

128 FERC ¶ 61,050  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Jon Wellinghoff, Chairman;  
Sudeen G. Kelly, Marc Spitzer,  
and Philip D. Moeller.

Columbia Gas Transmission Corporation

Docket No. CP08-78-000

ORDER ISSUING CERTIFICATE

(Issued July 15, 2009)

1. On February 25, 2008, Columbia Gas Transmission Corporation (Columbia) filed an application under section 7(c) of the Natural Gas Act (NGA) for a certificate of public convenience and necessity authorizing it to extend the storage reservoir and protective boundaries of its Weaver storage field located in Ashland, Knox, and Richland Counties, Ohio.<sup>1</sup> Columbia states that the extension of the Weaver storage field's boundaries is necessary to protect the integrity of the storage field in light of the evidence that storage gas is migrating to third-party production wells beyond the boundary of the storage field. As discussed below, the Commission will grant the requested authorizations, subject to the conditions stated herein.

**I. Background and Proposal**

2. Columbia is a natural gas company engaged primarily in the business of transporting natural gas and operating underground storage fields in interstate

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<sup>1</sup> Columbia's proposal to extend the storage field boundaries affects only a portion of the storage field in Richland County. On February 26, 2009, Columbia supplemented its application with additional information.

commerce.<sup>2</sup> Columbia, a Delaware corporation, is a wholly owned subsidiary of Columbia Energy Group, which, in turn, is a wholly owned subsidiary of NiSource, Inc.

3. Columbia commenced storage operations at the Weaver storage field in 1937 and received initial certificate authority in 1946.<sup>3</sup> The current certificated boundaries of the field were approved by the Commission in 1986.<sup>4</sup> The Weaver storage field has a maximum certificated storage capacity of approximately 50.5 Bcf, including a working gas capacity of 18.97 Bcf, a current certificated wellhead shut-in pressure of 1,150 psig, and a maximum deliverability of approximately 246.1 million cubic feet per day (MMcf per day) at 14.73 psia.

4. Columbia requests authorization to extend the western boundaries of its Weaver storage field to encompass a total of approximately 3,056 additional acres.<sup>5</sup> Specifically, Columbia proposes to extend the existing boundary of its storage reservoir and the protective boundary of its storage field. With respect to the latter, Columbia requests authorization for a one-mile buffer zone extending from the new storage reservoir boundary. Columbia states that two separate, but related, factors underlie its request to extend the current boundaries of the Weaver storage field, both of which indicate that storage gas from the Weaver storage field is being produced by three natural gas wells

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<sup>2</sup>Columbia owns and operates natural gas storage and transportation facilities in Delaware, Kentucky, Maryland, New Jersey, New York, North Carolina, Ohio Pennsylvania, Tennessee, Virginia, and West Virginia.

<sup>3</sup> See *The Ohio Fuel Gas Co.*, 5 FPC 504 (1946). Additional certificate authorizations were granted for the Weaver storage field in *The Ohio Fuel Gas Co.*, 6 FPC 1111 (1947); *The Ohio Fuel Gas Co.*, 8 FPC 1155 (1949); *The Ohio Fuel Gas Co.*, 12 FPC 828 (1953); *Columbia Gas Transmission Corp.*, 45 FPC 398 (1971); *Columbia Gas Transmission Corp.*, 35 FERC ¶ 61,345 (1986); *Columbia Gas Transmission Corp.*, 68 FERC ¶ 62,001 (1994); *Columbia Gas Transmission Corp.*, 79 FERC ¶ 61,160 (1997); and *Columbia Gas Transmission Corp.*, 113 FERC ¶ 62,013 (2005).

<sup>4</sup> *Columbia Gas Transmission Corp.*, 35 FERC ¶ 61,345 (1986).

<sup>5</sup> Columbia does not propose any changes to the current certificated capacity of the storage facility.

adjacent to the storage field's current protective boundary that are owned and operated by Interden Industries, Inc. (Interden), an Ohio independent natural gas producer.<sup>6</sup>

5. First, Columbia states that it has noted a significant change in the chemical composition of gas samples obtained from the three producing wells.<sup>7</sup> Columbia asserts that based on the analysis of these gas samples, the gas being produced by the three Van Wade wells closely matches the compositional structure of Columbia's pipeline and storage gas.<sup>8</sup> Columbia also states that the completion reports for the three wells indicate that the wells' producing zone is the Clinton sandstone formation, which is the storage formation for the Weaver storage field.<sup>9</sup>

6. Second, Columbia states that two geologic maps – a structural and isopach map – indicate that the Clinton sand formation extends beyond the western confines of the Weaver storage field's protective boundary.<sup>10</sup> Columbia maintains that Interden's wells are located in the Clinton sandstone at a geographic elevation higher than the storage field, and that such a structural location is ideal for the production of storage gas migrating through the reservoir. Columbia further states that a stratigraphic cross-section clearly shows a westward expansion of the Clinton sand formation from Columbia Storage Well 10929 into the subject Van Wade wells.

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<sup>6</sup> The subject wells are the Van Wade #3, Van Wade #5, and Van Wade #6 wells, which were drilled by Interden in 1999. Interden has been drilling for and producing natural gas in Richland County, Ohio since 1987. It currently operates 11 natural gas wells and owns or controls undeveloped lease acreage near the Weaver storage field.

<sup>7</sup> By agreement with Interden, Columbia obtained gas samples from Interden's production wells.

<sup>8</sup> Columbia includes a comparison of the gas sample results, bar graphs illustrating changes over time in the key constituents of the gas, and a narrative description of the gas sample analysis in Exhibit Z-1 of its application.

<sup>9</sup> Columbia includes completion reports and logs of the three Interden wells, as well as Columbia's Storage Well 10929 in Exhibit Z-3 of its application.

<sup>10</sup> Columbia includes the structural and isopach maps in Exhibit Z-2 of its application.

7. Columbia states that it was unaware of Interden's gas exploration activities until Interden was issued a permit by the state. Columbia asserts that it then contacted the producer to discuss its concerns about the proximity of the wells to the Weaver storage field. Columbia reports that it was initially successful in obtaining periodic gas samples from the Interden wells to monitor whether gas from its storage field was also being produced from the wells, but more recent discussions with Interden have been unproductive. Columbia states that it will be initiating legal proceedings to force Interden to stop producing gas from the Van Wade wells, and anticipates exercising its right of eminent domain, where necessary, to acquire underground gas storage easements if its application is approved.

## **II. Notice, Interventions, and Protests**

8. Public notice of Columbia's application was published in the *Federal Register* on March 11, 2008.<sup>11</sup> Timely, unopposed motions to intervene were filed by Interden; Van Ross Wade (Van Wade);<sup>12</sup> Orange and Rockland Utilities, Inc.; David E. and Susan B. Boals (the Boals); and James and Sharon Rathburn (the Rathburns). Timely, unopposed motions to intervene are granted by operation of Rule 214 of the Commission's Rules of Practice and Procedure.<sup>13</sup>

9. Frank Beach and Janet Dearth (Mr. Beach and Ms. Dearth); James and Roma Gatton (the Gattons); Charles R. and Ava J. Crawford (the Crawfords); Steve and Margaret Wade (the Wades); Glenn Pore (Mr. Pore); Delbert Mellot as Trustee for the Mellot Family Trust (Mr. Mellot); and Tom A. Kemp (Mr. Kemp) filed untimely motions to intervene. These motions show that the late intervenors have a direct and substantial interest in this proceeding, and that granting the motions will not delay the proceeding or cause undue prejudice to the other parties. For good cause shown, the motions will be granted.<sup>14</sup>

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<sup>11</sup> 73 Fed. Reg. 12,972.

<sup>12</sup> Many of Van Wade's subsequent comments were made in his capacity as president of a newly formed citizens group, Ohioans Protecting Our Resources and Rights, LLC or under that group's designation.

<sup>13</sup> 18 C.F.R. § 385.214(c) (2008).

<sup>14</sup> See 18 C.F.R. § 385.214(d) (2008).

10. All of the intervenors, except Orange and Rockland, filed either protests or comments voicing strong opposition to Columbia's proposal, either separately or together with their motions to intervene. In addition, the following individuals also filed comments or protests opposing Columbia's application: Fredric W. Ackerman (Mr. Ackerman); Leslie and Rita Craft (the Crafts); Dana L. Goldman (Ms. Goldman); Ronald L. Pugh (Mr. Pugh); Robin L. Roberts; Robert and Patricia Gatton; the Remy family; and jointly, Jerry W. Smith, Susan A. Smith, and Mindy L. Caudill (the Smiths and Ms. Caudill). The Trustees of Jefferson Township (Jefferson Township Trustees) and the Trustees of Worthington Township (Worthington Township Trustees) filed protests in the form of resolutions opposing the application. Resolutions were also filed by Butler, Ohio, the Ohio Village Council and the Bellville, Ohio Village Council supporting the efforts of Ohioans Protecting Our Resources and Rights, LLC (OPORR) in challenging the storage field expansion. The Commission also received letters from U.S. Senator George V. Voinovich, forwarding a protest letter he received from Mr. Beach and Ms. Dearth, and U.S. Congressman Jim Jordan.

11. Virtually all of the intervenors and protestors are landowners on whose property Interden operates natural gas production wells. These landowners own the mineral rights to the natural gas and receive royalty payments from Interden, as well as discounted natural gas from Interden. The Van Wade wells that are involved in this proceeding, and numerous other gas producing wells, are located on Van Wade's property, which is encumbered by oil and gas leases.<sup>15</sup> Van Wade states that he operates on his property a large commercial and residential nursery business serving six states and relies on the use of gas from Interden to run his business. The landowners contend that Columbia is unfairly taking their valuable property and mineral rights, they will lose the inexpensive source of natural gas needed to heat their homes and dry their grain, property resale values will suffer, and Columbia's proposal will have far-reaching adverse economic effects on the affected communities.

12. With respect to Columbia's proposal to expand the storage field boundary, Interden, Van Wade, and the landowners dispute Columbia's claim that storage gas has migrated outside of the current storage field boundary and buffer zone, contend that the evidence does not prove that Columbia's storage gas is being produced by Interden, object to the size of the proposed buffer zone, assert that Columbia has not adequately explored or justified its rejection of alternatives to expanding the storage field

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<sup>15</sup> Van Wade's property is adjacent to the western boundary of the Weaver storage field.

boundaries, and allege that Columbia's project is a part of an undisclosed plan for a Weaver storage facility expansion associated with the Ohio Storage Project in Docket No. CP08-431-000<sup>16</sup> that requires environmental review. The intervenors also seek independent testing of the gas samples, copies of the maps of the Weaver storage field reservoir that were filed as confidential, and a full opportunity in a hearing to respond to Columbia's proposed extension of the storage field boundaries.

13. In response, Columbia filed an answer to the protests,<sup>17</sup> maintaining that the information it filed in Exhibit Z-1 fully supports the need to take immediate steps to protect the natural gas it stores and concluding that the extension of the existing boundaries of the Weaver storage field is required. Columbia emphasizes that its only interest in this case is to stop the Van Wade wells from producing storage gas from the Clinton formation, and is not to acquire Interden's production assets or prevent production from other storage formations.

### **III. Preliminary Matters**

#### **A. Landowner Notification**

14. A number of landowners allege that Columbia failed to comply with the landowner notification requirements in section 157.6(d) of the Commission's Rules and Regulations.<sup>18</sup> Some landowners maintain that they received notice of Columbia's proposed application past the time required by the regulations, or were not given enough notice to meet the intervention deadline or meaningfully protest the application.<sup>19</sup> Other

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<sup>16</sup> The Commission issued a certificate authorizing the Ohio Storage Project on March 19, 2009. *Columbia Gas Transmission Corp.*, 126 FERC ¶ 61,237 (2009).

