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May 17, 2018

Hon. Basil Seggos, Commissioner
c/o Hon. Louis Alexander, Assistant Commissioner
New York State Department of Environmental Conservation
Office of Hearings and Mediation Services
625 Broadway, 14th Floor
Albany, New York 12233-1010

Re: *Matter of Finger Lakes LPG Storage, LLC*
DEC Project Application No. 8-4432-00085

Dear Commissioner Seggos:

As you know, appeals to Chief ALJ James McClymonds' Ruling on Issues and Party Status, dated September 8, 2017 and his Supplemental Ruling on Issues and Party Status and Order of Disposition, dated November 6, 2017 are currently pending before you. While Finger Lakes and others await your Decision on these appeals, US Salt's operations as a separate entity continue, including the development of solution mining wells. Recently, during the development of one of these wells (well 64), we became aware that well 64 may be in communication with either Gallery 10 (which consists of wells 18, 52 and 57) and/or other nearby wells (including those also being solutioned by US Salt and other wells such as well 17 or 29).

Under the draft permit issued by Department Staff, Finger Lakes would be required to conduct a pressure test of Gallery 10 to ensure there is no connection with Finger Lakes Gallery 1, as well as to identify whether other adjacent wells are in communication with Gallery 10. Given the recent information about well 64, Finger Lakes has decided to proceed with its pressure test of Gallery 10 now, but will include (as part of a revised Work Plan that is attached here for the record, but also for Staff's review and approval) as additional monitoring points wells 17, 29, 61 (it is known that well 61 is in communication with wells 60 and 62), and 64. In addition, Finger Lakes will install a pressure monitor on well 44, which is one of the wells accessing Finger Lakes Gallery 1.

The purpose of this letter is to report this development to you and ask that you hold in abeyance any Decision on the appeals that are pending until the outcome of this pressure test has been reported to the Department and those involved in this proceeding have had an opportunity to comment. Once a report of the pressure test is available, we will circulate the same to you, Department Staff and all of the intervenors and request at that time that you establish a reasonable schedule for comments on the pressure test report to be submitted to your office. Since the matter is on appeal to your

office, we do believe that the Commissioner has the authority to decide on the appeals once the results of the pressure test and any comments thereon are received and considered. *See Catskill Heritage Alliance, Inc. v. N.Y. State Dept. of Envtl. Conservation*, 2018 N.Y. App. Div. LEXIS 2526, 2018 WL 1747804 (3d Dept., Apr. 12, 2018, No. 524617).

Thank you for your consideration of this matter.

Sincerely,

BOND, SCHOENECK & KING, PLLC

Kevin M. Bernstein

KMB/ajh

cc: Service List
Chief ALJ McClymonds
Assistant Commissioner Alexander

Finger Lakes LPG Storage, LLC

Revised Work Plan
to Evaluate International Gallery 10
and Surrounding Wells

May 2018

Finger Lakes LPG Storage, LLC

Revised Work Plan to Evaluate International Gallery 10 and Surrounding Wells

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Exhibits

A: Drilling logs and inspection reports for wells 18 and 57

I. Introduction and Overview

International Gallery 10 consists of the cavern formed by wells 18, 52 and 57.

Well 18 was drilled in 1936 and a deep well pump was utilized to extract brine from this well until it was abandoned in 1942. The well was later replugged and abandoned in 1977.

Well 52 was drilled in 1972 and, along with well 57 (which was drilled in 1977), were operated as active brine injection and withdrawal wells until 1996 when both were plugged in June 1996.

The original mapped shape and outline of International Gallery 10 was determined based on a review of production records from wells 52 and 57.

On November 14, 2009, well 52 was reentered and drilled out (per DEC permit issued on November 6, 2009) and a bridge plug[1] was discovered at 2,220 ft. When the plug was completely removed, no pressure was encountered. A chart recorder had been placed on well 44 to monitor pressure in that well. The recorder showed there was 25 psig on well 44; this demonstrated no communication with well 52 since there was no pressure encountered on well 52, thus showing the isolation of the caverns.

