



 west virginia department of environmental protection

Office of Oil and Gas
 601 57th Street, S.E.
 Charleston, WV 25304
 (304) 926-0450
 fax: (304) 926-0452

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Tuesday, February 26, 2019
 WELL WORK PLUGGING PERMIT
 Vertical Plugging

EAGLE NATRIUM LLC
 POST OFFICE BOX 191

NEW MARTINSVILLE, WV 26155

Re: Permit approval for 9
 47-051-00313-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. Please be advised that form WR-38, Affidavit of Plugging and Filling Well, is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
 Chief

Operator's Well Number: 9
 Farm Name: AXIALL CORPORATION
 U.S. WELL NUMBER: 47-051-00313-00-00
 Vertical Plugging
 Date Issued: 2/26/2019

PERMIT CONDITIONS

West Virginia Code §22-6-11 allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
2. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.
3. Well work activities shall not constitute a hazard to the safety of persons.

47-51-00313 P

WW-4B
Rev. 2/01

1) Date November 6, 2018 **03/01/2019**
2) Operator's
Well No. 9 Brine Well
3) API Well No. 47-051 - 00313

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil ____/ Gas ____/ Liquid injection Brine / waste disposal ____/
(If "Gas, Production ____ or Underground storage ____) Deep ____/ Shallow ____

5) Location: Elevation 634'-0" Watershed Ohio River
District Franklin County Marshall Quadrangle New Martinsville, WV

6) Well Operator Eagle Natrium, LLC 7) Designated Agent J. Thomas Horan
Address P.O. Box 191 Address P.O. Box 191
New Martinsville, WV 26155 New Martinsville, WV

8) Oil and Gas Inspector to be notified 9) Plugging Contractor
Name James Nicholson Name TBD
Address P.O. Box 44 Address _____
Moundsville, WV 26041

10) Work Order: The work order for the manner of plugging this well is as follows:
(See enclosed Brine Well No. 9 Plugging and Abandonment Milling Workover procedure)

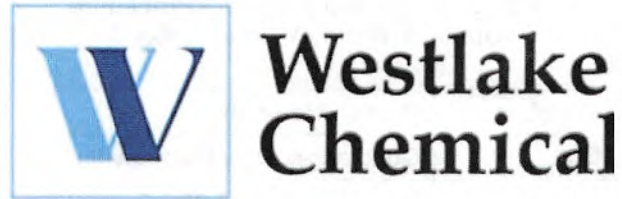
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WV Department of
Environmental Protection

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work order approved by inspector *James Nicholson* Date 11/14/18



BRINE WELL NO. 9
NATRIUM FACILITY

SPECIFICATION FOR
PLUGGING AND ABANDONMENT WORKOVER
OF BRINE WELL No. 9


OPTION 1: MILLING WORKOVER



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WV Department of
Environmental Protection

		Westlake Chemical Natrium Facility Brine Well No. 9 Plugging and Abandonment Procedure Option 1. Milling Workover Rev 3.		Project No: F1391	
				Date: August 8, 2018	
				Page: 2 of 22	
Well No: 9	State: West Virginia	County: Marshall	Field: Marshall County		
District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC		
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining		


INTRODUCTION:

Westlake Chemical Company ("Eagle Natrium, LLC") contracted Lonquist Field Service, LLC ("LFS") to develop a plugging and abandonment workover prognosis and cost estimate for an existing brine well at their Marshall County, West Virginia Natrium Facility. The existing Class III Solution Mine Well ("Brine Well No. 9") workover will consist installing a 13-5/8" 3M BOP Stack, choke and kill manifold, rotating head, and flare. The cemented 2-7/8" drill pipe fish will be washed over and pulled out of the well while milling the collapsed 8-5/8" casing. The well will be filled with 12.5 ppg kill mud and kept full throughout the milling operation and during setting cement plugs. Once the 2-7/8" has been removed from the well, the cement retainer and cement below the retainer will be milled through all the way down the top of the 5-1/2" casing at 6,183'. Cement plugs will be placed up to 5,183' and each plug will be Bradenhead squeezes to act as a pressure test and to ensure that isolation has been established from the damaged 8-5/8" casing and Marcellus formation fractures. The 8-5/8" casing will be pulled and removed from its free point all the way to surface. Additional plugs will be placed up to 4,183' to fill the remaining 8-5/8" and 8-5/8" X openhole annulus, and cement plugs will be place across the 10-3/4" intermediate casing shoe, and all the way up to surface. The wellhead will be cut below ground level and a marker installed.