<sup>17</sup> Columbia also filed an answer on February 10, 2009 to the November 14, 2008 comments of Interden and the December 1, 2008 comments of Mr. Beach. Although the Commission's Rules of Practice and Procedure do not permit answers to protests, the Commission finds good cause to waive Rule 213(a) to admit Columbia'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) (2008).

<sup>18</sup> 18 C.F.R. § 157.6(d) (2008).

<sup>19</sup> *E.g.*, Ms. Goldman, the Crawfords, the Crafts, the Rathburns, Mr. Mellot, the Jefferson Township Trustees, and the Worthington Township Trustees. Only Mr. Mellot maintains he received notice after the intervention deadline.

landowners assert that they never received notification of Columbia's proposed storage field boundary extension.<sup>20</sup> The landowners contend that, as a result, they have been denied due process. The landowners also allege bad faith on the part of Columbia in purportedly delaying landowner notification of the project to shorten landowners' response time, intimidating the press into refraining from reporting on the specifics of the proposed project, and using a flood plain map in its landowner notices to mislead landowners about the location of the project.

15. Section 157.6(d)(1) of the regulations requires that an applicant "make a good faith effort to notify all affected landowners and towns, communities, and local, state and federal governments and agencies involved in the project" of the proposal:

- (i) By certified or first class mail sent within 3 business days following the date the Commission issues a notice of the application; or
- (ii) By hand, within the same time frame; and
- (iii) By publishing notice twice of the filing of the application, no later than 14 days after the date that a docket number is assigned to the application, in a daily or weekly newspaper of general circulation in each county in which the project is located.<sup>21</sup>

16. The Commission issued its Notice of Application on March 4, 2008, providing for interventions and protests to be filed by March 25, 2008. Therefore, Columbia was required to mail notice to the affected parties by March 7, 2008. It appears that the parties assert Columbia did not comply with the regulations largely because they mistakenly believe Columbia was required to mail landowner notices within three days of Columbia's filing of its application on February 25, 2008, instead of within three days of the Commission's notice of Columbia's application.<sup>22</sup> Columbia complied with the

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<sup>20</sup> Mr. Beach and Ms. Dearth, Mr. Pore, the Wades, the Jefferson Township Trustees, and the Village of Bellville, Ohio.

<sup>21</sup> 18 C.F.R. § 157.6(d)(1) (2008).

<sup>22</sup> Ms. Goldman and the Crawfords are mistaken that the 60-day notice period for certain Part 157, subpart F blanket certificate activities applies in this case. This proceeding was not filed under Columbia's blanket certificate program, which allows a Part 157, subpart F blanket certificate holder to undertake a restricted array of routine activities without the need to obtain a case-specific certificate for each individual project.

requirement in section 157.6(d)(1)(i) by mailing approximately 535 landowner letters on March 6, 2008, two days after the Commission's notice. Columbia reports that after approximately 10 percent of the letters were returned, it updated ownership and address information and made a second landowner mailing on March 21 and 24, 2008 to the affected landowners whose letters were returned.<sup>23</sup>

17. Columbia also complied with its obligation to publish notice of the application twice in a newspaper in each county in which the project is located. While the Weaver storage field spans several Ohio counties, the proposed expansion area is located only in Richland County, Ohio. Columbia published notification in *The Bellville Star* and the *Mansfield News Journal*, newspapers in Richland County, on March 6, and March 9, 2008, respectively. Columbia states that it needed to publish the notice in two separate newspapers on two separate dates, since *The Bellville Star* is published only once a week and has early deadlines, which would have prevented the second publication from appearing in the paper within the required 14-day period. Under these circumstances, the Commission finds that Columbia's newspaper publication sufficiently complies with the regulations.

18. In addition, between March 3, and March 13, 2008, Columbia provided copies of the public version of its application to the main Richland County Public Library in Mansfield, the Butler branch of the county library, and the Bellville Public Library for public review.

19. Further, Columbia notified the following towns, communities and government entities and agencies of its project: State of Ohio, Department of Transportation; Richland County Park Board; Village of Butler; Richland County Public Library; Board of Education; State of Ohio. Columbia also made informal contact with various government offices, such as the area U.S. Congressional Office, the Richland County Commissioner, the Butler and Bellville mayors, and the Jefferson Township Trustees.

20. Finally, Columbia mailed additional materials to more than 500 landowners in October 2008 in an effort to further aid their understanding of the project. Included in these materials were a "Weaver Storage Field Boundary Extension Information Sheet," and a project website address and toll-free number to call to obtain additional information about the project.

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<sup>23</sup> Columbia filed its updated landowner list with the Commission on March 25, 2008.

21. The Commission finds that Columbia has complied with its obligation under the landowner notification requirements of section 157.6(d)(1) to “make a good faith effort to notify all affected landowners and towns, communities, and local, state and federal governments and agencies involved in the project” of the proposal. While some landowners (those receiving Columbia’s second mailing) may have received their notification of the project late – either immediately before, on, or after the March 25, 2008 intervention date – those landowners were able to file late motions to intervene, or subsequent comments or protests. The Commission has granted all late interventions of parties with a direct and substantial interest in the proceeding, and has accepted, considered, and made part of the record all comments and protests. Therefore, none of the landowners receiving delayed notice have been denied due process from a failure to receive timely notice.

22. With respect to the landowners who assert they received no notice of the project, Columbia states that Mr. Glen Pore, the Wades (Steve and Margaret), and Mr. Beach and Ms. Dearth were not identified in the land records it utilized as landowners located within the boundaries of Columbia’s proposed storage field boundary extension.<sup>24</sup> Columbia states that it began its search in the Richland County Tax Map Office, but officials in that office informed Columbia that the Richland County Regional Planning Commission (RPP) had the most comprehensive computer generated maps and property ownership information available. Thus, Columbia states it worked with an RPP official to develop the landowner list.

23. From staff’s review of the maps and information filed in this proceeding and that are publicly available, the Commission concludes that Mr. Pore and the Wades are not affected by Columbia’s proposed project, but that Mr. Beach’s and Ms. Dearth’s property is, in fact, within the boundary of proposed project.<sup>25</sup> If so, they should have received written notice of the project from Columbia. Nevertheless, despite the lack of formal notice, Mr. Beach filed a motion for late intervention in the proceeding on April 2, 2008 (only eight days after interventions were due) which the Commission is granting, as discussed above. Further, Mr. Beach and Ms. Dearth have been active participants in the case, filing numerous comments and protests, all of which have been accepted and considered by the Commission. For these reasons, the Commission does not believe that

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<sup>24</sup> Columbia’s November 20, 2008 response to Data Request No. 1.

<sup>25</sup> Mr. Beach and Ms. Dearth assert that they are listed in the Richland County Tax Auditor’s records. *See* September 1, 2008 comment letter of Frank Beach and Janet Dearth at 2.

Mr. Beach and Ms. Dearth have been adversely affected by the failure to receive formal notice of the project. The Commission also believes that Columbia attempted in good faith to obtain a complete list of landowners located within the boundary of the project, having initially gone to the Richland County Tax Map Office, and upon the advice of the tax office, used the RPP's records instead.

24. With respect to the towns and government entities who assert they received no notice of the project, Columbia's November 20, 2008 data response indicates that it did not mail written notice to the Jefferson Township Trustees or the Village of Bellville. However, the Commission notes that in his August 29, 2008 protest letter, Van Wade states that he represents the concerns of the Villages of Bellville and Butler, Ohio, and the Worthington and Jefferson Township Trustees.<sup>26</sup> His assertions were not contradicted by these entities. Also, while the Village of Bellville did not receive formal notice of the project, the Jefferson Township Trustees and the Village of Bellville filed protests in the form of resolutions against the proposals. Further, in regard to the Village of Bellville, Columbia published notice in *The Bellville Star*, provided a copy of its application to the Bellville Public Library, and informally contacted the Mayor of Bellville.<sup>27</sup> Thus, the record demonstrates that the Jefferson Township Trustees and the Village of Bellville knew about Columbia's proposals and participated in the proceedings. These parties cannot now claim that the lack of formal notice deprived them of their opportunity to participate. For these reasons, the Commission concludes that the intent of the notice regulations has been fulfilled. Finally, Columbia states that there was no need to notify certain federal, state, and local agencies normally notified in connection with environmental compliance, since no ground-disturbing construction activities are associated with the project.

25. The Commission finds no evidence of bad faith on the part of Columbia in its provision of notice of the project. As explained above, Columbia did not delay notification to shorten response times, but provided notice in the manner specified in the Commission's regulations. Further, while the general location map Columbia provided in the landowner notices is somewhat unclear, since the project boundary is not delineated and the shaded flood plain potentially could be mistaken for the project area, nothing has been presented that indicates the map was intended to mislead and confuse landowners.

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<sup>26</sup> We note that Mr. Ackerman, who has been active in the proceeding since April 8, 2008, is a member of the Board of Jefferson Township Trustees.

<sup>27</sup> See Columbia's November 20, 2008 response to Data Request No. 2.

**B. Access to Information Filed as Privileged**

26. In Exhibit Z of its application, Columbia filed two surface boundary maps of the Weaver storage field, one reflecting the existing and proposed reservoir and protective boundaries on the western portion of the field, and the other reflecting the entire Weaver storage field with the revised boundaries.<sup>28</sup> Columbia also filed the subsurface geotechnical and structural maps of the storage field in Exhibit Z-2 of its application. Columbia filed all of the above maps as privileged information to be kept confidential to protect the commercially sensitive information therein and to maintain the long-term viability and integrity of the storage reservoirs. In addition, Columbia filed with the Commission an updated landowner list on March 25, 2008, also as privileged information.

27. Interden, Van Wade, and various landowners sought copies of these maps and the landowner list, which Columbia refused to provide. In their protests, Interden and Van Wade request that the Commission require Columbia to release the confidential maps and landowner list. Interden contends that by refusing to provide the relevant maps of the storage field reservoir and protective boundaries at issue, Columbia is effectively preventing Interden and other affected parties from fully assessing and responding to the application and denying them a fair opportunity to be heard.<sup>29</sup> Interden asserts that such an opportunity is critical to parties who own significant interests in the area and are concerned about the breadth of Columbia's proposal. Interden maintains that without the maps, it cannot assess and challenge the support Columbia provided to justify its proposed buffer zone in Columbia's May 23, 2008 data response.<sup>30</sup>

28. Similarly, Van Wade contends that without access to the boundary and geologic maps, he cannot fully determine the project's impact on his property and business interests.<sup>31</sup> Van Wade also maintains that without the storage field maps, he cannot determine the location of the Columbia storage well from which Columbia took its gas

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<sup>28</sup> Columbia filed an enhanced version of Exhibit Z, Sheet 1 in its May 23, 2008 data response and in its June 4, 2008 supplement to its February 25, 2008 application.

<sup>29</sup> Interden's March 25, 2008 protest at 5.

<sup>30</sup> Interden's May 30, 2008 comments at 3.

