state, the hydraulic connection between the two pools is weak. We believe that the active production or withdrawal state of Well 7451 caused storage gas to migrate through a geologic pathway to Well 7451.

68. National Fuel has not demonstrated that additional migration/production of storage gas from the Beech Hill Storage Field would cease if Well 7451 were to be authorized as a withdrawal-only well.

69. The Commission is concerned by National Fuel's continued inability to manage its storage gas migration issues, beginning in 2002 when we authorized the Beech Hill Annex expansion. The 2006 Order, which authorized the conversion of two observation wells into withdrawal wells, attempted to address gas migration into the Beech Hill Annex by requiring National Fuel to file, within two storage seasons after the withdrawal wells were placed into service, an application to amend its certificated storage boundaries and propose buffer boundaries for both the Beech Hill and Beech Hill Annex, and to propose observation wells within the buffer zone and a plan to prevent further gas migration from the field.

70. National Fuel never converted the two observation wells to withdrawal wells due to deliverability issues. As a result, National Fuel did not file an application proposing new observation wells or a plan to prevent storage gas migration from the field. In 2012, National Fuel informed the Commission of the migration issues associated with Well 7451 and was authorized to withdraw gas from the well during the 2012-2013 withdrawal season, treat the output as storage withdrawal, and provide service to its customers.

71. We believe that the limited reservoir and buffer boundary expansions authorized by this order, as depicted on Attachment 1, provide National Fuel the needed acreage to contain the storage gas migration that has been documented to date. Consistent with Commission precedent, we will not indefinitely continue to authorize further expansions of the Beech Hill Complex to areas where storage gas has migrated. We believe that it is incumbent upon National Fuel to effectively manage its storage fields in a manner that prevents migration of storage gas beyond certificated boundaries.⁵³

⁵² National Fuel identifies the Indicator Well for the Beech Hill field as being located approximately 1,000 feet northeast of Well SC-468.

⁵³ See, e.g., *Northern Natural Gas Company*, 131 FERC ¶ 61,209, at P 86 (2010).

72. Accordingly, National Fuel must file, within six months from the date of this order, a comprehensive and specific storage gas containment and management plan, detailing how it will effectively mitigate any migration of storage gas from the Beech Hill Field to the Shongo pool. The plan should further address how National Fuel will assess and mitigate gas migration from all other areas in the Beech Hill Complex. The plan should be designed to go into effect within one year from the date of this order.

V. Environmental

73. The Commission reviewed National Fuel's proposal and determined that the project will not affect the environment, and thus, no National Environmental Policy Act analysis was conducted.

74. The Commission, on its own motion, received and made a part of the record in this proceeding all evidence, including the application and exhibits thereto, as supplemented, and all comments submitted herein, and upon consideration of the record,

The Commission orders:

(A) A certificate of public convenience and necessity is issued to National Fuel authorizing the expansion of the National Fuel's Beech Hill, Beech Hill Annex, West Independence, and East Independence certificated reservoir and buffer boundaries, as modified in Attachment 1, to include the Oriskany Sandstone reservoir, the Onondaga Limestone cap rock, and the Helderberg Limestone base rock in Allegany and Steuben Counties, New York, as described in the body of this order.

(B) The certificate issued in Ordering Paragraph (A) is conditioned on National Fuel complying with all regulations under the NGA including, but not limited to, paragraphs (a), (c), (e) and (f) of section 157.20 of the Commission's regulations.

(C) National Fuel is required to file revised Tables 1 and 2 that reflect the reservoir and buffer zones authorized in this order, as depicted on Attachment 1.

(D) National Fuel is required to file, within six months from the issuance date of this order, a comprehensive and specific storage gas containment and management plan detailing how it will effectively mitigate any flow of storage gas from the Beech Hill Field to the Shongo pool, as well as additional assessment and mitigation efforts designed to prevent the flow of any storage gas from the Beech Hill Storage Complex in general. The plan may also include details of how National Fuel intends to recover storage gas from Shongo pool, without inducing further migration from the Beech Hill Field. The plan should be designed to go into effect within one year of the date of this order.

National Fuel is further required to file quarterly reports on all actions taken, and an assessment of the results of those actions, on halting the migration of gas. The reports should also include, at a minimum, the volume of gas injected during the period, volume withdrawn, pressure in the storage field, and pressure in the expanded buffer zone.

(E) National Fuel's request for a predetermination that it may roll the costs associated with the project, as authorized herein, into its system rates in a future NGA section 4 rate proceeding is granted, absent a significant change in circumstances.

(F) National Fuel is required to keep separate, detailed records of all costs associated with expanding the Beech Hill Complex, as authorized in this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.

Appendix A

- Atlanta Gas Light Company and Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas
- Consolidated Edison Company of New York, Inc.
- Atmos Energy Marketing LLC
- New York State Department of Environmental Conservation
- National Grid Gas Delivery Companies
- Donald and M'Lissa Sugden
- E. F. Dean, Inc.
- Dortha Caylor
- Mark Elder
- Storage Field Landowners Association.

