

160 FERC ¶ 61,107
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Neil Chatterjee, Chairman;
Cheryl A. LaFleur, and Robert F. Powelson.

Tres Palacios Gas Storage LLC

Docket No. CP16-145-000

ORDER GRANTING IN PART AND DENYING IN PART ABANDONMENT

(Issued September 21, 2017)

1. On April 7, 2016, Tres Palacios Gas Storage LLC (Tres Palacios) filed an application pursuant to section 7(b) of the Natural Gas Act (NGA)¹ to abandon 7.41 billion cubic feet (Bcf) of working gas capacity at Tres Palacios's salt dome natural gas storage facility located in Matagorda, Colorado, and Wharton Counties, Texas. Tres Palacios also requests to lower the certificated base gas capacity at its facility by 3.35 Bcf. As discussed in this order, the Commission grants in part and denies in part Tres Palacios's requested authorization.

I. Background and Proposal

2. Tres Palacios,² a Delaware limited liability company with its principal place of business in Houston, Texas, is a natural gas company³ and the owner and operator of the Tres Palacios Gas Storage Facility located in Matagorda, Colorado and Wharton Counties, Texas.

¹ 15 U.S.C. § 717f(b) (2012).

² Tres Palacios is a wholly owned subsidiary of Tres Palacios Holdings LLC, a joint venture between Crestwood Equity Partners LP and Brookfield Infrastructure Fund II. Crestwood Equity Partners LP is affiliated with Stagecoach Pipeline and Storage Company LLC (f/k/a Central New York Oil and Gas Company, LLC) and Arlington Storage Company, LLC, two FERC-jurisdictional storage companies.

³ 15 U.S.C. § 717a(6) (2012).

3. In 2007, the Commission authorized Tres Palacios to construct and operate a three-cavern underground natural gas storage facility with a total certificated capacity of 53.99 Bcf, consisting of 36.04 Bcf of working gas and 17.95 Bcf of base gas, and approved Tres Palacios's proposal to charge market-based rates for its storage services.⁴ In 2010, the Commission granted Tres Palacios's request to amend this authorization to increase the certificated total, working, and base gas capacities of each cavern, as determined by sonar surveys⁵ that were conducted in 2009 prior to the caverns being placed in natural gas storage service.⁶ As a result, Tres Palacios's total certificated capacity is 57.26 Bcf, consisting of 38.4 Bcf of working gas and 18.86 Bcf of base gas.

4. As shown in Table 1, Tres Palacios now seeks to amend its certificated total, working, and base gas capacities of each of its three caverns. Tres Palacios does not propose to amend the maximum pressure gradient, maximum pressure at the casing shoe,⁷ or minimum pressure gradient at the casing shoe.

Cavern		Current Certificated Capacity	Proposed Certificated Capacity	Change
1	Working Gas, Bcf	12.68	10.62	-2.06
	Base Gas, Bcf	6.77	5.68	-1.09
	Cavern Total, Bcf	19.45	16.30	-3.15
2	Working Gas, Bcf	14.37	12.89	-1.48
	Base Gas, Bcf	7.87	7.05	-0.82

⁴ *Tres Palacios Gas Storage, LLC*, 120 FERC ¶ 61,253 (2007) (Certificate Order).

⁵ A sonar survey is done to determine the exact dimensions of a salt-dome natural gas storage cavern.

⁶ *Tres Palacios Gas Storage LLC*, 133 FERC ¶ 62,244 (2010) (Amendment Order).

⁷ The casing shoe is a piece of equipment welded onto the bottom joint of a casing that represents the location of the bottom of the casing and facilitates the lowering of the casing into the wellbore.

	Cavern Total, Bcf	22.24	19.93	-2.31
3	Working Gas, Bcf	11.35	7.48	-3.87
	Base Gas, Bcf	4.22	2.78	-1.44
	Cavern Total	15.57	10.27	-5.30

5. Tres Palacios states that the proposed capacities are based on volume verification studies performed in 2015 by PB Energy Storage Services, Inc. (PB-ESS Reports), which demonstrate that the capacity for each of its three storage caverns is lower than the certificated capacity. Specifically, the PB-ESS Reports calculate the dewatered volumes of each cavern based on two pressure/temperature logs at different cavern gas inventories. Using this information, and the temperature, maximum pressure, and minimum pressure, the PB-ESS reports calculated new certificated total, working, and base gas capacities. Tres Palacios further notes that the capacities calculated in the PB-ESS Reports are consistent with inventory and pressure data observed in the caverns.

6. Tres Palacios avers that the lower cavern volumes are the result of better information regarding the actual dewatered volume of the caverns and natural salt creep. Specifically, Tres Palacios asserts that the 2010 Amendment Order was based on information available at the time, including the 2009 sonar surveys of the three caverns, and assumptions regarding the dewatered volume of the cavern after initial development.⁸

7. Tres Palacios states that the proposed working gas capacity is greater than Tres Palacios's current contractual commitments. Accordingly, current storage customers will not be impacted by the proposed amendment.

II. Procedural Issues

A. Notice, Interventions, Protests, and Answers

8. Notice of Tres Palacios's application was issued by the Commission on April 20, 2016, and published in the *Federal Register* on April 26, 2016 (81 Fed. Reg. 24,593).

⁸ The 2009 sonar surveys were conducted while the storage caverns were still filled with brine. Therefore, Tres Palacios's existing certificated capacity includes an assumption of how much brine could be removed from the caverns.