<sup>31</sup> Van Wade's March 25, 2008 protest.

sample.<sup>32</sup> Further, Van Wade asserts for himself and in his capacity as president of the citizens group OPORR that without access to the landowner list, they cannot accurately assess the economic impact on their communities and cannot fulfill the Commission's request in its June 12, 2008 data request that OPORR provide detailed information on such economic impact.<sup>33</sup>

29. Columbia states that it opposes supplying full structural maps of its field because they contain commercially sensitive information and are critical to the operation of the storage field. Columbia maintains that the maps reflect proprietary research and technical data developed over many years at considerable expense. Further, Columbia contends that Interden had an opportunity to review the maps in meetings with Columbia officials. Moreover, Columbia asserts that while neither Interden nor Van Wade have justified why they should have access to commercially sensitive comprehensive storage field mapping information, Columbia is willing to provide to Interden that portion of the Weaver storage field map depicting the specific area where Columbia proposes to extend the existing boundaries.<sup>34</sup>

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<sup>32</sup>*Id.* Van Wade and OPORR assert that they need the specific location from where the Weaver storage field gas sample was taken so that new samples can be taken from the same location and independently analyzed. *See* OPORR's July 11, 2008 response, Question 1c. As discussed, *infra*, new samples from the same well where the original Weaver storage field sample was obtained were taken jointly by Columbia and Interden in December 2008, and independently analyzed.

<sup>33</sup> OPORR's July 11, 2008 response, Question 2.

<sup>34</sup> In July 2008, Van Wade and OPORR filed jointly, and Interden separately, Freedom of Information Act (FOIA) requests in FOIA No. FY08-76 and FOIA No. FY08-75, respectively, seeking the privileged maps and landowner list. The acting director of the Commission's Office of External Affairs denied the parties' requests that the maps be released, finding that the documents are exempt from mandatory disclosure pursuant to FOIA Exemption 4, which protects from disclosure "trade secrets and commercial or financial information obtained from a person and privileged or confidential." 5 U.S.C. § 552(b)(4) (2006). The acting director also denied, in part, the FOIA requests for the release of the updated landowner list. The acting director refused to release the names, personal addresses, and other identifying data of private citizens because FOIA Exemption 6 provides that an agency should not disclose "personnel . . . and similar files the disclosure of which would constitute a clearly unwarranted invasion of privacy." 5 U.S.C. § 552(b)(6) (2006). However, on September 11, 2008, the acting

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30. OPORR and its member landowners do not need to view the storage field maps to know how their property is affected by the project for purposes of the issues in this proceeding. This is not a case involving the construction of facilities, where landowners might be concerned how close a pipeline, compressor, or storage well pad will be to their homes because of potential environmental impacts, such as noise or visual impacts. Here, Columbia proposes no new storage wells, no pipeline trenches or other ground-disturbing activities, and the project will not affect, or interfere with, the landowners' use of the surface of their properties. The notice the landowners received from Columbia explained that Columbia was proposing to extend and realign a portion of the Commission-recognized boundaries of its Weaver storage field, which holds natural gas in rock formations about a half-mile below the surface. The notice made clear that "no construction, abandonment, or soil disturbance" was proposed, and that Columbia would need a storage lease, easement, and/or other land rights from the landowner. Access to the confidential storage field maps was not relevant or necessary for a landowner to ascertain the extent to which the project would affect the landowner's property for it is fair to assume that if a landowner received notice of the project, presumably Columbia requires the below-ground rights of all of that landowner's property.<sup>35</sup> Nor is there a need for Van Wade and OPORR to know the identity or location of other landowners who are affected by the project, since the impact of the project is primarily an individual economic impact on each landowner.

31. The only relevance of knowing the size and location of the storage field, or the identity of other landowners affected by the project, would be to estimate the extent of the economic interests at stake as a result of the project. Thus, OPORR and the landowners seek access to the maps and the landowner list to help in their assessment of the extent of the economic interests at stake. However, the degree of economic impact on individual landowners is relevant only to the amount Columbia should be required to compensate affected landowners, which will be considered and resolved in eminent domain proceedings before a state or federal court and not in this proceeding.<sup>36</sup>

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director did release, through a redacted version of the landowner list, the names, addresses, and other data of the commercial entities on the landowner list.

<sup>35</sup> In any event, the underground area of a landowner's property in which Columbia will require an interest will be known to the landowner once Columbia approaches each landowner to negotiate the easements.

<sup>36</sup> Since each individual affected property owner will be compensated for the value of any property interest needed by Columbia for the boundary expansion, assertions that

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32. For these reasons, the Commission finds that OPORR and Interden have not demonstrated a sufficient need for the privileged information that would outweigh the harm to Columbia or private individuals from its release. Columbia's storage field maps contain commercially sensitive material that must be protected and, therefore, should remain confidential, since these maps could provide technical information regarding the composition and location of the gas Columbia holds in storage.<sup>37</sup> With respect to the landowner list, the names and addresses of private citizens implicate a privacy interest, and their mandatory release would constitute an unwarranted invasion of individual privacy.<sup>38</sup> Thus, the Commission denies Interden's and OPORR's requests to require Columbia to make public the surface and subsurface maps of the Weaver storage field and the updated landowner list.

33. While the Commission will not require Columbia to publicly release the maps and the list of private landowners affected by the project, we note that Columbia shared some of the confidential maps with Interden and Van Wade.<sup>39</sup> Specifically, on January 18, 2007, Columbia met with Interden and Van Wade and his family at the Wade property to take gas samples and discussed Columbia's storage operation, the storage boundaries, the history of the Weaver field, and previous gas sampling and results.<sup>40</sup> Although Columbia

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there will be negative impacts on the community in general are entirely speculative. To the extent landowners have been receiving inexpensive gas, in addition to royalties, as a consequence of the "production" of Columbia's storage gas that has migrated to their properties, that is not an interest to which the Commission can give weight in balancing public interest considerations.

<sup>37</sup> Indeed, the circumstances of this case itself, as discussed in further detail below, where a producer developed production wells too close to the boundary of a storage field, resulting in storage gas migrating to production wells, demonstrate the sensitivity of the maps.

<sup>38</sup> Individual affected landowners should decide for themselves whether to identify themselves to and work with other affected landowners, as many have in this proceeding and in other proceedings.

<sup>39</sup> We also note that section 388.107(h) of our regulations provides that "geological and geophysical information and data, including maps, concerning wells" are exempt from public disclosure. 18 C.F.R. § 388.107(h) (2008).

<sup>40</sup> Columbia's April 4, 2008 Answer at 6.

refused to give Interden a copy of the entire map of the field, Columbia showed the complete map of the Weaver storage field to Interden during its February 1, 2007 meeting with Interden.<sup>41</sup> Further, as noted above, Columbia offered to provide Interden with the portion of the storage field map relating to the part of the Weaver storage field where Columbia proposes to extend the boundary,<sup>42</sup> and Interden indicated that it and Columbia were engaged in ongoing discussions regarding that offer.<sup>43</sup> In addition, Columbia offered to provide the privileged maps to OPORR if it signed a non-disclosure agreement, but OPORR did not consent to a non-disclosure provision.<sup>44</sup> More importantly, the Commission has thoroughly reviewed the maps provided by Columbia, and has relied on the information in making its decision with respect to whether expansion of the storage field boundaries is justified and whether the proposed new boundaries are reasonable.

### **C. Requests for Evidentiary Hearing and Additional Information**

34. Van Wade requests that the Commission initiate a full evidentiary hearing to address issues related to expanding the certificated boundaries of Columbia's storage facility.<sup>45</sup> Van Wade, as president of OPORR, also requests that the Commission convene public meetings to explain how the community will be affected today and in the future, both economically and environmentally.<sup>46</sup>

35. Section 7 of the NGA provides for a hearing when an applicant seeks a certificate of public convenience and necessity, but does not require that all such hearings be formal

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<sup>41</sup> *Id.* at 6 and 9.

<sup>42</sup> *Id.* at 10.

<sup>43</sup> *See* Interden's May 30, 2008 Comments on Columbia's May 23, 2008 response at 2, n.1.

<sup>44</sup> *See* OPORR's August 29, 2008 comment letter at 1.

<sup>45</sup> Van Wade's March 25, 2008 Motion to Intervene and Protest at 5.

<sup>46</sup> *See* OPORR's August 29, 2008 comment letter at 4. Also, on November 12, 2008, Linda Wade, secretary of OPORR, requested that Columbia schedule a series of public meetings regarding its proposal, and filed with the Commission a copy of its e-mail to Columbia containing the request.

trial-like hearings. An evidentiary trial-type hearing is necessary only where material issues of fact are in dispute that cannot be resolved on the basis of the written record.<sup>47</sup> As discussed below, the written record provides a sufficient basis upon which to resolve the factual issues presented in this case. Consequently, the Commission finds no need for a full evidentiary hearing.

36. The Commission also denies Van Wade's and OPORR's request for public meetings. At this juncture, the Commission finds that such informational public hearings are unnecessary. The combination of Columbia's October 2008 supplemental mailing of additional information on the project, the website Columbia created to provide additional project information, and the availability of a toll-free phone number where landowners can have specific questions answered by a Columbia representative provides extensive public information about the project. Public hearings would not add measurably to the landowners' understanding of Columbia's proposal.

37. On November 10, 2008, Mr. Beach requested that the Commission answer a series of 23 general questions apparently designed to enable him to determine whether the Commission's internal review processes are adequate to effectively evaluate and weigh the public interest and to set policy.<sup>48</sup> The Commission declines to answer Mr. Beach's inquiries. They are questions of a general nature and, as Mr. Beach admits in his e-mail response to the denial of his FOIA request, the answers to the questions "have no bearing on the outcome of CP08-78."<sup>49</sup> Mr. Beach's inquiry seeks information that is outside the scope of this proceeding and irrelevant to the resolution of the issues in this case.

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<sup>47</sup> See, e.g., *Southern Union Gas Co. v. FERC*, 840 F.2d 964, 970 (D.C. Cir. 1988); *Cerro Wire & Cable Co. v. FERC*, 677 F.2d 124 (D.C. Cir. 1982); and *Citizens for Allegan County, Inc. v. FPC*, 414 F.2d 1125, 1128 (D.C. Cir. 1969).

<sup>48</sup> Mr. Beach's filed his pleading on November 9, 2008 as a FOIA request, which the Commission's FOIA Public Liaison in the Office of External Affairs denied because it did not seek access to existing documents. The public liaison's denial suggested that Mr. Beach's questions could be addressed as part of the proceeding herein.

<sup>49</sup> November 11, 2008 e-mail of Mr. Beach to the Commission's FOIA-CEII Service Center.

#### IV. Discussion

38. Since Columbia seeks certificate authority to enlarge its Weaver storage field used for the storage of natural gas in interstate commerce subject to the Commission's jurisdiction under NGA section 7, the proposal is subject to the requirements of sections (c) and (e) of section 7 of the NGA.

##### A. Certificate Policy Statement

39. 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.<sup>50</sup> The Certificate Policy Statement explains that in deciding whether to authorize the construction of major new pipeline 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 avoidance of unnecessary disruptions of the environment, and the unneeded exercise of eminent domain.

40. Under this policy, the threshold requirement for pipelines proposing new projects is that the pipeline 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 we proceed to complete the environmental analysis where other interests are considered.

41. As stated, the threshold requirement 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

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<sup>50</sup> *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227, at 61,748 (1999); *order on clarification*, 90 FERC ¶ 61,128 (2000); and *order on clarification*, 92 FERC ¶ 61,094 (2000) (Certificate Policy Statement).

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 systemwide rates.<sup>51</sup> Columbia's proposal to expand the Weaver storage field's certificated storage boundary and buffer zone to enable Columbia to protect the security and integrity of the storage field will improve service for Columbia's existing customers by increasing the reliability of its storage services. As we find below, the proposed project is necessary to ensure the integrity of the Weaver storage field and reliability of storage service to the benefit of all of Columbia's customers. Thus, the Commission concludes that it is appropriate to permit Columbia to roll-in the reasonable project costs as part of its storage function cost of service in its next section 4 rate proceeding, absent a significant change in circumstances. The Commission finds that the threshold requirement of the Certificate Policy Statement is satisfied.