The plugging and abandonment procedure and well configuration are based off of the attached proposed wellbore schematic. The following points outline main goals of the workover operations:

- Move in and rig up the workover rig contractor, BOP stack, rotating head, 3-1/2" DP, choke manifold, and flare
- Circulate and displace well with kill mud. Keeping well full during the entire workover.
- Wash over cemented 2-7/8" DP from 4,205' to 4,265' with 6-1/8" washing over shoe, 5-3/4" wash pipe. POOH
- Change and Examine Shoe. MU second 6-1/4" shoe wash over cemented 2-7/8" DP from 4,265' to 4,400'. POOH
- TIH with overshot 4,091' and into the 2-7/8" DP, and jar on 2-7/8" DP until free. If necessary a backside cutting tool can be used if the pipe won't pull free. After removing drill pipe, continue washing operations until all the drill pipe has been freed.
- Make up 6-1/4" washing shoe and wash from 4,400' to 4710'. POOH
- TIH with overshot 4,370' and into the 2-7/8" DP, and jar on 2-7/8" DP until free. If necessary a backside cutting tool can be used if the pipe won't pull free. After removing drill pipe, continue washing operations until all the drill pipe has been freed.
- Make up 6-1/4" washing shoe and wash from 4,710' to 4,920'. POOH
- TIH with overshot 4,680' and into the 2-7/8" DP, and jar on 2-7/8" DP until free. If necessary a backside cutting tool can be used if the pipe won't pull free. After removing drill pipe, continue washing operations until all the drill pipe has been freed.
- Make up 6-1/8" slick OD junk mill and mill through the cement retainer and cement down to the top of the 5-1/2" casing at 6,183'.
- Place two cement plugs (1 & 2) from 6,183' to 5,183', and performing a Bradenhead squeeze on each plug.
- Run free point on 8-5/8" casing, cut and pull 8-5/8" casing out of the well.
- Place a two additional cement plugs up to 4,183' and performing a Bradenhead squeeze on each plug.
- Place three cement plugs 200' below the 10-3/4" intermediate casing shoe, and up to surface. Pressure Test.
- Rig down workover rig and related equipment
- Excavate around the wellhead, cut and pull all the casings and wellhead a minimum of 5 feet below ground level
- Weld a 1/2 inch steel plate across the casings with the well's closure date and well API number inscribed on top
- Fill in excavation and place a sign that details well's closure date and well API number inscribed on top

PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Client Signature
JRW	08/08/2018	RSC	08/08/2018			

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Mud Program

Westlake Chemical
 Brine Well # 9
 Natrium, West Virginia

Casing Program	Hole Size (in.)	Casing Size (in.) F.I.T	MD (ft.)	Mud Density (ppg)	Fluid Loss (cc/30 min)	Mud System/Comments
		16"	60'	N/A	N/A	16" Conductor @ ~60'MD
Coal 164'-167' Coal 250'-256'						
	14 3/4"	13 3/8"	441'	N/A	N/A	
Coal 882'-884' Big Injun SS 1,286'-1,387'						Displace the annulus with 12.5 ppg kill fluid and maintain annulus full of volume throughout milling operations. Premix 1,000 bbl.'s of 12.5 ppg Kill Fluid as follows: <ol style="list-style-type: none"> 1) Fill isolated rig tanks or premix tank 3/4 full with Saturated Salt Water provided by West Lake Chemical Corporation. The initial density of the water volume will be in the 10.1 ppg range 2) Check the alkalinity and Calcium content of the make up water, reduce Calcium content to <40 mg/L with additions of Soda Ash as required 3) Raise & maintain pH to 9.5-10.5 with additions of Sodium Hydroxide (Caustic Soda) &/or Lime as required 4) Increase viscosity to 42—45 sec/qt with additions of NewZan D & NewPac R at a 1:1 ratio as required 5) Once a +42 sec/qt viscosity is reached increase Density to 12.5 ppg with additions of Barite as required Maintain while circulating and milling as follows: <ol style="list-style-type: none"> 1) Maintain viscosity to 38-42 sec/qt with additions of NewZan D & NewPac R at a 1:1 ratio 2) Maintain density at 12.5 ppg with additions of Barite as required 3) Maintain pH at 9.5-10.5 with additions of Sodium Hydroxide (Caustic Soda) &/or Lime as required 4) To reduce the corrosive effects of the Salt Water Fluid additions of NewArmour at 10-15 Gallons for every 100 bbl.'s of Salt Water is recommended 5) Lower & maintain Fluid Loss at <10 cc's/30min with additions of AquaBloc and NewPac R at a 3:1 ratio as required 6) Run 3/4"-1" stream of Saturated Salt Water into the active system at all times while adding Barite and Milling ahead 7) Prior to drilling into cement pretreatment with Sodium Bicarbonate is recommended
Weir Sand 1,764'-1,800' Berea SS 1,945'-1,966' Open CSG Perforations @ 3,290' Top 2 7/8" DP Encased in Cement @ ~4091' TOC behind DP @ 4,133' Collapsed CSG @ 4,205' Open CSG Perforations @ 4,950' Marcellus 5,236'-5,821' CSG Damage 5,720-5,790' Top 5 1/2" 6,183' Oriskany SS 6,042-6,109' Salina 6,497-6,815' Salt 6,715'-6815' TD @ 6,835'	12 1/4"	10 3/4"	1,528'	N/A	N/A	
		5 1/2"	6,183-NA	12.5	<10cc's	
		8 5/8"	6,804'	12.5	<10cc's	