At the same time, Baker Atlas also ran a segmented cement bond log and a microvertilog on the well after it was drilled out to a depth of 2,680 feet. A well valve was then installed and closed. A directional survey for well 52 (also provided to the DEC) was completed on November 17, 2009. The sonar for well 52 was inconclusive because the entire length of pipe to the bottom of the cavern was completely surrounded by cement. Only the bottom 34 feet of the sonar indicated a solution mined cavern was open. The logs (including the sonar survey and directional survey) for this activity at well 52 were provided to the DEC with Finger Lakes' May 14, 2010 Reservoir Suitability Report.

The initial Finite Element Analysis ("FEA") included with Finger Lakes' May 14, 2010 Reservoir Suitability Report discussed the effect of the pillar distance between the galleries (proposed Finger Lakes Gallery 1 and International Gallery 10), and stated that some micro-cracks and fissures might have been induced in the pillars during the brine storage. The FEA concluded that this was due to the relatively large 34/44 LPG gallery compared to small cavern spacing of 166 ft. Because of the lack of precise data regarding International Gallery 10, certain conservative assumptions were made in the FEA relating to pressure, location and the size of the cavern associated with International Gallery 10. The revised FEA (submitted with Finger Lakes' September 28, 2010 submission) provided an explanation of the conservative assumptions incorporated into the FEA.

[1] Well 52 had been previously plugged and abandoned on April 11, 1996.

Based on all available information, the largest area of the International Gallery 10 cavern is around wells 57 and 18; most of the dissolution was near those wells and not well 52 since the latter was primarily the production well and the casing and cement bond are intact.

In summary, Finger Lakes has provided a very conservative FEA of a future operational Finger Lakes Gallery 1 vs. a potentially leaking International Gallery 10. The FEA determined that the lack of pressure in International Gallery 10 would not affect or be affected by LPG operation of the proposed Finger Lakes Gallery 1. In addition, based on the fact that the well 52 cement bond was intact all the way to the bottom of the production casing, Finger Lakes concluded the possible leakage in International Gallery 10 was through well 18, but with few records to support evaluation of its integrity.

The purpose of this overview has been to set the stage for additional evaluation Finger Lakes proposed and the Department of Environmental Conservation (Department or DEC) approved to conduct not only in Well 18, but also Wells 52 and 57, all of which are part of International Gallery 10, to provide further assurance that there is no connection between Finger Lakes Gallery 1 and International Gallery 10 and that Gallery 10 is tight. This Revised Plan sets forth the work required under the approved Work Plan (incorporated into the Department's draft underground storage permit), describes the drilling activities conducted to date, and identifies additional monitoring points in the vicinity of Gallery 10 to determine the scope of the Gallery 10 cavern.

II. Approved Work Plan

Under the Work Plan, Finger Lakes was to initially install a wellhead and carefully drill out whatever plugs may be in place for Wells 18 and 57. Once the wells were drilled to their original total depth, cement bond and casing inspection logs would be obtained for each well. In addition, a sonar would be attempted on one of these wells to determine more precisely (instead of through historical production records) the shape of International Gallery 10 and the location and its southernmost wall or pillar.

Once the wells have been drilled out and logged, the Work Plan required Finger Lakes to evaluate the logs and sonar and prepare a recommended course of action with regard to whether each well can be completed to be used as a monitoring well or plugged and abandoned. Once an agreement has been reached with DEC as to how to treat each of these wells as noted, a separate procedure will be developed by Finger Lakes for submission and approval to DEC. Work may only begin on the completion of the well for monitoring purposes or for plugging and abandonment only upon the approval of DEC.

After the work over of wells 18 and 57 is completed, a hydrostatic pressure test will be performed on International Gallery 10 (wells 18, 52 and 57). Depending on the results of the well procedures set forth above, it may be necessary to run a liner or packer in one of these wells to accommodate the pressure test. This Revised Work Plan contains

the proposed procedure to conduct the pressure test, including the addition of pressure monitoring points in US Salt's well field.

III. Coordination with DEC

As noted below, the work performed under the approved Work Plan has been coordinated and approved by the DEC. Before any drilling activities occurred, drilling permits were issued. This Revised Work Plan provides a discussion of the drilling activities at wells 18 and 57 (and also well 29, which the Department requested be worked over as well), and includes a recommendation as to the future of these wells.