Timely, unopposed motions to intervene were filed by NJR Energy Services Company, Riverway Storage Holdings (Riverway), and Underground Services Markham, LLC (Markham).⁹

9. Markham¹⁰ and Riverway¹¹ filed protests to Tres Palacios's application. On May 4, 2016, Tres Palacios filed a motion for leave to answer and an answer to the protests. On May 11, 2016, Markham and Riverway filed additional protests and comments. Tres Palacios filed an answer on May 26, 2016. Markham and Riverway filed answers to Tres Palacios's answer on June 16 and June 30, 2016, respectively. On July 1 and July 15, 2016, Tres Palacios filed answers to the answers filed by Markham and Riverway. Markham filed an additional answer on July 27, 2016. On March 3, 2017, Markham filed a motion to dismiss the application or, in the alternative, require further information. Tres Palacios filed an answer to the motion on March 20, 2017, which was answered by Markham on April 14, 2017. Although the Commission's Rules of Practice and Procedure generally do not permit answers to protests or answers to answers,¹² our rules also provide that we may, for good cause, waive this provision.¹³ We will accept all the responsive pleadings filed in this proceeding because they have provided information that assisted us in our decision-making process.

⁹ Timely, unopposed motions to intervene are granted by operation of Rule 214(c) of the Commission's Rules of Practice and Procedure. 18 C.F.R. § 385.214(c) (2017).

¹⁰ Markham is the leaseholder of the property where Tres Palacios's salt caverns and certain related facilities are located. Under the terms of the lease agreement between Markham and Tres Palacios, Tres Palacios is required to make an annual lease payment to Markham based on the certificated working gas capacity of each of its caverns.

¹¹ Riverway was an essential participant in the development of the Tres Palacios facilities. Riverway and Markham have entered into an agreement that, among other terms, requires Markham to direct Tres Palacios to pay Riverway for its contributions to the development of the Tres Palacios facilities. Those payments to Riverway are based, in part, upon the certificated working gas capacity of the Tres Palacios facilities.

¹² 18 C.F.R. § 385.213(a)(2) (2017).

¹³ 18 C.F.R. § 385.101(e) (2017).

10. In their filings, Markham and Riverway raise a number of procedural and substantive issues including: (1) Tres Palacios's failure to demonstrate that the proposal will not adversely affect cavern integrity; (2) Tres Palacios's failure to comply with its current certificate conditions; and (3) the adequacy of the environmental review.

B. Request for Hearing or Technical Conference

11. Markham and Riverway oppose Tres Palacios's request for shortened procedures pursuant to Rules 801 and 802 of the Commission's Rules of Practice and Procedure,¹⁴ stating that the complex and technical information submitted in this proceeding must be reviewed by technical experts and Commission staff. In the alternative, Markham requests a technical conference. Tres Palacios argues that a trial-type hearing is not necessary in this proceeding because any material issues of fact can be resolved on the basis of a written record and the Commission regularly resolves complex certificate proceedings without a hearing.

12. 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, trial-type hearings.¹⁵ An evidentiary trial-type hearing is necessary only when there are material issues of fact in dispute that cannot be resolved on the basis of the written record.¹⁶ The issues raised by Markham and Riverway in this proceeding have been adequately argued, and a determination can be made on the basis of the existing record in this proceeding. All interested parties have been afforded a full and complete opportunity to present their views to the Commission through numerous written submissions. We find that there is no material issue of fact that we cannot resolve on the basis of the written record in the proceeding. Therefore, we will deny the request for a formal, trial-type hearing.

13. Additionally, because we find that all the issues raised by Markham and Riverway can be resolved on the basis of the written record, we find that there is no need for a technical conference and deny Markham's request.¹⁷

¹⁴ 18 C.F.R. §§ 385.801 and 385.802 (2017).

¹⁵ *Dominion Transmission, Inc.*, 141 FERC ¶ 61,240, at P 25 (2012).

¹⁶ See, e.g., *Moreau v. FERC*, 982 F.2d 556, 568 (D.C. Cir. 1993); *Southern Union Gas Co. v. FERC*, 840 F.2d 964, 970 (1988); *Dominion Transmission, Inc.*, 141 FERC ¶ 61,183, at P 15 (2012).

¹⁷ See *MoGas Pipeline LLC*, 155 FERC ¶ 61,221, at P 18 (2016).

C. Request for Additional Notice and Comment Period

14. Markham argues that by filing the results of a 2016 sonar survey on Cavern 3 in its May 26, 2016 Answer, Tres Palacios submitted substantial new information into the record and the Commission should treat this submission as an amendment to its application and provide a new notice and comment period.

15. The Commission routinely accepts additional information into the record to assist in its analysis. This information is generally in response to a request by Commission staff, but an applicant may also supplement the record on its own. In determining if a submission constitutes an amendment to a proposal, which would require an additional notice and comment period, the Commission examines a variety of factors, the primary factor being whether the submission changes the original proposal. Here, Tres Palacios submitted the results of a sonar survey to further support its original proposal and did not request to change any parameter of the original proposal. Moreover, the Commission has accepted into the record multiple submissions by Markham and Riverway responding directly to the results of the sonar survey. Therefore, we find that Tres Palacios's May 26, 2016 submission was not an amendment to its original proposal and does not require an additional notice and comment period.