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District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC		
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining		

REGULATORY INFORMATION:

Brine Well No. 9 is regulated by the West Virginia Department of Environmental Protection (WV DEP) Office of Oil and Gas (OOG). The WV DEP Office of Oil & Gas will be notified and all activities approved of prior to commencing work activities.

SAFETY INFORMATION – VISION STATEMENT:

LFS believes that all accidents and incidents are preventable. Our corporate goal is to have zero incidents, accidents, or near misses. To further our commitment to safety, LFS has staffed a Safety Director, whose sole purpose is to identify and mediate possible safety concerns and to be a resource to advise on such safety issues. He will be involved in work safety plans, managing JSAs, and offering oversight on our daily safety meeting program. We require that all of our employees and subcontractors accept that philosophy and uphold the standards of LFS. Our field supervisors are well-control certified, with both site specific and industry required safety qualifications related to new well drilling and well workovers. LFS supervisors are responsible to complete pre-job meetings with the contractors and clients, obtain daily work permits, complete JSAs, safety meetings, review Emergency Response Plans, identify any unsafe practices or potential hazards, and implement corrective actions to minimize employee exposure. LFS implements a site specific safety plan that defines the scope of work and identifies the appropriate safety standards and responsibilities for applicable parties for each project performed. LFS will implement a complete HSE plan for all phases of the operation. Our goal is always to ensure compliance with all client needs, as well as all local, State, and Federal safety and environmental regulations.

A work permit per tour, obtained from LFS, will be required, and well site safety meetings will be conducted at the beginning of each tour and at the beginning of critical operations by LFS supervisor prior to commencing any well work. All contractors involved during the tour or the critical operations will be required to attend the safety meeting, and all will be required to participate in the JSA process.

The following safety gear and personal protective equipment are required:


- Hard Hat
- Safety Glasses with side protection (shields or curvature)
- Fire Retardant Clothing
- Colored work vest when working within 150' of roads or near moving heavy equipment
- Steel-toed Safety Shoes w/Ankle Support – Leather or Rubber
- Gloves
- Fall protection required – 4' or above
- Any additional required safety equipment
- Tour and Critical Operation Safety Meeting
- JSA Form – Completed per tour and prior to critical operations by all contractors present


Additional safety and housekeeping items include:


- A Hot Work Permit is REQUIRED to perform any work where an engine will be running
- A copy of all hot-work permits will be kept on file
- The LEL will be checked at the start of the workday and anytime work ceases for more than 30 minutes
- All personnel will be required to complete at least once the safety orientation required by Westlake Chemical Natrium