42. We do not expect Columbia's proposed extension of its storage field boundaries to have an adverse impact on existing customers or their services.<sup>52</sup> The storage field expansion will not impact the certificated operational parameters of the storage field, nor will it degrade any existing service provided by Columbia. Further, Columbia's proposal will have no adverse impact on other pipelines or their customers.

43. However, issues have been raised regarding the impact of Columbia's proposal to extend the boundaries of its Weaver storage field on landowners and communities. Interden contends that its significant capital investment in acquiring, drilling, and constructing production assets will be adversely impacted. Interden states that it owns

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<sup>51</sup> Certificate Policy Statement, 88 FERC ¶ 61,227 at 61,747, n.12 (1999).

<sup>52</sup> Columbia provided no cost information in its filing, since it was not contemplating the construction of any new facilities in conjunction with its proposal. That does not mean, however, Columbia may not incur perhaps significant expense in acquiring the property rights necessary for its proposed storage field boundary expansion. As indicated, since the purpose of this project is solely to improve the reliability of existing customers' storage service, there will be a presumption that Columbia will be allowed in a future rate case to roll its costs into its system-wide rates, absent a material change in circumstances. However, that presumption will be subject to challenge to the extent Columbia's customers do not think the total costs are reasonable and commensurate with system benefits. No existing storage customer filed to intervene or protest Columbia's proposal.

several additional producing natural gas wells in the area besides the Van Wade wells, owns or controls significant undeveloped lease acreage it intends to develop, and has heavily invested in the construction of local infrastructure to move the gas from the production area to market.

44. Van Wade states that he will not only lose the royalty payments from numerous natural gas producing wells on his property, but also the use of the discounted natural gas from these wells he purchases and receives from Interden. Van Wade states that his nursery business consists of three houses, an office complex, a large storage and maintenance facility, 70 greenhouses, and three large polycarbonate greenhouses, all of which depend on gas for heating. Van Wade contends that his continued successful and economical operation of such a large facility is jeopardized by Columbia's proposal.

45. Like Van Wade, the other landowners assert that Columbia's proposal will deprive them of their private mineral rights and royalty income for those mineral rights, and the readily available and inexpensive source of natural gas that is used to heat homes and businesses and to dry farmers' grain. The landowners contend that the loss of these mineral rights and economical natural gas could cause businesses, such as Van Wade's nursery operation and the Mellot Family Trust's farming operation, to fail leading, in turn, to unemployment and a decline in the economic health of the individual townships. The landowners also allege that Columbia's proposal will cause property resale values to suffer. Additionally, some landowners are concerned that they will be restricted in the use of their land, or that there will be above- or below-ground disturbances to their property. Finally, many of the landowners believe that Columbia's proposal is nothing more than an unjust attempt at a massive "land grab" for the mere purpose of increasing Columbia's corporate profits.

46. Columbia responds that the focus of the Commission's review must remain the protection of interstate natural gas storage field integrity in the face of a showing of third-party intrusion, since its storage fields are among the most critical components of Columbia's ability to meet its contractual service obligations to its customers, who, in turn, serve millions of individual customers of their own.<sup>53</sup> Columbia states that it must defend its storage assets from losses to ensure the operational integrity of its storage operations and Columbia's ability to meet its service obligations. Columbia also states that all affected landowners and mineral rights owners will be offered a storage lease or easement for its acquisition of the required mineral rights. Columbia further explains that it intends to negotiate in good faith with the mineral owners for the storage leases and

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<sup>53</sup> Columbia's April 4, 2008 answer.

views the use of eminent domain authority as a last resort to obtain the mineral rights after continued attempts at negotiation are unsuccessful.

47. Virtually all of the potential impacts of Columbia's proposed extension of the Weaver storage field boundaries raised by Interden, Van Wade, and the other affected landowners are economic impacts to their mineral rights for which they will be compensated, either through negotiation with Columbia of storage leases or easements or through the eminent domain process in state or federal court.<sup>54</sup> 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, which may include the value of use of the Clinton formation as a storage reservoir. While some landowners are concerned that they may not be adequately compensated for their property and mineral rights, the sufficiency of compensation is a contractual matter between Columbia and the landowners or, if agreement is not reached, a matter for a court with appropriate jurisdiction and not an issue over which the Commission has jurisdiction. With respect to the landowners' concerns regarding their loss of inexpensive natural gas service from Interden, we note that the landowners may apply the compensation they receive from Columbia for their gas and mineral rights toward the purchase of natural gas service from other natural gas providers.

48. The Commission examined Van Wade's and OPORR's assertion that the extent of the landowner impact will cause a negative economic impact on the community as a whole. The extension of the boundary of the Weaver storage field does not require the closing of businesses or the sale of landowners' land and homes, or directly impact any community facility or program. The landowners' arguments are speculative that loss of "discounted" natural gas service or royalty payments resulting from the extension of the storage field boundaries will cause businesses to fail and individuals to lose their homes or farms, leading to unemployment and other economic problems. As noted, landowners will be compensated for their loss of native gas and other mineral rights either through

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<sup>54</sup> Under section 7(h) of the NGA, 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.

negotiations with Columbia Gas or in eminent domain proceedings. There is also no evidence that the compensation the landowners will receive from Columbia or the court for any native gas or other mineral rights will be inadequate for them to maintain their homes or businesses.<sup>55</sup> Thus, the Commission does not believe that any adverse impacts on the economic health of the affected communities outweigh the need for Columbia's storage field boundary expansion project to insure the integrity of its storage field and protection of its customers' gas.

49. In addition, the Commission concludes that Columbia has sought to minimize the impact of its proposal on Interden and the landowners. Columbia is seeking only the right to utilize the Clinton 1 formation for its storage of natural gas. Such use does not entail above- or below-ground disturbances to landowners' property, and with the exception of limited surface access rights, will not interfere with the landowners' actual use of their land. Columbia plans to acquire from landowners and mineral owners only the rights needed to ensure the integrity of its existing storage operations in the Clinton 1 formation.<sup>56</sup> Thus, landowners who wish to drill and produce natural gas would maintain all rights they now have to contract to produce gas from those other formations, and existing producer-owned wells operating within the boundary would be free to use and develop any formation except the Clinton 1 formation.<sup>57</sup> In fact, Columbia states that it considered as an alternative, but rejected, the outright purchase of all property and production rights in the area of the boundary change. Columbia explains that acquiring full ownership and complete control of all production wells (approximately 10 wells) and

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<sup>55</sup> The landowners receive royalty payments and "inexpensive gas service" from Interden for the production of gas from the Van Wade wells. As discussed above, to the extent that the gas produced from the Van Wade wells belongs to Columbia, the Commission does not believe that the landowners' loss of royalty payments or inexpensive gas is an economic impact from which they should be shielded.

<sup>56</sup> In the information sheet it mailed to landowners and filed on October 20, 2008, Columbia states that production formations exist above and below the Clinton sandstone.

<sup>57</sup> However, Interden argues that Columbia's argument that Interden will still have the right to produce gas from formations other than the Clinton 1 is disingenuous. It asserts that the only formation that the Interden wells can produce from is the Clinton formation, so that preventing Interden from developing that formation destroys the entire value of the wells. *See* Interden's August 1, 2008 Comments at 3 to Columbia's July 25, 2008 response. While Interden's assertion may be correct, these economic impacts are properly raised in eminent domain proceedings.

the necessary property and mineral rights for all potential production from all underground formations within the 3,000 acre boundary would burden it with property and mineral rights ownership that are not needed and not a part of its primary storage business.<sup>58</sup> Columbia has also minimized the impact of its proposal by limiting the extent of the reservoir boundary. Moreover, with respect to the protective boundary, Columbia considered several alternatives to the need for a one-mile buffer zone, none of which it determined, as discussed *infra*, are economically or environmentally justified.

50. Under the Certificate Policy Statement, the Commission will not issue a certificate of public convenience and necessity authorizing a project, with the concomitant right to obtain the necessary property rights through either negotiation or the eminent domain process, unless the Commission finds that the project benefits the public and is in the public interest, and that the overall public, not private, benefits of the project outweigh the potential adverse impacts.

51. The Commission has recognized that underground natural gas storage fields are an essential part of the natural gas storage infrastructure.<sup>59</sup> A storage company, like Columbia, injects its customers' natural gas into the storage field during warm months when the demand for natural gas is historically low, and withdraws the stored gas during the cold months to enable its storage customers to meet the heating needs of their customers. Natural gas storage is critical in ensuring that overall demands and specific requirements of natural gas customers are met.

52. Columbia's storage customers are primarily local gas utilities who use the storage services to supplement the winter heating needs of their customers – the homes, businesses and industries of Ohio and other states. Columbia has a responsibility to protect the natural gas that its customers have entrusted to Columbia to store for them in the Weaver storage field, and has a responsibility to maintain the integrity of the storage reservoir to that end. Thus, since evidence shows storage gas migration outside of the boundary of the storage field,<sup>60</sup> Columbia has acted appropriately in seeking to redefine

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<sup>58</sup> See July 25, 2008 Data Response of Columbia, Data Request No. 3.

<sup>59</sup> See *Rate Regulation of Certain Natural Gas Storage Facilities*, Order No. 678, FERC Stats. & Regs. ¶ 31,220, *order on clarification and reh'g*, Order No. 678-A, 117 FERC ¶ 61,190 (2006).

<sup>60</sup> The Commission's decision in this proceeding is based on the scientific evidence that was made part of the record.

the boundary of the storage field to include the gas that has migrated. Columbia is obligated to protect the integrity of the storage field and such preservation of the storage field's integrity benefits the customers of the local distribution companies storing gas in the Weaver storage field.

53. The Commission has balanced the interests of Interden, Van Wade, and the other landowners and holders of property interests against the public benefits of a secure Weaver storage field, and finds that the potential adverse economic impacts to their interests are outweighed by the substantial public benefits associated with the need for Columbia to protect the integrity of the Weaver storage field.<sup>61</sup> Accordingly, in view of the above considerations, and as further supported below, the Commission finds that Columbia's proposed expansion of the boundaries of the Weaver storage field is consistent with the Certificate Policy Statement and is required by the public convenience and necessity.<sup>62</sup>

#### **B. Engineering Analysis**

54. There is an inherent uncertainty regarding the performance of an underground reservoir; its actual boundaries depend on characteristics that can generally be confirmed only after the facility has commenced operation. Thus, it is not unusual to find that when a storage facility commences operation, the initially designated boundaries of the underground reservoir do not confine gas volumes as anticipated. Similarly, after years of reliable operation, the equilibrium of a previously stable storage reservoir can shift, due to varying causes, permitting gas that had been reliably contained to escape confinement. In such cases, to ensure the integrity of the storage reservoir and the efficient operation of the storage facility, we typically either revise a storage facility's

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<sup>61</sup> The Commission finds no evidence that Columbia is proposing to extend the boundaries of the Weaver storage field to acquire the property and mineral rights of landowners for the purpose of producing natural gas or to increase its storage operations or for its own corporate gain, as the parties have alleged. The protestors have provided no evidence to indicate that Columbia intends on utilizing the property interests that it seeks for any other purpose than to insure the integrity of its existing storage operations. Additionally, while Mr. Beach speculates that Columbia may be seeking additional property rights for the potential use of carbon sequestration, Mr. Beach's speculative accusation is not material to our considerations in this proceeding.