D. Request to Consolidate Proceedings

16. Markham and Riverway request that this proceeding be consolidated with the proceedings in Docket Nos. CP07-90-000, CP10-499-000, and CP14-127-001.¹⁸ In its answer, Tres Palacios argues that consolidation is not appropriate because the issue in this proceeding, whether the volume of Tres Palacios's storage caverns is less than previously certificated, is distinct from the other cited proceedings. In response, Markham notes that the information required by Tres Palacios's certificate conditions will help assess any physical changes in the cavern size; thus, consolidation with the original certificate proceeding is appropriate.

17. As the Commission stated in its October 28, 2016 Order Denying Clarification, the records in Docket Nos. CP07-90, CP10-499, and CP14-127 are closed¹⁹ and we again deny consolidation. Markham's concerns regarding the criteria applicable to altering the certificated parameters of a storage facility, including Tres Palacios's request to alter its engineering conditions, can be resolved in this current proceeding and Markham's and Riverway's concerns are addressed fully below.

¹⁸ In its May 2, 2016 Answer, Riverway supports Markham's request to consolidate these proceedings.

¹⁹ *Tres Palacios Gas Storage, LLC*, 157 FERC ¶ 61,066, at P 6 (2016).

E. Critical Energy Infrastructure Information

18. Riverway argues that Tres Palacios improperly designated certain information in its application as Critical Energy Infrastructure Information (CEII) and that this over-designation has hindered Riverway's review of the application. Conversely, Tres Palacios avers that it appropriately designated detailed engineering data as CEII and notes that other storage providers have done the same with similar information. Tres Palacios further states that interveners may request the CEII pursuant to the Commission's regulations and the fact that Riverway has gained access to the information and filed detailed responses to it demonstrates that interveners were not harmed by the designation. In response, Riverway claims that although irrelevant to the determination of whether the information is appropriately CEII, Riverway was hindered and delayed in obtaining experts' opinions.

19. Riverway was not prejudiced by the filing of certain information as CEII. As Tres Palacios notes, and Riverway acknowledges, it has received the CEII information filed in this proceeding and has been able to file extensive comments on that material.²⁰ Moreover, the Commission has accepted all answers filed in this proceeding to date.²¹ Therefore, we find that Riverway's access to CEII has not hindered its review of the proposal.²²

F. Motion to Strike

20. Tres Palacios requests that the Commission strike, or in the alternative give no weight to, the statements of Mr. Joel Nieland and Mr. Joel Warneke, which were submitted with Markham's June 16, 2016 Answer.²³ Tres Palacios contends that Markham provided no verification for the statements and did not lay a proper foundation for the opinions expressed. Markham contends that Tres Palacios seeks to hold Markham's expert analysis to a higher standard than the analyses and statement

²⁰ "Due process requires only a 'meaningful opportunity' to challenge new evidence." *Myersville Citizens for a Rural Community, Inc. v. FERC*, 783 F.3d 1301, 1327 (D.C. Cir. 2015) (citation omitted).

²¹ The last answer filed in the proceeding was on April 14, 2017.

²² With respect to Riverway's claim that other parties may have been hindered in their review of the application, we note that no other party has made such a claim and that the only other intervener to file comments on the CEII information has not alleged that its review was affected.

²³ See Markham's June 16, 2016 Answer at Attachments A and B.

submitted by Tres Palacios. Markham argues that Tres Palacios confuses the standards for submission in an evidentiary hearing versus submissions in the paper hearing currently being conducted and notes that it has requested a hearing where Tres Palacios could challenge the verifications and foundations of Markham's expert witnesses.

21. Motions to strike are generally disfavored by the Commission and testimony should not be stricken unless the content has "no possible relationship to the controversy, may confuse the issues, or otherwise prejudice a party."²⁴ Here, the statements from Mr. Nieland and Mr. Warneke bear directly on the issues in this proceeding. Moreover, Tres Palacios has not been prejudiced by the statements because it has had multiple opportunities to respond to their substance.²⁵ Therefore, we will deny Tres Palacios's motion to strike.

III. Discussion

22. Because Tres Palacios seeks authority to alter the operating parameters of its interstate natural gas storage facility subject to the Commission's jurisdiction, the proposal is subject to the requirements of the NGA.

A. Abandonment

23. Markham and Tres Palacios disagree about the statutory provision applicable to Tres Palacios's application. Markham states that because Tres Palacios seeks to permanently reduce its working gas capacity, the Commission should analyze the application as a request for abandonment pursuant to section 7(b) of the NGA. Tres Palacios avers that it appropriately sought to amend its certificate under section 7(c) of the NGA because the Commission regularly allows storage operators to restate their actual capacity through amendments rather than abandonments.

24. Section 7(b) of the NGA prevents a natural gas company from abandoning "any portion of its facilities ... or any services rendered [from those] facilities without the permission and approval from the Commission"²⁶ Here, Tres Palacios seeks to permanently reduce the level of certificated working gas capacity of its storage facility,

²⁴ *San Diego Gas & Elec. Co. v. Sellers of Energy and Ancillary Servs.*, 114 FERC ¶ 61,070, at P 20 (2006).

²⁵ Since the filing of the statements by Mr. Nieland and Mr. Warneke, Tres Palacios has submitted three answers, all of which have been accepted into the record.