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<ul style="list-style-type: none"> • Zero tolerance for any fluid release • Spills and releases to be reported to Westlake Chemical Natrium • Any Injuries and Near Misses are to be reported and investigated to/by LFS and Westlake Chemical Natrium • Vehicles to have company placards or logos • Good housekeeping standards • No Tobacco or Vapor Products on Westlake Chemical Property • Good housekeeping standards <p>A completed and detailed site specific safety plan along with a spill containment plan is being generated to accompany the workover procedure, and it will be included with the final field package for the project.</p> <p>WORK PLAN:</p> <p>The daily work activities will commence after all permits have been acquired and the pre-tour safety meetings have been completed. All depths shown below are estimated depths and based on previous workover operations. The well conditions and local geology will dictate the final setting depths of each casing string. The WV DEP Office of Oil & Gas will be contacted and plans submitted for any activity that deviates from the plan prescribed below.</p> <p>Pre-job Notifications</p> <ol style="list-style-type: none"> 1. Notify WV DEP Office of Oil & Gas (Office of Oil and Gas) 30 days prior (24 hrs at a minimum) to the commencement of the workover. <ol style="list-style-type: none"> a. WV DEP Office of Oil & Gas Contacts: 601 - 57th Street Charleston, WV 25304 (304) 926-0450 b. Contact the state inspector (James Nicholson) whose contact information is in the regulatory section of this procedure. <p>Milling Operation</p> <ol style="list-style-type: none"> 2. Move in the Workover Rig and rig up on location. Rig up rig pump and tank with mud gas separator. Perform a Rig Audit to check rig equipment and check all the safety equipment on the rig are in compliance with up to date inspections/certifications. 3. Rig up 21,000 gallon frac tank, mixing hopper for heavy kill mud, choke manifold, and flare 4. Unload 6,300' of Drill Pipe Workstring (3-1/2", 13.3 lbs/ft, S-135), 5-3/4" 18lbs/ft Toothed Bottom (Perforated) washing over shoe, 300' of 5-3/4" wash pipe, 7-5/8" Stabilizers, Crossover (XO) from wash pipe to 3-1/2" IF drill pipe 5. Mix up and circulate 12.5 ppg kill mud in the well, and keep well full while milling 						
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6. Nipple up the BOP:
 - a. DSA: 8" ANSI 1500 (9" 5M) X 13-5/8" 5M
 - b. BOP Double Ram (13-5/8" 5M X 13-5/8" 5M)
 - c. Mud Cross: (13-5/8" 5M X 13-5/8" 5M w/ 4-1/16" 3M outlets)
 - d. HCR Valves (4-1/16" 5M) and choke line to the choke manifold
 - e. BOP Annular Preventer (13-5/8" 5M X 13-5/8" 5M)
7. Test all BOP preventers, valves and choke lines every trip. Actuate ram preventers every trip on drill pipe every trip, and actuate annular at least once a week on drill pipe.
8. Rig up workover rig floor stairs and hand rails.
9. Run in the hole with test plug (3-1/2" IF) and 1jt of 3-1/2" IF DP to the casing head and seat. Open casing head annulus valve. Pressure test pipe rams, blind rams, HCR valves, mud cross, and choke line to 200 psig low, 3,000 psig high for 15 minutes. Pressure test the Annular preventer to 200 psig low, and 3,000 psig high for 15 minutes. Pull test plug out of the hole.
10. Tap 2" LP into the 10-3/4" casing, and install 2" LP 3M Ball Valve and 2" LP bull plug with 1/2" tap and needle valve with pressure gauge.
11. Nipple up the 13-5/8" 5M rotating head and install the 10" flowline to the rotating head and workover rig tank.
12. Unload and rig up power swivel.
13. Make up washover assembly BHA-1. TIH with the washover assembly to just above the top of the drill pipe fish at 4,091' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish at 4,091' MD. Continue down hole until tagging cement / tight casing at ~ 4,205' MD. (114' over TOF) Pick up 4 - 6' begin rotating at 60 - 80 RPMs, (set torque limit on swivel at ~ 3k ft/lbs. Slack off slowly to set 2 - 4k weight down on shoe. Adjust RPMs, WOB and pump rate as needed to maximize ROP. Once no further progress can be made, circulate well clean and POOH.
 - a. BHA-1:
 - i. One (1) 6 1/8" SOD x Mesh ID ocean wave shoe with a 5 3/4" WP box
 - ii. Six (6) joints of 5 3/4" WP washpipe
 - iii. One (1) washpipe top bushing
 - iv. 4 3/4" x 3 1/2 IF bumper jar
 - v. 4 3/4" x 3 1/2 IF oil jar
 - vi. Six (6) 4 3/4" x 3 1/2 IF drill collars.
 - b. **Note: If the tool joints on the 2 7/8" drill pipe are cemented against the casing wall, you may only get 1 - 3 milled over per shoe.**