<sup>62</sup> Certificate Policy Statement, 88 FERC ¶ 61,227 (1999); *Southern Star Central Gas Pipeline, Inc.*, 115 FERC ¶ 61,219 (2006).

certificated boundaries to conform to the enlarged contours of the actual underground reservoir<sup>63</sup> or alter the operating parameters of the storage facility to prevent gas from migrating beyond the facility's certificated boundaries.<sup>64</sup>

55. 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.<sup>65</sup>

56. The Commission's staff analyzed Columbia's proposal, the well logs, geotechnical maps and gas composition analyses which Columbia submitted with its application, comments from various landowners, and the data responses of Columbia and OPORR to staff's data requests seeking additional information to supplement the record. Based upon the information provided by Columbia, Van Wade, and OPORR, the Commission finds that storage gas has migrated outside the certificated boundaries of the western portion of the Weaver storage field, such that the storage reservoir has expanded over time to the west and is larger than originally estimated when the storage field was certificated. The Commission also finds that Columbia's proposed reservoir and protective boundaries are reasonable. These issues are discussed below.

**1. Expansion of the Storage Reservoir: Evidence of Gas Migration**

**a. Storage Field Geology – Clinton Sandstone Formation**

57. In the Weaver storage field, Columbia uses the Clinton 1 sandstone formation for its underground gas storage operations. Gas migration is the movement of gas within or

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<sup>63</sup> See, e.g., *Williston Basin Interstate Pipeline Co.*, 127 FERC ¶ 61,045 (2009); *Dominion Transmission, Inc. (Dominion)*, 100 FERC ¶ 61,168 (2002); *Williams Natural Gas Co.*, 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).

<sup>64</sup> 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.

<sup>65</sup> *ANR Pipeline Co.*, 76 FERC ¶ 61,263 at 62,346.

through a formation. For gas migration to occur, there must be a continuous permeable path for the gas to flow along, either through the same formation or into another formation. There also must be a negative pressure gradient from the donor formation or area to the recipient formation or area, since gas will only flow from high pressure areas to lower pressure areas, as nature seeks equilibrium.

58. As noted, *supra*, Columbia filed with its application geologic information in the form of structural and isopach maps of the storage field and the Clinton 1 sandstone; well completion reports and well logs for Storage Well 10929 and the three Van Wade production wells; and a four-well stratigraphic cross-section using the data from the well logs. This substantial geologic information supports Columbia's claim of storage gas migration as the cause of pipeline-quality gas being present in Interden's production wells, by explaining how and why storage gas could migrate from the Weaver storage field to the Van Wade wells.

59. The isopach map, showing the thickness of the Clinton sand formation, reflects that the Clinton 1 sand formation extends beyond the western confines of the current storage field protective boundary, and that the formation is largely continuous from the storage field to the three Van Wade wells, and beyond (which, as discussed *infra*, necessitates the proposed protective boundary).<sup>66</sup> Thus, the formation continues in a virtually uninterrupted fashion from the storage field to the Van Wade production wells, making it possible for gas to migrate from Columbia's storage wells into Interden's production wells.<sup>67</sup> Further, it is not only possible for Columbia's storage gas to migrate to Interden's production wells, such migration is likely, since the well completion reports and logs<sup>68</sup> and four-well stratigraphic cross-section<sup>69</sup> confirm that Columbia's storage wells and Interden's Van Wade #3, #5, and #6 wells are all completed in the Clinton 1 sand formation.<sup>70</sup> In other words, the stratigraphic cross-section confirms that the

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<sup>66</sup> Columbia's application, Exhibit Z-2.

<sup>67</sup> The isopach map reflects only a few nodes of unconformity within the known area of the Clinton 1 formation where the Clinton 1 formation is not present.

<sup>68</sup> Columbia's application, Exhibit Z-3.

<sup>69</sup> Columbia's application, Exhibit Z-4.

<sup>70</sup> Columbia's application, Exhibits Z-3 and Z-4. The stratigraphic cross-section in Exhibit Z-4 uses the formation gamma ray values associated with sandstone, limestone, dolomite, and shale from the well logs in Exhibit Z-3 to compare the gamma ray curves

Clinton 1 sandstone extends westward to the area of the Van Wade production wells, while the isopach map demonstrates that the Clinton 1 sand forms a continuous, connected path allowing communication between the production wells and Columbia's storage field.

60. Moreover, the maximum certificated storage pressure of the Weaver storage field is 1,150 psi. This value is significantly higher than the operating pressures of the Van Wade production wells.<sup>71</sup> As a result of this pressure difference, and the communication between the production wells and storage field, gas will flow from the high pressure storage field to the lower pressure zone of the production wells. Inasmuch as the Van Wade production wells are located near the Weaver storage field, they are ideally situated to produce storage gas that has migrated from the storage reservoir.

61. Mr. Beach contends that Columbia's gas migration theory is flawed because the Clinton reservoir is a "tight" sandstone formation and is made up of multiple lenses that are largely discontinuous.<sup>72</sup> Similarly, OPORR asserts that "it is almost impossible for storage gas to migrate over a mile through a relatively tight Median-Clinton sand formation, especially at the pressures in question." Essentially, these parties argue that storage gas could not have migrated from the storage reservoir to the production wells in only seven years because the formation is not permeable enough and is comprised of disconnected sandstone lenses.

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of Columbia's Storage Well 10929 and the three Van Wade wells. Gamma ray logs are commonly used to determine the depths of stratigraphic formations by measuring the differences in natural gamma ray emissions from different rocks.

<sup>71</sup> Van Wade's July 30, 2008 data response indicates the operating pressure of the Interden wells to be up to 800 psi.

<sup>72</sup> Mr. Beach quotes from the Society of Petroleum Engineers, SPE 29159: Reservoir Characteristics, which states that: "[t]he Clinton reservoir is a tight gas sandstone. Sand occurs in lenses and is largely discontinuous from one well to another." Mr. Beach's August 18, 2008 comments at 2. Mr. Beach also includes in his comments an excerpt from The Atlas of Major Appalachian Gas Plays, Ohio Department of Energy & Gas Research Institute, which states that the Clinton sandstone beds cannot be correlated between wells, and are composed of disconnected sandstone lenses. It also states the "lateral and vertical discontinuities of the individual sandstone bodies and wide variations in porosity and permeability are also recognized in southwestern Ontario."

62. Mr. Beach's and OPORR's assertion that the Clinton formation is too "tight" for any gas migration is not supported by any evidence in the record. The parties did not provide any information regarding the porosity or permeability of the Clinton formation, nor did they provide any evidence that supports the assertion that it would be impossible for gas to migrate into the production wells. Tight gas reservoirs are typically defined as exhibiting an in-situ permeability of less than 0.1 millidarcies (md).<sup>73</sup> Given a large enough pressure gradient, gas can flow through these tight formations, even though a typical operator would fracture the formation, creating cracks or fissures to open new flow channels, in order to use a lower pressure differential. Therefore, the fact that the Clinton sandstone can have permeability up to 15 md<sup>74</sup> indicates gas migration is possible through the formation. Further, it is possible that production wells both inside and outside the storage reservoir were fractured in order to increase the permeability of the Clinton formation.

63. With respect to Mr. Beach's argument that Columbia's storage gas could not have migrated to Interden's production wells because the Clinton sandstone is discontinuous, Mr. Beach relies on a general fact applicable to portions of the Clinton sandstone to claim that the Clinton 1 formation in this small portion of central Ohio is discontinuous. It is true that the Clinton sandstone, on the whole, is largely comprised of discontinuous lenses and is discontinuous laterally and vertically. However, the Clinton sand is a large formation that covers a 17,000 square mile region (approximately 11 million acres) of western New York, northwestern Pennsylvania, eastern Ohio, and a small part of western West Virginia.<sup>75</sup> The evidence Columbia has submitted in this case shows that the relatively small, 68-square mile portion (approximately 44,000 acres) of the Clinton sand

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<sup>73</sup> *Reservoir: Modeling Permeability in Tight Gas Sands Using Intelligent and Innovative Data Mining Techniques*, Society of Petroleum Engineers (2009).

<sup>74</sup> *Lower Silurian Clinton Sandstone Geology and Petroleum Production in Eastern Ohio*, American Association of Petroleum Geologists Bulletin Volume 58, (1974).

<sup>75</sup> See *Possible Continuous-Type (Unconventional) Gas Accumulation in Lower Silurian "Clinton" Sands, Medina Group, and the Tuscarora Sandstone in the Appalachian Basin: A Progress Report of 1995 Project Activities*, U.S. Geologic Survey (1996)

formation that Columbia uses for its storage operations<sup>76</sup> and which includes the area where Interden's Van Wade production wells are located is, in fact, continuous and enables communication between Columbia's storage wells and the Van Wade wells. Further, the protestors have provided no data indicative of the impediments to the flow of gas they state exist.<sup>77</sup>

64. Moreover, while the landowners contend, without evidentiary support, that it is virtually impossible for storage gas to have migrated to Interden's production wells due to the geology of the storage formation the landowners' own gas composition analysis strongly indicates, as discussed below, that storage gas did, in fact, migrate outside the storage reservoir into the production wells. Further, none of the parties provided additional compositional or geologic data that contradicts the data provided by Columbia, which indicates gas migration from the storage field to the Van Wade wells.

#### **b. Gas Compositional Analysis**

65. All of the gas at issue here is contained within the Clinton sandstone formation. Natural gas stored by Columbia has a different chemical composition than natural gas that is native to the Clinton sandstone formation. Natural gas that Columbia injects into its storage fields is pipeline-quality gas. Pipeline-quality gas is created by gathering a variety of native gases and then processing them into a marketable quality gas that is nearly all methane, with predictable minor amounts of other gases. In other words, pipeline-quality gas entering the transmission pipeline is native gas that has had nearly all of its inert gases and heavier hydrocarbons removed in order to provide a consistent quality gas for end use appliances, factories, and chemical plants. Thus, as Columbia describes in its application, native natural gas from the Clinton sandstone has a higher

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<sup>76</sup> The Weaver storage field is an approximately 68-square mile geologic structure covering approximately 44,000 acres.

<sup>77</sup> The Society of Petroleum Engineers source quoted by Mr. Beach is a study performed on a large Clinton sand gas storage field in northeastern Ohio. It is primarily an examination of increased production as a result of refracturing previously fractured storage wells. The study was an effort to determine the efficacy of refracturing activities. As most of the wells were refractured, some up to three times, the need for post-fracture well performance estimates and optimal fracture design was examined to maximize deliverability gain. The performance of the wells absent the fracturing process was not examined, and would have been irrelevant to the study. Thus, this study is not material to, and does not support, Mr. Beach's claim.

content of heavier hydrocarbons, such as ethane and propane, compared to pipeline-quality gas injected into storage, and a noticeably lower methane content than injected, pipeline-quality storage gas.<sup>78</sup> Further, carbon dioxide is nearly non-existent in native gas produced from the Clinton sandstone, but is present in predictably consistent volumes in storage gas. Therefore, when production wells are located adjacent to a storage field, a change in certain constituents of a gas sample obtained from the production wells, such as an increase in methane content, an appreciable increase in the carbon dioxide content, and/or a decrease in nitrogen and heavy hydrocarbon content signals encroachment of storage gas into the stream of gas flowing from the production well, and that communication exists between the producing well and the adjacent storage reservoir.

66. Columbia obtained gas samples from the Van Wade #3, #5, and #6 production wells in 2002 and 2006, and analyzed the change in the chemical composition of those samples between 2002 and 2006 using a gas chromatograph at a Columbia laboratory. In addition, in April 2007, Columbia obtained another set of samples from the three production wells and sampled gas from one of its storage wells (Storage Well 10929) in order to compare the composition of the gas from the production wells with the composition of the storage gas and to further verify the trend of the changes in chemical composition of gas in the production wells. The analysis of the 2007 samples from the storage and production wells was verified by Isotech Laboratories (Isotech) to ensure that the results were accurate. Isotech's 2007 compositional analysis was consistent with Columbia's 2006 results.