Moving forward, Finger Lakes will coordinate its pressure test with DEC, particularly in light of the results from the well workovers and resulting logs described below. The pressure test will not commence until DEC has approved of the procedure to do so. A final report will be submitted to DEC once the pressure test is completed.

IV. Report on International Gallery 10 Drilling Activities Under Work Plan and Recommendations

A. Well 18 Drilling Activities

On August 20, 2011, a drilling rig began work on well 18 on 13 3/8" surface casing and found 10 feet of conductor pipe. Drilling continued to 725 feet and did not find any 10 ¾ inch casing that was listed in well drilling files maintained by US Salt. After contacting the Department, it was decided to run 716 feet of 9 5/8", 36# J55 surface casing and cement to the surface with Class A cement. Drilling continued on air to the plug, which was encountered at 1,860 feet. At that point, brine was encountered at approximately 100 gallon per minute. At that point, drilling was continued on fluid with a mud pump. The casing was milled with 5 ¾" tubing left in the hole to 1,868 feet. The tubing was dropped and circulation was lost at 1,868 feet. The drill bit was then changed to a 6 ¼ inch tri-cone bit and drilling continued to Total Depth (TD) of 2,065 feet (Bottom of cavern or Top of Rubble pile). The lost circulation zone or porosity zone is located at a depth of 1,902 feet to 1,920 feet.

On December 5, 2011, a 7" 23#, J55 casing was run to a casing shoe depth of 2,035 feet and cemented with Class A cement and lost circulation material. The well was then secured with a 9" 3000# blind flange.

B. Well 57 Drilling Activities

On August 15, 2011, drilling began work on well 57 by reaming the 8 5/8" casing with a 7 7/8" hammer bit drilled with air until the plug was encountered at 2,214 feet. The well was drilled to a total depth of 2,770 feet. However, this depth was not accurate because the rig lost two joints of drill pipe in the hole while finding the bottom of the cavern in open hole. The well was then secured with 11" 3000 # blind flange.

C. Conclusions

Cement bond and casing inspection logs were run during each of the above referenced well drilling activities in 2011. Logs, inspection reports, Baker Hughes evaluations, well schematics, well drilling and completion reports, and directional surveys for wells 18 and 57 were previously provided to DEC. After a review of the cement bond and casing inspection logs and drilling narratives, Finger Lakes has concluded that any question related to the International Gallery 10 cavern integrity was due to well 18 lost circulation issues that had previously been encountered. However, as a result of the 2011 drilling activities, when new casing was installed in well 18 and cemented, Finger Lakes concluded that this repaired these issues and demonstrated that there is integrity in International Gallery 10. Finger Lakes will submit to the Department for approval a procedure to pressure test the International Gallery 10 to confirm Finger Lakes' conclusion.

D. Recommendations

It is the opinion of Finger Lakes that the Gallery 1 maximum fill level of 1.5 million barrels of LPG will not reach the cavern where FL2 monitoring well is proposed. Since the information found during the implementation of the work plan, Finger Lakes knows the pillar distance between Gallery 1 and International Gallery 10. Therefore, even if International Gallery 10 integrity was not repaired during work plan, LPG will never reach Gallery 10.

Finger Lakes proposes to leave wells 18, 52, and 57 as completed until Gallery 1 and International Gallery 10 pressure test and Brine/Nitrogen Interface tests are completed to check for communication. Once tests are completed Finger Lakes will submit for Department approval its recommendation as to whether any of the International Gallery 10 wells should be converted for monitoring purposes or plugged and abandoned.

V. Well Drilling Activities at Well 29

In addition to the well drilling activities conducted pursuant to the Department approved Work Plan, the Department requested similar activity at well 29. On September 17, 2011, a drilling rig began work on well 29[2] on 8 5/8" casing and drilled on air with a 7 7/8" hammer bit to 817 feet. The 8 5/8" cemented casing was then reduced down to 5 ½" 15.5# casing and drilling was continued from 817 feet to 1,890 feet where the bridge plug was encountered. When the bridge plug was drilled through there was no loss of circulation. The drilling rig continued rotating to a TD of 2,672 feet at which time the drilling rig was secured with 9" 3000# blind flange.