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Well No: 9	State: West Virginia	County: Marshall	Field: Marshall County			
District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC			
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining			
<p>14. Assuming only two (2) tool joints were "burnt" over. Inspect shoe and wash pipe, change out shoe to BHA-2. TIH with the washover assembly to just above the top of the drill pipe fish at 4,091' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish at Continue down hole until tagging cement at previously washed depth ~ 4,265'. Continue washing / milling over the cemented up drill pipe until a full swallow is made. Circulate well clean before POOH with the wash over assembly.</p> <p>a. BHA-2:</p> <ol style="list-style-type: none"> One (1) 6 1/8" SOD x Mesh ID ocean wave shoe with a 5 3/4" WP box Six (10) joints of 5 3/4" WP washpipe One (1) washpipe top bushing One (1) 4 3/4" x 3 1/2 IF bumper jar One (1) 4 3/4" x 3 1/2 IF oil jar Six (6) 4 3/4" x 3 1/2 IF drill collars. <p>b. Note: Should it become apparent that the 8 5/8" casing has collapsed around the 2 7/8 drill pipe, Move to Step 14. <i>15</i></p> <p>15. (Optional if it is apparent that 8-5/8" casing has collapsed around the 2-7/8" drill pipe) Make up a washover assembly BHA-3. TIH with the washover assembly to just above the top of the drill pipe fish at 4,091' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish at 4,091' MD. Continue down hole until tagging cement / tight casing at ~ 4,205' MD. (114' over TOF) Pick up 4 - 6' begin rotating at 60 - 80 RPMs, (set torque limit on swivel at ~ 3k ft/lbs. Slack off slowly to set 2 - 4k weight down on shoe, mill up the 8 5/8" casing while washing over the 2 7/8" drill pipe down to 4,400'. Adjust RPMs, WOB and pump rate as needed to maximize ROP. Once no further progress can be made, circulate well clean and POOH.</p> <p>a. BHA-3:</p> <ol style="list-style-type: none"> One (1) 6 1/8" ROD x RID ocean wave shoe with a 5 3/4" WP box Six (6) joints of 5 3/4" WP washpipe One (1) washpipe top bushing One (1) 4 3/4" x 3 1/2 IF bumper jar One (1) 4 3/4" x 3 1/2 IF oil jar Six (6) 4 3/4" x 3 1/2 IF drill collars. <p>16. Make up an overshot assembly BHA-4. TIH with the overshot assembly to just above the top of the fish at 4,370'. Establish and record all parameters. Slack-off slowly, engage fish. Make several attempts to Work / Pull / Pump / Jar fish free.</p> <p>a. BHA-4:</p> <ol style="list-style-type: none"> One (1) 5 3/4" overshot dressed with a 4 1/8" basket grapple and MCP One (1) pump out sub One (1) 4 3/4" x 3 1/2 IF bumper jar One (1) 4 3/4" x 3 1/2 IF oil jar Six (6) 4 3/4" x 3 1/2 IF drill collars One (1) 4 3/4" x 3 1/2 IF jar energizer. <p>b. Note: Should all attempts at freeing the fish fail move to step 17 or 18.</p>						
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District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC			
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining			
<p>14. Assuming only two (2) tool joints were "burnt" over. Inspect shoe and wash pipe, change out shoe to BHA-2. TIH with the washover assembly to just above the top of the drill pipe fish at 4,091' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish at Continue down hole until tagging cement at previously washed depth ~ 4,265'. Continue washing / milling over the cemented up drill pipe until a full swallow is made. Circulate well clean before POOH with the wash over assembly.