67. Additionally, the landowners took gas samples from the Van Wade #3, #5, #6, and #7 wells on June 24, 2008, and sent the samples to Isotech, who performed a compositional analysis. The landowners provided these results to the Commission in their July 30, 2008 data response.<sup>79</sup>

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<sup>78</sup> Exhibit Z-1, Sheet Nos. 1-2.

<sup>79</sup> Van Wade and OPORR filed the analysis of the landowners' sampling as privileged. Columbia filed a FOIA request for the landowners' data in FOIA No. FY08-93. Columbia's FOIA request for the information was granted and the Commission issued its notice of release to Van Wade on October 16, 2008, indicating the data would be released after five days from the date of the notice of release. As such, the information is available to the public and we rely on, and include, this data in the analysis below.

68. The compositional data Columbia submitted from its 2002, 2006, and 2007 samples, as well as the compositional data from the landowners' 2008 samples, indicate that storage gas is present in Interden's production wells, and has therefore migrated from the Weaver storage field to the producer's wells.<sup>80</sup> Specifically, the data show that methane, ethane, propane, nitrogen and carbon dioxide content of gas from the Van Wade #3 and #5 wells now more closely resembles storage-quality gas than the original samples of native gas produced in 2002.<sup>81</sup> Native natural gas from the Clinton sandstone typically has a methane content between 79 and 86 percent<sup>82</sup> but, by 2007, gas sampled from the Van Wade #3 and #5 wells had a methane content of 93 percent, virtually the same as the 94 percent methane content of Columbia's Storage Well 10929. Similarly, from 2002 to 2007, ethane and propane content decreased significantly in the Van Wade #3, #5, and #6 wells. Further, the nitrogen and carbon dioxide content also shifted significantly in the direction of storage gas. The changes in composition were not as significant in the Van Wade #6 well, but geologic information explains why gas has not migrated as effectively toward the Van Wade #6 well.<sup>83</sup> However, the trend in the composition of gas in the Van Wade #6 well nonetheless also indicates a presence of storage gas.

69. Interden, Van Wade, OPORR, and various landowners dispute the adequacy of Columbia's compositional analyses to prove that Columbia's storage gas has migrated

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<sup>80</sup> See Exhibit Z-1, Sheet Nos. 3-8.

<sup>81</sup> These graphs were created using the compositional data Columbia filed in Exhibit Z-1, and are similar to the bar graphs on Sheet Nos. 4-8 of Exhibit Z-1, and include the compositional data from gas samples taken from the Van Wade #3, #5, and #6 wells by the landowners in 2008.

<sup>82</sup> See Exhibit Z-1, Sheet No. 1. This information is confirmed by the December 2008 samples taken of production wells operated by AB Resources and GeoPetro.

<sup>83</sup> There is a node of unconformity in the Clinton formation (a location where sediment depositions were not continuous), at which the Clinton sandstone ceases to be present, which lies directly between the Van Wade #6 well and the injection wells serving the storage field. This anomaly necessitates a longer path for the storage gas to travel in order to be produced from the Van Wade #6 well in the same quantities as in the Van Wade #3 and #5 wells. There is still a minor, but statistically significant, trend in the composition of the gas produced from the Van Wade # 6 well toward the composition of the stored gas.

and is being produced by Interden's production wells. They contend that Columbia's data reflects only marginal changes in the composition of gas produced by Van Wade #3, #5, and #6 wells, and that a comparison and analysis of gas samples from only three wells on a single 80-acre tract of land is too limited to properly determine whether the storage field has expanded. They also assert that Columbia's analyses were not subject to examination, or reviewed and tested for failures in methodology and results.

70. The criticisms of Columbia's composition analyses are undercut by the fact that the landowners' compositional analysis of their own samples from the Interden production wells confirm Columbia's analysis and findings and likewise demonstrate that gas has migrated beyond the existing Weaver storage field boundaries. With respect to the Van Wade #3 and #5 wells, the data and results submitted by the landowners are virtually identical to the data submitted by Columbia.<sup>84</sup>

71. Moreover, in December 2008, Columbia and Interden took joint samples of two Columbia storage wells, five Clinton sandstone production wells that have not shown any communication with the Weaver storage facility,<sup>85</sup> and five Interden production wells including the Van Wade #3, #5, and #6 wells. The sampling was conducted by an independent contractor from Civil and Environmental Consultants Inc. and sent to Isotech for analysis. At all times, a representative from Interden was present to witness the sampling. Columbia filed the Isotech data and analysis and its discussion of the results in its February 26, 2009 supplement to its application.

72. The analysis of the joint December 2008 gas samples also indicates that storage

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<sup>84</sup> The data submitted by the landowners for the Van Wade #6 well did not show significant changes in gas composition between 2002 and 2008. However, as noted above, the geologic structure of the Clinton sandstone explains why gas migration occurred more slowly in the Van Wade #6 well. The landowners also submitted gas composition results for the Van Wade #7 well. Well completion reports from the State of Ohio indicate that the production formation for the Van Wade #7 well is the Trempealeu formation, not the Clinton formation. The Trempealeu formation is approximately 2,000 feet below the Clinton formation. Columbia does not propose, nor does its certificate allow, expansion of the Weaver storage field downward into additional formations. Further, there is no evidence of gas migration into the Trempealeu formation. Therefore, gas compositional data for the Van Wade #7 well is not relevant here.

<sup>85</sup> The five wells that were sampled are operated by GeoPetro and AB Resources.

gas has migrated into the Van Wade wells. The December 2008 analysis includes analysis of the Carbon 13 isotope of methane. This isotope is a unique identifier for different varieties of methane gas. Isotech describes this component as an “isotopic fingerprint.” Isotech uses an ethane/methane ratio as a basis for comparison to the Carbon 13 isotope value to distinguish storage gas from production gas. Based on the compositions of the gas analyzed by Isotech, it is clear that the Van Wade #3 and #5 wells are producing storage gas. Further, the data also indicate that significant quantities of storage gas are present in the Van Wade #6 well.

73. Thus, Columbia’s data, the landowners’ data, and the Columbia-Interden joint data all demonstrate that storage gas from Columbia’s Weaver storage field is present in Interden’s Van Wade #3 and #5 production wells. Columbia’s data reflects that storage gas is also present in significant quantities in the Van Wade #6 well. Accordingly, all of the compositional data submitted by the parties indicate that storage gas has migrated outside the current boundary of the Weaver storage field.

74. With respect to the alleged inadequacy of the data, the Commission does not consider the compositional changes of the gas in the production wells from 2002 to 2006 reflected by the data to be “marginal,” as characterized by the landowners. Rather, with the exception of the data for the Van Wade #6 well, all of the data, including the landowners’ data, reflect dramatic shifts over time in the composition of gas from Interden’s production wells toward that of storage gas. The compositional changes in gas produced by the Van Wade #3 and #5 wells between 2002 and 2007 reflected by Columbia’s data show a more than 150 percent increase in carbon dioxide content, an 80 percent decrease in nitrogen content, a 50 percent decrease in propane content, a 40 percent decrease in ethane content, and a seven percent increase in methane content. Each of the values related to the hydrocarbon and inert gas components of the 2007 gas samples taken from the Van Wade #3 and #5 wells fall within the range of values that are characteristic of Columbia’s pipeline-quality storage gas.<sup>86</sup>

75. Van Wade faults Columbia for relying on gas samples from only three production wells to demonstrate that the Weaver storage field is larger than its current boundary. However, compositional changes in gas from even a small sampling of wells, all situated on one small tract of land, are enough to show the storage field has expanded beyond its existing boundaries, if those wells are located outside the existing storage field boundaries. Any migration of storage gas outside of the certificated storage boundary is sufficient to prove that the storage field has expanded at least as far as that point at which

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<sup>86</sup> See Exhibit Z-1, Sheet No. 1.

the gas is found. It is not necessary to show pervasive migration to justify expanding a storage reservoir boundary to the points where storage gas has actually migrated.<sup>87</sup> Here, the Van Wade #3, #5, and #6 wells are close to Columbia's existing protective boundary, and the presence of storage gas in those wells demonstrates that gas has migrated at least as far as those wells. Hence, Columbia proposes a new reservoir boundary to extend just beyond the three production wells.<sup>88</sup>

76. Finally, Interden contends that there could be other explanations for a change in certain constituents of a production well sample toward that of storage gas besides the migration of storage gas. However, Interden and the landowners have not provided any reasonable explanations, nor have they provided evidence showing that gas has not migrated to Interden's Van Wade production wells. Rather, their evidence demonstrates the existence of gas with a composition nearly identical to storage gas being produced from the Van Wade wells. Given the location of the wells to the storage field near the

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<sup>87</sup> Nor is it necessary for Columbia to provide evidence showing that the native gas in the Clinton formation is depleted beyond economic recovery in the proposed expansion area, as OPORR asserts is required. *See* OPORR's August 15, 2008 comment letter. Native gas in the Clinton formation need not be depleted for storage gas to have migrated to the Van Wade wells and to be produced by those wells, along with native gas. The parties also appear to believe that a quantification of the amount of gas that has migrated to, and is being produced by, the Van Wade production wells must be determined before a finding can be made that storage gas has migrated and the storage field has expanded. *Id.* and OPORR's August 29, 2008 comment letter. While the question of what percentage of gas being produced by each of the Van Wade wells is native gas versus storage gas will be relevant to the valuation of property owners' mineral rights in any easement negotiations or eminent domain proceedings, the extent of migration and amount of storage gas present in each well is not relevant to the issue of whether storage gas has in fact migrated. Any amount of storage gas contained in or being produced by the Van Wade production wells indicates that storage gas has migrated from Columbia's storage field and justifies extending the existing boundary to protect the integrity of the storage field.

<sup>88</sup> Van Wade and the other landowners also contend that the sampling of gas from the three production wells situated on an 80-acre piece of land is too minute and localized to justify a 3,000-acre extension of the storage field boundary. This is a different question which we address below.

existing protective boundary, and the geology of the Clinton sandstone, the only reasonable explanation for the similarity in composition is that gas from Columbia's Weaver storage field has migrated to, and is being produced by, the Van Wade wells. Further, there are no countervailing factors or evidence present in this case that would otherwise explain the changes in the composition of the gas samples obtained from the Interden wells.

77. In conclusion, both the compositional and geologic information indicates that storage gas from Columbia's Weaver storage field has migrated from the storage field to Interden's Van Wade #3, #5, and #6 production wells, thereby expanding the reservoir.

**2. Extent of the Boundary Expansion: The Reservoir Boundary, Buffer Zone, and Alternatives**

78. The Weaver storage field, like most storage fields, is delineated by two different boundaries – the reservoir boundary and the protective boundary. In order for a storage reservoir to be effective, gas must be contained within a known and defined portion of the storage formation. The reservoir boundary outlines where gas in the storage field is injected and stored. When determining the capacity of a storage field, the Commission only looks to storage capacity available within the reservoir boundary. Beyond the reservoir boundary, the storage operator establishes a protective boundary. Because delineation of the outer edge of a subsurface storage reservoir boundary is not an exact science, the protective boundary is designed to accommodate that uncertainty and to protect the storage field from gas losses due to migration. The area located between the reservoir boundary and protective boundary is the buffer zone.