²⁶ 15 U.S.C. § 717f(b) (2012).

and thus, reduce level of service offered from its jurisdictional storage facility. Therefore, we will analyze Tres Palacios's request under section 7(b) of the NGA.

25. Section 7(b) allows an interstate pipeline company to abandon jurisdictional facilities or services only if the abandonment is permitted by the "present or future public convenience or necessity."²⁷ The applicant has the burden of providing evidence to show that the abandonment is permitted under this standard. The Commission has stated that continuity and stability of existing service are the primary considerations in assessing the public convenience or necessity of a permanent cessation of service under section 7(b) of the NGA.²⁸

26. Commission policy also requires storage companies to obtain prior approval from the Commission before making changes to the operational parameters of their storage facilities.²⁹ When analyzing proposed changes to operating parameters, the Commission's concern is the integrity of storage caverns (or reservoirs or formations).³⁰ A storage provider is not required to present evidence of structural changes to its storage facility in order to request authorization to change the certificated working gas capacity, or any other design parameter, so long as it shows that doing so would not adversely impact the structural integrity of its storage facility.³¹

1. Effects to Existing Customers

27. As stated above, continuity and stability of existing service are the primary considerations in assessing the public convenience or necessity of a permanent cessation of service under section 7(b) of the NGA. Here, Tres Palacios has stated that its proposed working gas capacity is still greater than Tres Palacios's current contractual

²⁷ *Id.* See also *El Paso Natural Gas Co.*, 135 FERC ¶ 61,079, at P 17 (2011).

²⁸ See *Tallgrass Interstate Gas Transmission, LLC*, 144 FERC ¶ 61,197, at P 16 (2013); *Southern Natural Gas Co.*, 126 FERC ¶ 61,246, at P 27 (2009).

²⁹ *Tres Palacios Gas Storage, LLC*, 150 FERC ¶ 61,197, at P 14 (2015), *order granting clarification and dismissing reh'g*, 154 FERC ¶ 61,105 (2016), *order denying clarification*, 157 FERC ¶ 61,066 (2016), *order granting clarification*, 157 FERC ¶ 61,139 (2016).

³⁰ *Id.* (citing *Transcontinental Gas Pipe Line Co., LLC*, 142 FERC ¶ 61,095, at P 45 (2013)).

³¹ *Tres Palacios Gas Storage, LLC*, 157 FERC ¶ 61,066, at P 9 (2016).

commitments. Furthermore, no customer has filed adverse comments to the proposal. Therefore, we find that the proposal will not result in the loss of service to any current customers.

2. Effects to Cavern Integrity

28. In support of its application, Tres Palacios submitted the PB-ESS Reports on each of its three caverns, a sonar survey for Cavern 3 conducted in 2016, results of other tests performed on the caverns, and operating data. The PB-ESS Reports calculate cavern capacity using a finite element analysis – a calculation using temperature and pressure data, an assumed cavern shape, and gas injection data. Tres Palacios claims that the PB-ESS Reports demonstrate that the caverns are not capable of storing any additional gas beyond the calculated capacities. Tres Palacios cites various reasons for the reduced capacity in the caverns, including salt creep and the inability to fully dewater the caverns after they initially went into service.

a. Markham's and Riverway's Protests and Answers

29. Riverway asserts that in only limited circumstances has the Commission allowed a salt-cavern storage operator to change their certificated parameters without a sonar survey³² and argues the circumstances present in that case, the presence of bedded salt³³ and a detailed cavern monitoring plan, are not applicable here. Riverway, therefore, concludes that the Commission should not approve Tres Palacios's application absent a sonar survey on all three caverns.

30. Next, Markham and Riverway argue that the PB-ESS Reports are unreliable because they are subject to substantial uncertainty and based on unverified assumptions. For example, Riverway states that the PB-ESS Reports rely on an assumption that cavern geometry has not changed since 2009, but the 2016 sonar survey on Cavern 3 shows that not to be case. Markham and Riverway state that a secondary verification method, specifically a sonar survey, is needed for all three caverns. Markham and Riverway further note that Tres Palacios's own data demonstrate that the amount of gas recently stored in Cavern 3 exceeds the capacity proposed by Tres Palacios.

³² Riverway's May 11, 2016 Answer at 6-10 (citing *Saltville Gas Storage Co.*, 122 FERC ¶ 61,151 (2008) (*Saltville*)).

³³ Bedded salt is a salt formation in which the original depositional structure of alternating salt and non-salt beds is largely preserved.

31. Markham and Riverway also contend that the PB-ESS Reports fail to demonstrate the cause of the alleged cavern closure and urge the Commission to investigate whether Tres Palacios's operations have led to the reduction in cavern capacity. Markham states that Tres Palacios has not operated its caverns as it originally intended, noting that Tres Palacios has not cycled its gas seven times per year.³⁴ Markham also notes that the data submitted by Tres Palacios indicates that the caverns were operated at very low pressures, sometimes below the minimum pressure for the caverns,³⁵ for extended periods of time. Markham avers that cavern cycling is important to maintain integrity and minimum pressures are necessary to support a cavern's roof and walls, and recommends that geomechanical simulations be conducted to determine the effect of sustained low pressure on the caverns.³⁶

32. Markham further contends that Tres Palacios's statements in a 2013 abandonment proceeding directly contradict its current claims. Markham notes that in that proceeding Tres Palacios asserted that the caverns have not experienced operational issues, Tres Palacios could restore abandoned capacity at any time, and that the caverns would not be permanently modified. Markham claims a significant event must have occurred between the 2013 proceeding and Tres Palacios's filing of this proposal to justify such a change in position.