</p> <p>a. BHA-2:</p> <ul style="list-style-type: none"> i. One (1) 6 1/8" SOD x Mesh ID ocean wave shoe with a 5 3/4" WP box ii. Six (10) joints of 5 3/4" WP washpipe iii. One (1) washpipe top bushing iv. One (1) 4 3/4" x 3 1/2 IF bumper jar v. One (1) 4 3/4" x 3 1/2 IF oil jar vi. Six (6) 4 3/4" x 3 1/2 IF drill collars. <p>b. Note: Should it become apparent that the 8 5/8" casing has collapsed around the 2 7/8 drill pipe, Move to Step 14. <i>15</i></p> <p>15. (Optional if it is apparent that 8-5/8" casing has collapsed around the 2-7/8" drill pipe) Make up a washover assembly BHA-3. TIH with the washover assembly to just above the top of the drill pipe fish at 4,091' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish at 4,091' MD. Continue down hole until tagging cement / tight casing at ~ 4,205' MD. (114' over TOF) Pick up 4 - 6' begin rotating at 60 - 80 RPMs, (set torque limit on swivel at ~ 3k ft/lbs. Slack off slowly to set 2 - 4k weight down on shoe, mill up the 8 5/8" casing while washing over the 2 7/8" drill pipe down to 4,400'. Adjust RPMs, WOB and pump rate as needed to maximize ROP. Once no further progress can be made, circulate well clean and POOH.</p> <p>a. BHA-3:</p> <ul style="list-style-type: none"> i. One (1) 6 1/8" ROD x RID ocean wave shoe with a 5 3/4" WP box ii. Six (6) joints of 5 3/4" WP washpipe iii. One (1) washpipe top bushing iv. One (1) 4 3/4" x 3 1/2 IF bumper jar v. One (1) 4 3/4" x 3 1/2 IF oil jar vi. Six (6) 4 3/4" x 3 1/2 IF drill collars. <p>16. Make up an overshot assembly BHA-4. TIH with the overshot assembly to just above the top of the fish at 4,370'. Establish and record all parameters. Slack-off slowly, engage fish. Make several attempts to Work / Pull / Pump / Jar fish free.</p> <p>a. BHA-4:</p> <ul style="list-style-type: none"> i. One (1) 5 3/4" overshot dressed with a 4 1/8" basket grapple and MCP ii. One (1) pump out sub iii. One (1) 4 3/4" x 3 1/2 IF bumper jar iv. One (1) 4 3/4" x 3 1/2 IF oil jar v. Six (6) 4 3/4" x 3 1/2 IF drill collars vi. One (1) 4 3/4" x 3 1/2 IF jar energizer. <p>b. Note: Should all attempts at freeing the fish fail move to step 17 or 18.</p>						
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17. **(Optional if the 2-7/8" drill was unable to be freed but is clear on the inside of the 2-7/8" drill pipe)** Rig up and test Wireline equipment. Make up and RIH w/ an appropriate size gage ring as deep as possible, POOH in the event that the ID of the drill pipe is clear, Make up and RIH with a string shot. Back off the washed over drill pipe 30' above the washed over section at 4,400' MD. POOH and rig down E/line equipment.
18. **(Optional if the 2-7/8" drill was unable to be freed but is NOT clear on the inside of the 2-7/8" drill pipe)** Should the ID of the washed over drill pipe is plugged, Release the overshot and POOH. A 6-1/6" outside cutter could be run to cut and recover the washed over length of drill pipe.
19. Once the drill pipe has been recover from the back off at ~4,370' MD. Make up a washover assembly BHA-5. TIH with the washover assembly to just above the top of the drill pipe fish at 4,370' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish and continue down hole until tagging cement at previously washed depth ~ 4,400'. Continue washing / milling over the cemented up drill pipe until a full swallow is made ~ 4,710' MD. Circulate well clean before POOH with the wash over assembly.
 - a. BHA-5:
 - i. One (1) 6 1/8" SOD x Mesh ID ocean wave shoe with a 5 3/4" WP box
 - ii. Six (10) joints of 5 3/4" WP washpipe
 - iii. One (1) washpipe top bushing
 - iv. One (1) 4 3/4" x 3 1/2 IF bumper jar
 - v. One (1) 4 3/4" x 3 1/2 IF oil jar
 - vi. Six (6) 4 3/4" x 3 1/2 IF drill collars.
20. Make up a Screw in assembly BHA-6. TIH with the screw in assembly to just above the top of the fish at 4,370". Establish and record all parameters. Space out work string. Slack off slowly and screw into the fish. Make several attempts to Work / Pull / Pump / Jar fish free.
 - a. BHA-6:
 - i. One (1) 2 7/8 IF cut lip screw in sub
 - ii. One (1) crossover sub
 - iii. One (1) 4 3/4" x 3 1/2 IF bumper jar
 - iv. One (1) 4 3/4" x 3 1/2 IF oil jar
 - v. Six (6) 4 3/4" x 3 1/2 IF drill collars
 - vi. One (1) 4 3/4" x 3 1/2 IF jar energizer.
 - b. NOTE: Should all attempts at freeing the fish fail. Rig up and test Wireline equipment. Make up and RIH with a string shot. Back off the washed over drill pipe 30' above the washed over section at 4,680' MD. POOH and rig down Wireline equipment.