79. Columbia proposes to expand both the reservoir and protective boundaries of the Weaver storage field. The reservoir boundary will extend beyond the current protective boundary to include the Van Wade #3, #5, and #6 wells. The protective boundary will extend approximately one mile beyond the proposed reservoir boundary. The total amount of additional underground area (area not already included within the existing reservoir or protective boundaries) encompassed by the extension of both the reservoir and protective boundaries is 3,056 acres.

80. A number of landowners filed comments indicating their belief that the proposed extension of the reservoir boundary, by itself, equates to 3,000 additional acres, and that the proposed one-mile protective boundary from the proposed reservoir boundary adds an

additional 9,000 acres to the storage field, for a total of 12,000 additional acres.<sup>89</sup> The parties misunderstand Columbia's proposal. The 3,056 acres includes the additional acreage attributable to the proposed one-mile buffer zone, and represents the total amount of acreage (including both reservoir and protective boundaries) that is proposed to be added to the existing Commission-approved storage field map.<sup>90</sup> Since Columbia already owns the mineral rights of the storage formation within the existing buffer zone, and is only proposing to extend the reservoir boundary just outside the existing protective boundary, the expansion of the reservoir boundary adds minimal acreage.<sup>91</sup> Most of the additional 3,056 acre storage field boundary extension is attributable to the buffer zone created by the one-mile extension of the protective boundary.<sup>92</sup> While Columbia will only use a relatively small portion of the area for the actual storage of gas, it will need to acquire the property interests necessary to prevent production activities anywhere in the buffer area since such activities could cause fracturing, pressure sinks, or other problems, causing wider migration of storage gas and the need for yet an even larger buffer zone.

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<sup>89</sup> Supplemental comments filed by Interden on November 19, 2008 indicate its belief that the expansion will add an additional 6,000 acres (3,000 attributable to the reservoir boundary and 3,000 attributable to the protective boundary).

<sup>90</sup> Columbia's web site states "[t]he proposed boundary extension would encompass approximately 3,000 additional acres that are not today already within the existing reservoir or protective boundaries. Columbia determined the additional acreage by measuring the net difference between the furthest extent of the existing FERC approved boundary and the furthest extent of the proposed protective boundary." [www.ngts.com/company/weaverstorage.aps](http://www.ngts.com/company/weaverstorage.aps). See also, Columbia's February 10, 2009 Answer to Comments of Interden and Beach at 1, n.1 ("Columbia repeats that the impact of the proposed boundary extension in total is to encompass an additional 3,000 acres that is not today within either the reservoir or protective boundaries") and 5 (Columbia has requested "inclusion of 3,000 additional acres (total) in the reservoir and protective boundary areas").

<sup>91</sup> Exhibit Z-2 reflects that the reservoir boundary would be expanded by approximately one quarter of a one-square-mile parcel of land. This amounts to approximately 160 acres.

<sup>92</sup> The protective boundary would be expanded by approximately 4.5 one-square-mile parcels of land. See Exhibit Z-2. This amounts to approximately 2,900 acres.

81. The Commission must determine whether Columbia's estimations of the areas needed for the reservoir and protective boundaries are reasonable. Columbia's newly proposed reservoir boundary extends just beyond the three Van Wade wells that have been shown to contain migrated storage gas. Since storage gas is present in those wells, it is necessary for Columbia to extend the boundary of its reservoir to include those wells. This ensures that the storage gas reaching the Van Wade wells is contained within the storage boundary. As explained, Columbia has an obligation to protect the gas it stores for its customers and the integrity of the storage field. Additionally, Columbia limited its proposed reservoir boundary to the furthest point to which storage gas has been shown to have migrated and no further westward. Accordingly, the Commission finds Columbia's proposed extension of the reservoir boundary to be reasonable.

82. Mr. Beach questions what defines the extent of a storage formation, the adequacy of the Weaver storage field's ability to contain storage gas, and what Columbia's responsibility is to prevent gas migration.

83. A storage field is defined by the geology that allows gas to be contained within a particular formation. The storage field is not defined simply by the amount of mineral rights that are obtained. However, due to the uncertainty in determining the actual geologic boundaries, a reservoir boundary is only a best assessment of where the storage field contains stored gas, what part of the formation can contain gas, and the point to which the formation extends. Further, while the formation itself has not changed, Columbia's understanding of the extent of the formation has become more refined as more information has become available.

84. Columbia has operated this reservoir as a storage field since 1937, and has never before experienced the losses which have been exhibited in the past seven years. This experience is indicative of a rather well-defined containment area in this portion of the Clinton formation for it is only since the Van Wade wells have been drilled and put onto production that gas loss of the magnitude experienced of late has been noted. It is not unusual for a pressure sink such as that created by production from the Van Wade wells to cause gas to flow into areas previously outside that utilized by the stored gas. That significant losses of storage gas had not previously occurred is indicative of a well-managed gas injection and withdrawal program in this reservoir.

85. Columbia's proposed protective boundary extends approximately one mile outside of the proposed reservoir boundary and, as discussed above, accounts for most of the acreage to be added to the storage field. As part of the analysis of whether Columbia's proposed extension of the protective boundary and resultant one-mile buffer zone is

reasonable, Commission staff issued a data request to Columbia seeking the technical justification for the proposed buffer zone.<sup>93</sup> In its data response, Columbia stated its belief that

the best way to adequately protect the storage field and the gas therein is to establish a new protective boundary that is (i) located in an area beyond where the Clinton storage formation is favorably developed, and (ii) sufficiently far away from known wells where the Clinton formation is present . . . such that the risk of foreign gas production through as yet unidentified pathways is negligible.<sup>94</sup>

86. Columbia emphasizes that evaluating the extent of underground formations and where they end or cease to exist is not an exact science but involves a judgment call based on the availability and analysis of drilling logs and related well data. Columbia states that it reviewed wells drilled in and around the proposed reservoir and protective boundaries by Interden and others between 1962 and 2002.<sup>95</sup> It identified which wells have log data or other sufficient information to determine whether the Clinton formation is present, which wells have data to show the Clinton formation is absent, and wells for which information is insufficient to determine whether the Clinton formation was or was not encountered during drilling.<sup>96</sup> Based on its analysis of the drilling logs, electric logs and other well information, as well as its recent experience with Interden's Van Wade #3, #5, and #6 wells, Columbia has proposed extending the protective boundary to an area where the analysis indicates that the Clinton storage formation is not present. This proposal would place the new protective boundary approximately one mile outside of the new reservoir boundary. Columbia concluded that locating the boundary where the formation is absent, by definition, will protect the integrity of the Clinton sandstone storage field.

87. Based upon staff's analysis of the information available, the Commission finds that Columbia's proposal would extend the protective boundary, as needed, to where the

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<sup>93</sup> Staff's May 14, 2008 data request.

<sup>94</sup> Columbia's May 23, 2008 data response at 3-4.

<sup>95</sup> *Id.* at Appendix A.

<sup>96</sup> Columbia's May 23, 2008 data response of Columbia at 3 and Enhanced Exhibit Z, Sheet No. 1 (color-coded map indicating level of existing data for each well).

Clinton sandstone is discontinuous. Columbia conducted a comprehensive study of all of the wells drilled in the area and provided a reasonable analysis of the geologic information. This analysis suggests that the Clinton sandstone is probably discontinuous beyond the proposed protective boundary and is effectively sealed against any further migration by the surrounding impermeable strata. The Commission agrees that extending the protective boundary to the discontinuity where the Clinton sandstone ceases should ensure that the storage gas will be contained within the protective boundary, even if further migration occurs to the formation discontinuity.

88. Interden and the landowners contend that extending the western boundary of the Weaver storage field an additional 3,000 acres based on a limited sampling of wells obtained from a “diminutive fraction” (an 80-acre tract) of the proposed expansion area is unreasonable.<sup>97</sup> However, the 3,000-acre extension of the storage field is the result of an effort to provide a buffer zone. As clarified above, the gas sample data dictate that the reservoir boundary within which Columbia is authorized to store gas be extended only approximately 160 acres beyond the existing storage field boundary to encompass the three Van Wade wells. Thus, most of the 3,000 additional acres added to the Weaver storage field is attributable to the establishment of the new protective boundary and one-mile buffer zone.

89. The Commission has sanctioned the use of buffer zones for storage fields as necessary because, even when nearby production activities do not threaten to compromise the integrity of the storage field, it is impossible to determine with absolute certainty the edge of a storage formation.<sup>98</sup> Columbia’s proposed one mile extension of the protective boundary, creating a one-mile buffer zone, constitutes a reasonable estimate of the area necessary to preserve the integrity of the storage field. As indicated above, the degree of extension of the protective boundary is not the product of the gas compositional analysis of the three Van Wade wells. Rather, the proposed protective boundary lies at the very first location, extending west of the Van Wade wells, where geologic data demonstrate that the Clinton formation is absent, and a reasonable distance from a known Interden well completed in the Clinton formation further west than the Van Wade Wells

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<sup>97</sup> Van Wade’s March 25, 2008 protest.

<sup>98</sup> See *ANR Pipeline Co.*, 76 FERC ¶ 61,263 (1996); *reh’g denied*, 78 FERC ¶ 61,122 (1997); *Williams Gas Pipeline Central, Inc.*, 95 FERC ¶ 61,028 (2001); and *Williams Natural Gas Pipelines Central, Inc.*, 83 FERC ¶ 61,120 (1998).

(Interden's Oyster #2 well (P-723)).<sup>99</sup> The Commission therefore believes that Columbia has appropriately minimized the proposed expansion of the storage field footprint while protecting the storage gas contained in the Clinton 1 storage reservoir. In addition, the proposed one-mile buffer zone is consistent with Columbia's existing one-mile buffer zone.

90. Interden maintains that Columbia has not adequately explained why the alleged gas migration experienced at its Weaver storage field cannot be adequately addressed by field pressure controls, rather than the creation of a buffer zone.<sup>100</sup> In its response to staff's data requests, Columbia examined several alternatives to determine if a smaller protective boundary could be achievable.<sup>101</sup> Specifically, Columbia considered: (1) converting existing storage high-pressure injection/withdrawal wells to low-pressure withdrawal-only wells (counter storage alternative one); (2) drilling new wells to serve as low-pressure withdrawal-only wells (counter storage alternative two); (3) taking the west side of Weaver storage field out of injection service; and (4) purchasing outright all production wells and production rights in the affected area. Columbia concluded that each alternative would be economically inefficient, costly, and/or impose additional burdens on surface landowners and the environment.

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<sup>99</sup> See Exhibit Z-2, and May 23, 2008 Data Response of Columbia at 4-6. Interden's Oyster #2 well is approximately half way between the proposed reservoir and protective boundaries. It was not included in the new reservoir boundary due to the absence of significant gas production.

<sup>100</sup> Interden's August 1, 2008 Comments at 4. Interden also argues that Columbia cannot justify its rejection of alternative storage options on grounds that they are not cost efficient without any assessment of the expected costs of obtaining the mineral rights in the Clinton formation from Interden and the other landowners. Once Columbia has determined how much it will cost to acquire the necessary property interests for the proposed expansion of the storage field boundaries, it can reassess the alternatives. However, the alternatives either would have environmental impacts (whereas expanding the currently certificated boundaries would have none), fail to achieve the purpose of Columbia's present proposal, or adversely impact Columbia's ability to provide service, as discussed herein.

<sup>101</sup> May 23, 2008 Data Response of Columbia, Data Request No. 1, and July 16, 2008 Data Response of Columbia, Data Request No. 2.