³⁴ Markham further states that the number of cycles per year is a "less than perfect way" to ensure cavern integrity and urges the Commission to consider alternative operating parameters such as a minimum percentage of time the caverns must be at maximum pressure and a maximum percentage of time the caverns can be at minimum pressure.

³⁵ Markham asserts that the Certificate Order contains an inadvertent error regarding the minimum pressure gradient. Markham notes that Tres Palacios's application proposed a minimum pressure gradients of 0.25 psi per foot for Caverns 1 and 2 and 0.20 psi per foot for Cavern 3. However, the Commission's engineering conditions stated that the pressure gradient was 0.20 psi per foot for all 3 caverns. Markham notes that Tres Palacios has reiterated these pressure gradients in subsequent filings, such as when calculating the minimum pressures and base gas requirements in its 2010 amendment. Markham states that if Tres Palacios now proposes to lower the pressure gradient for Caverns 1 and 2, it must provide a justification to do so and show that there will be no effects on cavern integrity.

³⁶ Markham's March 3, 2017 Answer (*citing* Ralph Cole, "The Long Term Effects of High Pressure Natural Gas Storage on Salt Caverns," Solution Mining Research Institute (2002) at 1-2 (Cole Study) and American Petroleum Institute, Recommended Practice 1170, *Design and Operation of Solution-mined Salt Caverns Used for Natural Gas Storage*, First Ed. (July 2015) (API-1170)).

33. Next, Markham argues that the salt creep rates calculated by Tres Palacios is an oversimplified annual average and that to the extent that salt creep information was provided, no back-up support for the information was included. Markham asserts that the cavern closure rates, after adjusting for the time that the caverns were brine filled, being dewatered, and operating at maximum pressure, are very high and raise questions regarding the integrity of the caverns. Markham states that Tres Palacios has not answered how much base gas is required to maintain cavern integrity or what the salt creep rate of the caverns would be at the current minimum pressure.

34. With respect to Tres Palacios's claim that there is more brine in the caverns than initially assumed, Markham and Riverway assert that more information is needed. Markham states that a sonar survey can provide definitive information concerning the location of the gas-brine interface and the extent of cavern closure. Markham notes that for the first time in this proceeding Tres Palacios alleges that the dewatered volumes assumed in 2010 were not accurate despite Tres Palacios having an opportunity to inform the Commission of such information through its semiannual filings and the 2013 abandonment application.

35. Markham avers that the Commission should not allow a reduction in capacity due to a failure to fully dewater the caverns. Markham contends that Tres Palacios's decision to stop dewatering was an economic decision and as a market-based rates storage provider, Tres Palacios should assume the economic risk associated with failing to fully dewater the caverns.

36. Next, Markham and Riverway assert that the 2016 sonar survey on Cavern 3 suggests that spalling has occurred.³⁷ Markham states that because salt creep would affect all sides of the cavern equally, the large increase in cavern floor height without a corresponding decrease in diameter at the bottom of the cavern is evidence of spalling. In light of this finding, Markham argues a geomechanical analysis must be conducted in order to determine the operating parameters needed protect cavern integrity. Additionally, Markham and Riverway state that this underscores the need for sonar surveys on Caverns 1 and 2 to determine what changes to those caverns have occurred and whether additional engineering conditions are required. Markham further notes that because the caverns have been operated at different pressures, it is not accurate to assume that the same effects have occurred on Caverns 1 and 2. Markham states that Tres Palacios must explain how its cavern operation, including operating at low pressures, may have contributed to the spalling.

³⁷ "Spalling" occurs when salt falls from the top or sides of a salt cavern due to flaws or heterogeneities in the salt structure, "skin" damage, or improper solution mining techniques.

37. With respect to the results of the mechanical integrity tests submitted by Tres Palacios, Markham argues that they cannot be relied upon. Markham notes that the mechanical integrity tests assume a cavern volume based on the 2009 sonar surveys that even Tres Palacios acknowledges is not accurate.

38. In conclusion, Markham and Riverway state that Tres Palacios has submitted insufficient information to determine whether the new operating parameters would adversely affect cavern integrity and if additional changes to Tres Palacios's operating parameters are needed to ensure cavern integrity going forward.

b. Tres Palacios's Answers

39. Tres Palacios asserts that the Commission has previously relied on calculations similar to those done in the PB-ESS Reports to determine cavern capacity and that the PB-ESS Reports are more detailed than what the Commission relied upon in *Saltville*.³⁸ Tres Palacios contends that Riverway overstates the margin of error associated with the finite element analysis because Riverway relies on an older methodology and its own faulty assumptions.

40. Tres Palacios also states that the sonar survey conducted on Cavern 3 in 2016 demonstrates that the calculations of cavern capacity in the PB-ESS Reports are accurate. Specifically, Tres Palacios notes that the calculations for the dewatered volume of the cavern were within 2.5 percent of the volume determined in the sonar survey, which are well within the margin of error. Tres Palacios contends that the Commission should rely on the PB-ESS Reports for Caverns 1 and 2 because the calculations were verified by the sonar survey on Cavern 3. Moreover, Tres Palacios notes that the operating data cited by Riverway shows that the calculated capacity was only 3.4 percent lower than the actual amount of gas in storage, further supporting the accuracy of the calculations. Tres Palacios notes that operating data further support the PB-ESS Reports because at maximum pressure, the caverns have not been able to achieve the maximum certificated capacities.