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District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC			
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining			
<p>21. Once the drill pipe has been recover from the back off at ~4,680' MD. Make up a washover assembly BHA-7. TIH with the washover assembly to just above the top of the drill pipe fish at 4,680' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish at Continue down hole until tagging cement at previously washed depth ~ 4,710'. Continue washing / milling over the cemented up drill pipe until the cement retainer at 4,920' id reached. Circulate well clean before POOH with the wash over assembly.</p> <p>a. BHA-7:</p> <ol style="list-style-type: none"> i. One (1) 6 1/8" SOD x Mesh ID ocean wave shoe with a 5 3/4" WP box ii. Six (8) joints of 5 3/4" WP washpipe iii. One (1) washpipe top bushing iv. One (1) 4 3/4" x 3 1/2 IF bumper jar v. One (1) 4 3/4" x 3 1/2 IF oil jar vi. Six (6) 4 3/4" x 3 1/2 IF drill collars. <p>22. Make up an overshot assembly BHA-8. TIH with the overshot assembly to just above the top of the fish at 4,680'. Establish and record all parameters. Slack-off slowly, engage fish. Work / Pull / Pump / Jar fish free. POOH and lay down recovered fish.</p> <p>a. BHA-8:</p> <ol style="list-style-type: none"> i. One (1) 5 3/4" overshot dressed with a 4 1/8" basket grapple and MCP ii. One (1) pump out sub iii. One (1) 4 3/4" x 3 1/2 IF bumper jar iv. One (1) 4 3/4" x 3 1/2 IF oil jar v. Six (6) 4 3/4" x 3 1/2 IF drill collars vi. One (1) 4 3/4" x 3 1/2 IF jar energizer. <p>b. Once all the 2 7/8 drill pipe has been recovered move to the next step</p> <p>23. Make up a mill assembly BHA-9. TIH with the mill assembly to just above the top of cement retainer at 4,920' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM and rotating at ~ 80 RPMs, slack off slowly to keep 2 - 4k weight down on the mill. Continue milling on the cement retainer until it falls down the hole. Chase the remnants of the retainer down to the top of the 5 1/2" casing at 6,183' MD. Circulate well clean before pulling out of the hole.</p> <p>a. BHA-9</p> <ol style="list-style-type: none"> i. One (1) 6 1/8" bladed junk mill ii. Two (2) 5" OD boot baskets iii. One (1) double box sub iv. Two (2) 4 3/4" x 3 1/2 IF drill collars v. One (1) 4 3/4" x 3 1/2 IF bumper jar vi. One (1) 4 3/4" x 3 1/2 IF oil jar vii. Six (4) 4 3/4" x 3 1/2 IF drill collars viii. One (1) 4 3/4" x 3 1/2 IF jar energizer. <p>b. NOTE: Size of mill may vary due to collapsed casing</p> <p>24. Rig down power swivel and load out. Laydown and load out milling tools and wash pipe.</p>						
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21. Once the drill pipe has been recover from the back off at ~4,680' MD. Make up a washover assembly BHA-7. TIH with the washover assembly to just above the top of the drill pipe fish at 4,680' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM, lightly tag and work over the top of the fish at Continue down hole until tagging cement at previously washed depth ~ 4,710'. Continue washing / milling over the cemented up drill pipe until the cement retainer at 4,920' id reached. Circulate well clean before POOH with the wash over assembly.
- a. BHA-7:
 - i. One (1) 6 1/8" SOD x Mesh ID ocean wave shoe with a 5 3/4" WP box
 - ii. Six (8) joints of 5 3/4" WP washpipe
 - iii. One (1) washpipe top bushing
 - iv. One (1) 4 3/4" x 3 1/2 IF bumper jar
 - v. One (1) 4 3/4" x 3 1/2 IF oil jar
 - vi. Six (6) 4 3/4" x 3 1/2 IF drill collars.
22. Make up an overshot assembly BHA-8. TIH with the overshot assembly to just above the top of the fish at 4,680'. Establish and record all parameters. Slack-off slowly, engage fish. Work / Pull / Pump / Jar fish free. POOH and lay down recovered fish.
- a. BHA-8:
 - i. One (1) 5 3/4" overshot dressed with a 4 1/8" basket grapple and MCP
 - ii. One (1) pump out sub
 - iii. One (1) 4 3/4" x 3 1/2 IF bumper jar
 - iv. One (1) 4 3/4" x 3 1/2 IF oil jar
 - v. Six (6) 4 3/4" x 3 1/2 IF drill collars
 - vi. One (1) 4 3/4" x 3 1/2 IF jar energizer.
 - b. Once all the 2 7/8 drill pipe has been recovered move to the next step
23. Make up a mill assembly BHA-9. TIH with the mill assembly to just above the top of cement retainer at 4,920' MD. Establish and record all parameters. Begin circulating at 2 - 4 BPM and rotating at ~ 80 RPMs, slack off slowly to keep 2 - 4k weight down on the mill. Continue milling on the cement retainer until it falls down the hole. Chase the remnants of the retainer down to the top of the 5 1/2" casing at 6,183' MD. Circulate well clean before pulling out of the hole.
- a. BHA-9
 - i. One (1) 6 1/8" bladed junk mill
 - ii. Two (2) 5" OD boot baskets
 - iii. One (1) double box sub
 - iv. Two (2) 4 3/4" x 3 1/2 IF drill collars
 - v. One (1) 4 3/4" x 3 1/2 IF bumper jar
 - vi. One (1) 4 3/4" x 3 1/2 IF oil jar
 - vii. Six (4) 4 3/4" x 3 1/2 IF drill collars
 - viii. One (1) 4 3/4" x 3 1/2 IF jar energizer.
 - b. **NOTE: Size of mill may vary due to collapsed casing**
24. Rig down power swivel and load out. Laydown and load out milling tools and wash pipe.