91. As described in Columbia's July 16, 2008 data response, the first alternative would entail Columbia's conversion of 13 existing injection/withdrawal wells located nearest the Interden wells immediately adjacent to the existing storage field protective boundary to low-pressure "withdrawal only" wells. In addition, a separate low-pressure pipeline network would have to be constructed to allow these wells to be placed on a continuous withdrawal mode. This continuous withdrawal mode would act as an artificial boundary to capture gas injected elsewhere in the field before it reached the edge of the natural or geologic boundary.

92. However, the closest interconnection to a low-pressure pipeline system is located eight miles to the east in the Mohican Memorial State Forest (Mohican Forest), an environmentally sensitive area. Thus, a new counter storage system would require construction of eight miles of eight-inch diameter pipeline, a meter station, and gas conditioning equipment to connect to this existing low-pressure pipeline. Three of the eight miles of pipeline would have to be constructed within the Mohican Forest. The pipeline would most likely be constructed within new rights-of-way, potentially resulting in the loss of 15 to 20 acres of trees within the Mohican Forest, as well as an additional 30 acres adjacent to the forest. This region of Ohio has documented Indiana bat capture sites, as well as several areas of high potential habitat for this species, although specific risks to these species cannot be evaluated until the pipeline route is identified and studies performed. Columbia estimates the cost of the pipeline, meter, and associated equipment to be approximately \$20 million.

93. Additionally, the conversion of the high-pressure injection/withdrawal wells to counter storage wells would result in the loss of 11.8 MMcf per day of deliverability and 907 MMcf of storage capacity. Columbia asserts that it does not have latent storage capacity to offset this significant loss. Accordingly, Columbia would need to make detailed studies to determine where new storage could be built to replace the lost deliverability and capacity. Columbia contends that its initial estimates indicate the cost would be roughly \$25 million to construct 11.8 MMcf per day of deliverability and 907 MMcf of capacity on Columbia's system. Columbia estimates that the total cost of this counter storage project would be in the range of \$45 million, plus the temporary environmental disruption in active construction areas, and the permanent environmental impact of new rights-of-way required for the project facilities.

94. Under the second counter storage alternative, Columbia would have to drill new low-pressure "counter storage" wells at the perimeter of the current boundary to serve as low-pressure withdrawal-only wells to counteract the effect of the Interden production wells drawing on Columbia's higher-pressure injection wells. This option would leave existing injection/withdrawal wells in their current mode and preserve storage capacity. However, as in the first counter storage alternative, a separate low-pressure gathering

system would be required to connect these wells to a low-pressure pipeline to allow these wells to operate continuously in a withdrawal mode. Columbia projects that a minimum of 10 wells would be required to implement this option. Columbia estimates that the cost of drilling these 10 wells would be about \$6 million based on current drilling costs. An average of one and one-half miles per well of gathering line would be required to connect these wells to a central point, at an estimated construction cost of \$15 million. The total cost of this alternative, though, would be \$41 million, since the eight miles of facilities to connect to an existing low-pressure line located in the Mohican Forest that would be required for the above-discussed alternative, at a cost of \$20 million, would also be necessary for this option.

95. While this second option avoids the need to replace storage capacity, it adds the additional construction disturbance of 10 new well sites near the town of Butler, resulting in 80 to 100 acres of disturbance, impacts to additional landowners, unknown environmental impacts, and future maintenance of the 10 new well locations, in addition to the environmental disturbance to the Mohican Forest.

96. In the third alternative, Columbia looked at taking the west side of the Weaver storage field out of injection service. As stated above, deactivation of this portion of the field would require replacement of 11.8 MMcf/day of deliverability and 907 MMcf of storage capacity, and Columbia does not have latent storage capacity to offset such a loss. Thus, detailed studies would also have to be made under this option to determine where new storage could be built to replace the lost deliverability and capacity.

97. This deactivation option is similar to the conversion of storage wells under the first counter storage alternative, except that after injections are halted in these 13 western injection/withdrawal wells, the wells are not put on permanent withdrawal. While this would save the cost and construction disruption of building a new low-pressure withdrawal-only pipeline system, it would not address the continuing loss of storage gas to production wells adjacent to the storage field. Thus, storage gas would continue to be drawn toward the production wells, albeit at a slower rate due to the cessation of high-pressure injections in the immediate area.

98. Finally, Columbia examined purchasing all production wells and production rights in the affected area so as to be in complete control of any and all well activity in the storage field area. There are perhaps 10 current production wells within the area of the proposed boundary change that would need to be purchased. In addition, it would be necessary for Columbia to acquire production acreage within the 3,000 acre area of the proposed storage field boundary extension. Columbia states that acquiring these assets would burden it with property and mineral rights ownership that are not needed and not part of its primary storage business. Moreover, without any guarantee of complete participation in the purchase program by current producers and mineral owners,

Columbia believes this option would not afford it a complete solution to the principle issue of foreign wells accessing the active storage formation because any missing portions of the buffer could be developed by an outside operator, negating any attempt to create a buffer between Columbia's storage field and surrounding production fields.

99. Thus, aside from the fact that Columbia has not proposed any of the above-discussed alternatives, there are economic and/or environmental burdens associated with the alternatives.<sup>102</sup> In contrast, Columbia's plan is to acquire from landowners and mineral owners only the rights needed to ensure the integrity of its existing storage operations. Existing producer-owned wells operating within the boundary would be free to use and develop any formation except the Clinton formation, since there is no evidence of communication between the Clinton formation and other formations. All affected landowners and mineral rights owners would be offered a storage lease or easement as were the other lessors of 40,000 acres of leases and easements presently in effect for the Weaver storage field. The Commission agrees with Columbia that this targeted acquisition of only those rights necessary to conduct storage operations is the most balanced way to accommodate storage and production operations. Further, the proposal before us has no environmental impacts.

100. In conclusion, Columbia proposed reservoir boundary is reasonable because it includes an area only where gas is known to have migrated. The buffer zone is reasonable because it extends beyond the area where the storage formation is known to exist, and provides a cushion of distance to where geologic data indicates the storage formation has discontinued. The alternatives are costly, will have adverse impacts on the environment, and in some cases will not provide an ultimate solution to Columbia's problem.

## **V. Environmental Analysis**

101. OPORR requests that a complete environmental impact statement (EIS) be prepared for Columbia's project. An EIS is required only when the proposed project is a major federal action significantly affecting the quality of the human environment. This project is merely expanding the storage field boundaries to reflect the existing location of

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<sup>102</sup> See July 25, 2008 Data Response of Columbia, Data Request No. 2. In addition, Columbia did not fail to consider field pressure controls as an alternative, as alleged by Interden. Columbia's counter storage alternatives one and two and the deactivation/depressurization alternative are forms of field pressure controls.

the storage field and storage gas.<sup>103</sup> The project does not involve any construction of facilities, ground disturbance, abandonment, or other activity that could result in environmental impacts, i.e., impacts on water resources, wildlife, or noise or air quality. Further, pursuant to section 380.4(a)(27) of the Commission's regulations implementing NEPA, this action is categorically excluded from the requirements to prepare an EIS because the proposal does not involve the construction of any facilities.<sup>104</sup>

102. Several parties contend that Columbia's proposal here is associated with Columbia's Ohio Storage Project in Docket No. CP08-431-000 to construct facilities to expand the Weaver and Crawford storage fields and that the proposal in this proceeding therefore will, in fact, impact the environment. In the Ohio Storage Project proceeding in Docket No. CP08-431-000, the Commission authorized Columbia to construct facilities to initiate a continually operating, withdrawal-only, i.e., counter-storage, system to address a potential gas migration problem in the eastern portion of the field.<sup>105</sup> These certificated Weaver field facilities will also allow Columbia to increase the operating pressure in portions of the field, which will accommodate a 3.7 Bcf increase in working gas capacity and an additional 103,400 Dth per design day of storage deliverability at the Weaver storage field. Because Columbia's Ohio Storage Project proposed the construction of facilities, the Commission prepared an environmental assessment (EA) for that project. Any environmental comments regarding the facilities proposed in that project were addressed in the EA and in the Commission's certificate order in that proceeding.

103. As Columbia has explained, although both projects involve the Weaver storage field, there is no relationship between Columbia's proposal here and its expansion project in Docket No. CP08-431-000.<sup>106</sup> The proposal in this case is to extend the storage field

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<sup>103</sup> As noted above, Columbia's application in this case proposes no changes to the currently certificated capacity of the Weaver storage field.

<sup>104</sup> 18 C.F.R. § 380.4(a)(27) (2008).

<sup>105</sup> See *Columbia Gas Transmission Corp.*, 126 FERC ¶ 61,237 (2009). Specifically, the Commission authorized Columbia to install 4.1 miles of storage pipeline, abandon and replace approximately 1.7 miles of pipeline, install additional metering and regulation stations, and recondition 21 existing wells.

<sup>106</sup> See Columbia's July 25, 2008 Data Response, Response No. 3 (explaining the differences between the two projects and including a chart setting forth a factual comparison of the projects).

boundaries on the western side of the storage field to address storage gas migration. In the Ohio Storage Project, Columbia was authorized to construct facilities to expand the capacity of the eastern side of the storage field and to address potential problems regarding migration on the eastern portion of the storage field. Those facilities will also allow Columbia to bring back to active storage operation a portion of the eastern part of the field that was either inactive or less effective without endangering the integrity of the entire field. A project to *extend* storage field *boundaries*, as here, is different than one to *expand* the *capacity* of a storage field. Columbia also states that it operates the eastern side of the Weaver storage field in a significantly different manner than it operates the western side of the same field, further indicating that the two projects are independent and unrelated.

104. Moreover, Mr. Beach and Ms. Dearth intervened in Docket No. CP08-431-000, questioning the relationship between the Ohio Storage Project and Columbia's proposal in this case. In its March 19, 2009 order, the Commission found that "the enhancement of the facilities proposed in this proceeding does not affect the western edge of the storage field," and that "the project proposed herein is independent of the project in Docket No. CP08-78-000."<sup>107</sup>

105. Finally, OPORR and Mr. Pugh raise environmental issues related to the existence of the Weaver storage field.<sup>108</sup> For example, OPORR notes concerns regarding the safety of having a high-pressure gas storage field beneath the Village of Butler and potential methane contamination of the Muskingum Watershed Conservancy District, an underground aquifer above the storage field. Mr. Pugh raises the potential for the chemical contamination of local water supplies from the hydraulic fracturing of wells and adverse impacts to plants and animals. This project merely extends the storage field boundaries to reflect the location of the storage field and storage gas. The authorization granted herein will have no impact on the safety of the Weaver storage field, the potential for water contamination, or on other natural resources.

106. The Commission on its own motion received and made part of the record in this proceeding all evidence, including the application and exhibits thereto, submitted in support of the authorization sought herein, and upon consideration of the record,

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<sup>107</sup> 126 FERC ¶ 61,237 at P 67.

<sup>108</sup> See August 28, 2008 and June 9, 2009 comments of OPORR. See also, May 26, 2009 and June 10, 2009 comments of Mr. Pugh.

The Commission orders:

(A) Columbia is granted a certificate of public convenience and necessity to extend the storage reservoir and protective boundaries of its Weaver storage field in Richland County, Ohio to encompass approximately 3,000 additional acres, as described in the application and this order.

(B) The certificate granted by Ordering Paragraph (A) is subject to Columbia's compliance with section 157.20(a) and (e) of the Commission's Regulations.

(C) A presumption is granted that Columbia may roll the reasonable project costs into its system-wide rates in a future rate case, absent a material change in circumstances, as discussed in the body of this order.

(D) The untimely motions to intervene are granted.

(E) The requests for an evidentiary hearing are denied.

By the Commission.

( S E A L )

Kimberly D. Bose,  
Secretary.