41. Tres Palacios next argues that Riverway mischaracterizes the 2016 sonar survey. Tres Palacios asserts that the sonar survey demonstrates that the portion of the cavern used for gas storage has not undergone a material geometric change. Rather, the primary

³⁸ Tres Palacios's May 26, 2016 Answer at 2-3 (citing *Saltville*, 122 FERC ¶ 61,151 (2008)).

change to the cavern is an increase in the cavern floor due primarily to salt creep. Therefore, the PB-ESS Report's assumptions regarding cavern geometry are appropriate.³⁹

42. Tres Palacios also asserts that concerns regarding cavern cycling are misplaced. Tres Palacios states that although the facility is designed for seven cycles per year, it is not necessary to cycle that frequently. Tres Palacios notes that the Cole Study finds that cycling may create operational problems, such as salt sluffing and cavern closure, and therefore, not cycling for the sake of cycling is consistent with its findings. Tres Palacios asserts that the operating data submitted demonstrate that it has not operated its caverns below the minimum pressure gradient of 0.20 psi per foot, as required by Engineering Condition 7(b) of its original certificate.⁴⁰

43. Additionally, Tres Palacios avers that Markham mischaracterizes its previous statements from the 2013 abandonment proceeding, and that those statements were merely meant to reflect the fact that Tres Palacios was not planning to alter its certificated pressures or abandon any physical facilities.

44. Next, Tres Palacios asserts that the levels of salt creep experienced in its caverns, as calculated by the PB-ESS Reports, are consistent with the geomechanical testing previously done on Cavern 1 and other similarly operated salt dome storage caverns. Tres Palacios notes that the currently certificated capacities are based on an assumed level of dewatering that was not actually achieved⁴¹ and that much of the reduction in capacity, particularly in Cavern 3, is attributable to brine occupying the cavern.⁴²

³⁹ Tres Palacios notes that the exact height of the cavern floor is irrelevant to the calculations in the PB-ESS Reports because the gas-brine interface height determines the bottom of the cavern that is suitable for storage.

⁴⁰ With respect to maximum pressure, Tres Palacios acknowledges that the maximum pressure was exceeded briefly after dewatering and during the initial shut-in. Tres Palacios attributes this to an increase in temperature in the cavern, which led to a pressure increase. Tres Palacios states that the only other occurrence where maximum pressure appears to be exceeded is within the margin of error for cavern capacity and inventory.

⁴¹ Tres Palacios notes that the 2009 sonar surveys were conducted while the caverns were still filled with brine and therefore, the dewatered volume was not known.

⁴² Tres Palacios notes that this is verified by the 2016 sonar survey on Cavern 3.

45. Tres Palacios notes that the 2016 sonar survey on Cavern 3 supports its conclusion that a significant portion of the cavern is filled with brine. Tres Palacios asserts that the amount of dewatering that occurred in its caverns was a function of gas pressure, not economic considerations as alleged by Markham. Tres Palacios states that it dewatered its caverns by replacing brine with gas and once the maximum pressure in the cavern was reached, no further dewatering could have occurred. Tres Palacios notes that the Commission has recognized this method of dewatering in *East Cheyenne Gas Storage, LLC*, where the Commission allowed an increase in maximum pressure to allow for additional dewatering.⁴³

46. Although initially asserting that the 2016 sonar survey on Cavern 3 shows no signs of spalling, Tres Palacios, in its December 21, 2016 data response, states that a limited amount of spalling is occurring in the lower portion of the cavern.⁴⁴ However, Tres Palacios avers that it is natural to have some spalling near the bottom of caverns, particularly caverns that are tall and deep like Cavern 3, and that the spalling poses no risk to cavern integrity.⁴⁵ Tres Palacios states that it will mitigate the risk of future spalling by keeping the cavern pressures as high as possible.

47. In conclusion, Tres Palacios states that it has provided the Commission with sufficient information to conclude that the actual capacity of the caverns is less than what is currently certificated, and therefore, the proposal should be approved.

c. Commission Determination

48. The Commission's primary concern in evaluating Tres Palacios's proposal is the effect of the proposal on cavern integrity. We disagree with Markham's assertion that the capacity of a cavern must be based on the fully dewatered cavern volume and that economic considerations cannot be a factor in determining cavern capacity. As we stated in our 2016 order, a storage provider is not required to present evidence of structural changes to its storage facility in order to request authorization to change the certificated working gas capacity, or any other design parameter, so long as it shows that doing so

⁴³ *East Cheyenne Gas Storage, LLC*, 135 FERC ¶ 61,021, at P 26 (2011) (permitting an increase in maximum pressure from 1300 psia to 1900 psia "to adequately dewater all of the zones").

⁴⁴ Tres Palacios's December 21, 2016 Data Response to Data Request No. 11.

⁴⁵ Tres Palacios notes that there is no evidence of spalling near the roof of any of the caverns, which is one area that could cause operational or integrity problems because it might affect the well casing.

would not adversely impact the structural integrity of its storage facility.⁴⁶ Here, Tres Palacios submitted sufficient information for the Commission to evaluate its proposal for Cavern 3. With respect to Caverns 1 and 2, as discussed below, Tres Palacios failed to meet its burden of demonstrating that its proposal will not affect those caverns' integrity.