Finger Lakes has reviewed the logs and sonars completed on well 29 and has concluded that the well 29 top of cavern (2,440 feet) is deeper than the bottom of Finger Lakes Gallery 1 (2,383 feet), so in the unlikely event there was communication between

[2] API# 31-097-52142-00-01

well 29 and Gallery 1, LPG could not get into the well 29 cavern. Logs, inspection reports, Baker Hughes evaluations, well schematic, a well drilling and completion report, and the directional survey for well 29 **have previously been provided to DEC**.

Finger Lakes proposes to leave well 29 as completed until Gallery 1 and International Gallery 10 pressure test and Brine/Nitrogen Interface tests are completed to check for communication. A final decision on the future on this well can then be proposed once the results are known.

VI. Sonar Activities

Sonars were conducted in November 2011 on wells 18 and 57. For Well 18, the highest point of the cavern was measured at approximately 1,997 feet and the lowest point of the cavern was measured at 2,062 feet. The estimated capacity was 12,162 barrels. For well 57, the highest point of the cavern was measured at approximately 2,190 feet and the lowest point of the cavern was measured at approximately 2,503 feet.

A sonar was conducted in January 2012 on well 29. The high point of the cavern for this well was measured at approximately 2,440 feet and the lowest point of the cavern was measured at approximately 2,673 feet. The estimated capacity was 137,128 barrels. The sonar reports for wells 18, 29 and 57 **were previously provided to DEC.**

VII. Proposed Pressure Test

As noted above, the Work Plan provided that, once well drilling activities were completed, Finger Lakes would perform a pressure test. The proposed procedure, for which Finger Lakes now seeks approval from the Department, is contained in **Exhibit A** attached.

EXHIBIT A

Proposed Long Term Pressure Test for International Gallery 10, Wells 18, 52, 57

Pursuant to the Work Plan approved by the Department in connection with International Gallery 10 (Gallery 10), Finger Lakes proposes to conduct a long term hydrostatic pressure test of Gallery 10. The closest public water well is at the Lakeside Resort. Finger Lakes will monitor this well once prior to start of the test, once during the test, and once when test is complete, if the owner allows Finger Lakes access to the Lakeside Resort property. If the owner of Lakeside Resort does not authorize Finger Lakes to monitor the well, Finger Lakes will conduct pressure tests without collecting such information.

Status of Well Information

Well 18
API #31-097-51-496-00-01
Lat 42.423106 (Nad 83)
Long -76.896697 (Nad 83)
GL. ELEV. 687ft
Drilled 1/19/1936
Plugged 4/20/1977 to 1997'
Redrilled 8/20/2011
Conductor Casing 14" set at 10' existing from 1936
Surface Casing 9 5/8" 36# J-55 set at 716' placed in Aug. 2011
Intermediate Casing 7" 23# J-55 set at 1971'. DV tool and Inflatable packer set @ 1995' W/ 40' pup of 7" 23# J-55 hanging to 2035' placed in Dec 2011
Top of Salt 2022'
Top of Cavern 1997'
Total Depth 2062' in 2011
Original TD 2494' in 1936

Recent logs run
9/22/2011 Triple Combo w/ SBT
11/7/2011 Sonar Survey
12/9/2011 Gamma Ray Segmented Bond
12/27/2011 Deviation Survey

Well 52
API #31-097-61208-00-01
Lat 42.422052 (Nad 83)
Long -76.8996174 (Nad 83)
GL. ELEV. 687ft

Drilled 10-15-1972
Plugged 4-11-1996 to 2216'
Redrilled 10-15-2009
Surface Casing 13" Schedule H-40 Set at 40' Existing from 1972
Production Casing 8 5/8" 32# Range 3 Set at 2744' Existing from 1972
Top of Salt 2029'
Top of Cavern 2500'
Total Depth 2697' in 2009
Original TD 2750' in 1972

Recent logs run
11/15/2009 Gamma Ray Segmented Bond, Micro Vertilog
11/17/2009 Deviation Survey
11/19/2009 Sonar Survey