49. For Cavern 3, Tres Palacios supplemented the PB-ESS analysis with a sonar survey conducted in 2016 and operating data. Independently, as shown in Table 2, the PB-ESS analysis and sonar survey each find that the total capacity of the cavern is currently less than the certificated capacity, and are within 4 percent of each other. Moreover, the 2016 sonar survey demonstrates that the primary cause of the reduction in cavern capacity is the amount of brine that was never dewatered and normal levels of salt creep that have occurred in Cavern 3.⁴⁷

	PB-ESS Analysis (Bcf)	2016 Sonar Survey (Bcf)	Difference (%)
Working Gas	7.48	7.859	5
Base Gas	2.78	2.836	2
Total Capacity	10.27	10.695	4

50. However, as both Markham and Riverway point out, and Tres Palacios now acknowledges, the 2016 sonar survey indicates that spalling has occurred in Cavern 3. Although we agree with Tres Palacios's assertion that to date, the spalling has been minimal and does not presently threaten the integrity of the cavern, additional steps are necessary to monitor the cavern and ensure that more spalling does not occur. Therefore, we will require Tres Palacios to file for approval a spalling monitoring plan for Cavern 3 within 90 days of this order. This plan should include any changes in operating parameters, such as increases in minimum pressure or pressure maintenance plans, which will ensure that further spalling does not occur.

⁴⁶ *Tres Palacios Gas Storage, LLC*, 157 FERC ¶ 61,066, at P 9 (2016).

⁴⁷ Tres Palacios does not seek to lower its minimum pressure gradient in this proceeding, which will ensure that salt creep will not be exacerbated by the proposal.

51. We find that with the inclusion of a spalling monitoring plan discussed above, Tres Palacios has demonstrated that the new proposed operating parameters for Cavern 3 will not affect the cavern's integrity. However, because the sonar survey results are a more accurate measure of cavern capacity compared to the PB-ESS analysis, we approve the lower certificated capacity levels for Cavern 3 based on the sonar survey results.

52. With respect to Caverns 1 and 2, Tres Palacios relies primarily on the PB-ESS Reports and operating data to support its request to reduce the certificated capacity levels. Although those reports may accurately state the caverns' capacities, a sonar survey is needed to determine the effects of the proposal on cavern integrity. Tres Palacios cites only one instance, *Saltville*, where the Commission allowed a change in cavern capacity absent a sonar survey. And in that case, as Riverway notes, a sonar survey would not have effectively measured cavern volume because Saltville's facility contained bedded salt.⁴⁸ Conversely, Tres Palacios's facility is a salt dome storage facility where a sonar survey provides needed information regarding the shape of the cavern, the extent of salt creep, the location of the gas-brine interface, and whether salt spalling has occurred. Although, currently, there is only evidence of spalling in Cavern 3, this is because Tres Palacios failed to conduct sonar surveys on the other two caverns. Tres Palacios states that it will conduct the long overdue sonar surveys on Caverns 1 and 2 in 2017 and 2018.⁴⁹ Should sonar surveys on Caverns 1 and 2 show that spalling has occurred, Tres Palacios must file a spalling monitoring plan for each cavern within 90 days after completion of the sonar survey.

53. Based on the foregoing, Tres Palacios has failed to meet its burden in demonstrating that the reduced certificated capacity for Caverns 1 and 2 will not adversely affect the integrity of those caverns. Therefore, we will grant in part, with respect to the reduction in capacity of Cavern 3, and deny in part, with respect to Tres Palacios's proposal for Caverns 1 and 2.

B. Non-Compliance with Certificate Conditions

54. Markham and Riverway contend that Tres Palacios has failed to comply with multiple Engineering Conditions in the 2007 Certificate Order and that the information which would have been generated by compliance, including from sonar surveys for Caverns 1 and 2, is necessary to evaluate Tres Palacios's proposal. Markham notes

⁴⁸ *Saltville*, 122 FERC ¶ 61,151.

⁴⁹ As discussed below at paragraphs 56 and 57, Tres Palacios is required to conduct sonar surveys every five years. The last sonar surveys were conducted in 2009. Accordingly, Tres Palacios should have conducted sonar surveys in 2014.

that Tres Palacios failed to seek waiver of their requirements until after Markham, in a previous proceeding, sought an order directing Tres Palacios to comply. Markham contends that if Tres Palacios wanted to alter its certificate conditions, it should have filed an amendment application.

55. In its April 7, 2016 Answer in Docket No. CP14-27-001, Tres Palacios states that it has complied with all but two engineering conditions.⁵⁰ With respect to Engineering Condition 9 (the filing of semi-annual reports), Tres Palacios asserts that its non-compliance was an administrative oversight that was subsequently corrected. For Engineering Condition 4, the requirement to conduct a sonar survey every five years, Tres Palacios previously argued that it could not conduct sonar surveys on its caverns and, as discussed below, proposed an alternative monitoring program for the caverns. However, in this proceeding, Tres Palacios filed the results of a sonar survey on Cavern 3 and now asserts that it will conduct the sonar surveys on Caverns 1 and 2 in 2017 and 2018.

56. Tres Palacios has continued to fail to comply with Engineering Condition 4 from the 2007 Certificate Order and its purported justifications do not excuse their continued noncompliance. Rather, if Tres Palacios felt that it could not comply with the requirement to conduct a sonar survey every five years, Tres Palacios was obligated to either not accept the certificate or seek an amendment prior to any noncompliance.⁵¹ In light of these circumstances, we have referred this matter to the Office of Enforcement, for further investigation and action, as appropriate.

57. Given Tres Palacios' failure to conduct the required sonar surveys, we will also require Tres Palacios to complete sonar surveys on Caverns 1 and 2 by December 31, 2018, and December 31, 2017, respectively. Additionally, we note that the mechanical integrity tests conducted by Tres Palacios were based on data from the 2009 sonar surveys of the caverns, information that Tres Palacios acknowledges is not accurate.⁵² Therefore, Tres Palacios is directed to conduct new mechanical integrity tests on

⁵⁰ Tres Palacios has incorporated its previous answer in this proceeding.

⁵¹ *See e.g., Saltville*, 122 FERC ¶ 61,151 at PP 1, 6, 14 (granting request to eliminate certificate condition requiring sonar surveys every five years, which request was filed almost two years before the sonar surveys were due).

⁵² Engineering Condition 8(a) of Tres Palacios's 2007 certificate requires Tres Palacios to conduct a mechanical integrity test of each cavern prior to converting the cavern to natural gas storage. Additionally, Tres Palacios conducted mechanical integrity tests on its caverns in 2014 and 2015.

Caverns 1 and 2 based on data obtained from new sonar surveys within 90 days following the sonar survey and file the results with the Commission. For Cavern 3, Tres Palacios shall conduct a new mechanical integrity test based on the data from the 2016 sonar survey within 90 days of this order and file the results with the Commission.

C. Alternative Monitoring Program

58. In its April 7, 2016 Answer in Docket No. CP14-27-001, Tres Palacios submitted an alternative monitoring program in lieu of conducting sonar surveys every five years. Markham and Riverway both oppose the plan and argue that it is inconsistent with plans previously approved by the Commission. As discussed above, the 2016 sonar survey on Cavern 3 shows that some minor spalling has occurred and we are requiring Tres Palacios to submit for approval a spalling monitoring plan. In light of this, we will not approve Tres Palacios's request to remove the periodic sonar survey requirement and replace it with an alternative monitoring program.⁵³

D. Environmental Analysis

59. On May 17, 2016, the Commission issued an Environmental Assessment Report finding that no environmental impact would be involved with the approval of Tres Palacios's proposal. Markham argues that the Commission wrongly concluded that the proposal would have no environmental impact, noting that the Commission regulations state that an environmental assessment will normally be prepared for "abandonment or reduction of natural gas service under section 7 of the [NGA]."⁵⁴ Markham argues that geological resources may be impacted by the proposal and therefore, the Commission should have conducted an environmental review to assess cavern integrity. Conversely, Tres Palacios asserts that the Commission correctly determined the application was a categorical exclusion because Tres Palacios is not proposing to construct or modify any facilities or change its operations in any way and has merely asked the Commission to restate its storage capacities.

⁵³ However, after conducting all the required testing, Tres Palacios may file a new request for an alternative monitoring program.

⁵⁴ 18 C.F.R. § 380.5(b)(3) (2017).

60. We affirm the Commission staff's conclusion that Tres Palacios's proposal would have no impact on the environment. Tres Palacios's proposal would involve no construction activities⁵⁵ and, as discussed above, contrary to Markham's assertion, we have examined the issues regarding cavern integrity based on information submitted by the parties in this proceeding. Further, we are requiring Tres Palacios to take additional steps to ensure the integrity of its caverns.

61. The Commission on its own motion received and made a part of the record in this proceeding all evidence, including the applications, and exhibits thereto, and all comments and upon consideration of the record,

The Commission orders:

(A) Tres Palacios's request for abandonment is granted in part and denied in part.

(B) The total certificated capacity of Cavern 3 at the Tres Palacios Storage Facility is 10.695 Bcf, consisting of 7.859 Bcf of working gas and 2.836 Bcf of base gas. All other certificated parameters for the storage facility remain unchanged.

(C) Tres Palacios shall conduct a sonar survey on Cavern 1 by December 31, 2018, and on Cavern 2 by December 31, 2017 and file the results with the Commission.

(D) Tres Palacios shall conduct a new mechanical integrity test on Cavern 3 within 90 days, and shall conduct a new mechanical integrity tests on Caverns 1 and 2 within 90 days following the completion of each sonar survey, and file the results with the Commission.

(E) Within 90 days of the date of this order, Tres Palacios shall file for review and approval by the Director of the Division of Pipeline Certificates a spalling monitoring plan for Cavern 3. All other engineering conditions remain unchanged.

(F) Tres Palacios's request for an alternative monitoring program is denied.

(G) Markham's and Riverway's requests for hearing are denied.

⁵⁵ Section 380.5(b)(3) of our regulations should not be read to provide that the Commission will prepare an environmental assessment for proposed abandonments or reductions of service which would not have an environmental impact. *See e.g., Saltville*, 122 FERC ¶ 61,151, at P 15 (finding that no environmental review was necessary for similar request to decrease its certificated total storage capacity).

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(H) Markham's and Riverway's motions to consolidate proceedings is denied.

(I) Tres Palacios's motion to strike is denied.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.

Document Content(s)

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