Well 57
API #31-09712858-00-02
Lat 42.411981 (Nad 83)
Long -76.894890 (Nad 83)
GL. ELEV. 692ft
Drilled 09-1977
Plugged 06-1996 to 2214'
Redrilled 08-2011
Surface Casing 14" Schedule 30 Set at 80' Existing from 1977
Production Casing 8 5/8" 32# Range 3 Set at 2256' Existing from 1977
Top of Salt 2035'
Top of Cavern 2253'
Total Depth 2329' in 2011
Original TD 2770' in 1977

Recent Logs
Sept. 2011 SBT. Cement Bond, Gamma Ray, HR Vertilog
Nov. 2011 Sonar Survey
Dec. 2011 Deviation Survey

Well Cement Bonding, and Vertilog Analysis

Well 18

Top of cement on the 7" casing is located at 1,200'. There is good cement bonding from 1,904' up to 1,400'. Starting at 1,440' the compressive strength gradually decreases up to 1,200'.
Finger Lakes conclusion: Sufficient for pressure test.

The HR Vertilog shows 0 metal loss features exceeding the 20% threshold due to this being new casing.

Finger Lakes conclusion: Sufficient for pressure test.

Well 52

Top of logged interval in this well was 500'. There is good cement from 2660' (Bottom of logged interval) up to 500'. There is excellent bonding from 2660' up to 1180'. The fluid level is at 1100'. From 1180' up to 500' there is fair bonding with less compressive strength. This may be due to no fluid in the casing.
Finger Lakes conclusion: Sufficient for pressure test.

The Micro Vertilog shows some ID pitting ranging from 20% to 57%, with one joint above 50 feet showing 87% pitting.

Finger Lakes recommendation: Install a retrievable bridge plug in the 8 5/8" casing at 2,035' "Top of Salt"(BM).

Well 57

There is excellent cement bonding from 2250' up to fluid level at 177'.

HR Vertilog shows 72 metal loss features exceeding the 20% threshold. 52 are internal and 20 are external. The most significant feature by depth of penetration is located at 10.18 ft. It is 6.85"L X 2.611" W with 49% penetration. The burst pressure using B31G calculation is 3651 psi. This feature is a cluster of pitts. The burst pressure using the effective area method is 4811 psi.

Finger Lakes conclusion: Sufficient for pressure test.

Hydrostatic Test Pressure Procedure and Calculations

Pressure monitoring devices will be installed on wells 17, 18, 29, 44, 52, 57 and 61 to record any changes in pressure as brine is injected into well 18. Starting pressures at the surface in well 18 will be 0 psig. Well 18 has the shallowest casing seat depth. The cavern casing seat is at 1,971 feet. The long term hydrostatic test with brine at a 0.8 psi/foot gradient = 1,577 psi at the 1,971 feet casing seat.

1971*0.52 = 1,025 psi (hydrostatic head).
1,577 psi – 1,025 psi = **522 psi** maximum brine wellhead injection pressure into **well 18**.

After wellhead pressure is increased from 0 to 522 psi with brine, the gallery will be allowed to stabilize until there is no appreciable pressure decline. Due to the difference in temperature of the injected brine vs. cavern/gallery brine, it might take one or more brine injections to stabilize the Gallery 10 to the required test pressure.

Pressure Test Monitoring Program

Finger Lakes shall monitor the following wells with a pressure chart recorder, 17, 18, 44, 63 and 64. Pressure gauges will be installed on wells 17, 18, 29, 44, 52, 57, 64 and 61 (which is in communication with wells 60 and 62). The timer on the chart recorders will be set on 24 hour setting and charts will be changed every 24 hours during test. During brine injection, gauges will be read and documented every hour. Gauges will be read and documented every 4 hours during the day after the gallery is pressured up.

Pillar Distance

Well 57 is approximately 188.8 feet from Well 17.
Well 57 is approximately 126.3 feet from Well 52.
Well 52 is approximately 221.8 feet from Well 44.

Test Duration

After the pressure has stabilized, the long term brine hydrostatic test will last 5 days.