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Plugging and Abandonment Operation


- 25. **Notify WV DEP Office of Oil & Gas 24 hours prior to cementing (See WV DEP Office of Oil & Gas Contacts in Step 1).**
- 26. Rig up cement equipment, and mix and pump cement plug No.1 of 15.6 ppg Class A Cement – Neat from 6183'-5,683'. Pull up 500', and reverse circulate until clear fluid comes to surface. Pull up another 2000', and close annular and perform a Bradenhead squeeze on the cement plug. WOC for 8-12 hours.
- 27. TIH and tag the top of the plug, and reverse out any green cement from the well. Mix and pump cement plug No.2 of 15.6 ppg Class A Cement – Neat from 5,683' – 5,183'. Pull up 500', and reverse circulate until clear fluid comes to surface. Pull up another 2000', and close annular and perform a Bradenhead squeeze on the cement plug. WOC for 8-12 hours.
- 28. Rig down rig floor, hand rails and stairs. Nipple down flow line 13-5/8" 5M rotating head and 10" flowline. Nipple down 13-5/8" 5M BOP Stack, DSA, and 8" ANSI 1500 Valve. Release 11" 3M rotating head.
- 29. Nipple up the BOP onto of the wellhead spool hanging off the 8-5/8".
 - a. DSA: to bottom of wellhead flange to 13-5/8" 5M
 - b. BOP Double Ram (13-5/8" 5M X 13-5/8" 5M)
 - c. Mud Cross: (13-5/8" 5M X 13-5/8" 5M w/ 4-1/16" 3M outlets)
 - d. HCR Valves (4-1/16" 5M) and choke line to the choke manifold
 - e. BOP Annular Preventer (13-5/8" 5M X 13-5/8" 5M)
- 30. Test all BOP preventers, valves and choke lines every trip. Actuate ram preventers every trip on drill pipe every trip, and actuate annular at least once a week on drill pipe.
- 31. Rig up workover rig floor stairs and hand rails.
- 32. Run in the hole with test plug (3-1/2" IF) and 1jt of 3-1/2" IF DP to the casing head and seat. Open casing head annulus valve. Pressure test pipe rams, blind rams, HCR valves, mud cross, and choke line to 200 psig low, 3,000 psig high for 15 minutes. Pressure test the Annular preventer to 200 psig low, and 3,000 psig high for 15 minutes. Pull test plug out of the hole.
- 33. Move in and rig up casing crews to pull 8-5/8" casing. Rig up 8-5/8" casing spear and pick up the 8-5/8" casing to the rig floor. MIRU Wireline, and run free point on the 8-5/8" casing, and POOH and switch tools. Run chemical cutter down to the free point and cut the 8-5/8 casing. RDMO wireline. Pick up 8-5/8" above rig floor and set slips, Lay down casing spear. Pull and laydown 8-5/8" casing out of the well. Rig down casing crew.
- 34. TIH and tag the top of the plug 5,183', and reverse out any green cement from the well. Mix and pump cement plug No.3 of 15.6 ppg Class A Cement – Neat from 5,183' – 4,683'. Pull up 500', and reverse circulate until clear fluid comes to surface. Pull up another 2000', and close annular and perform a Bradenhead squeeze on the cement plug. WOC for 8-12 hours.
- 35. TIH and tag the top of the plug 4,683', and reverse out any green cement from the well. Mix and pump cement plug No.4 of 15.6 ppg Class A Cement – Neat from 4,683' – 4,183'. Pull up 500', and reverse circulate until clear fluid

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<p>comes to surface. Pull up another 2000', and close annular and perform a Bradenhead squeeze on the cement plug. WOC for 8-12 hours.</p> <p>36. TIH with open ended with 3-1/2" IF drill pipe down to 4,183' and reverse circulate any green cement from the well. Pull up to 1,828' which is 300' below the 10-3/4" intermediate casing.</p> <p>37. Rig up cement equipment, mix and pump high viscous gell pill spacer (No. 5) from 1,828' to 1,728'. Pull up to 1728', and pump mix and pump cement plug No.6 of 15.6 ppg Class A Cement – Neat from 1728'-1228'. Pull up 500', and reverse circulate until clear fluid comes to surface. WOC for 8-12 hours.</p> <p>38. TIH and tag the top of the plug, and reverse out any green cement from the well.</p> <p>39. Install TIW and pressure test the cement plug to for 30 minutes Remove TIW</p> <p>40. Mix and pump cement plug No.7 of 15.6 ppg Class A Cement – Neat from 1,228' – 728'. Pull up 500', and reverse circulate until clear fluid comes to surface. WOC for 8-12 hours.</p> <p>41. TIH and tag the top of the plug, and reverse out any green cement from the well. Mix and pump cement plug No.8 of 15.6 ppg Class A Cement – Neat from 728' – 228'. Pull up 500', and reverse circulate until clear fluid comes to surface. WOC for 8-12 hours.</p> <p>42. TIH and tag the top of the plug, and reverse out any green cement from the well. Mix and pump cement plug No.9 of 15.6 ppg Class A Cement – Neat from 228' – 0'. Pull out of the hole. WOC for 8-12 hours.</p> <p>43. Nipple down the 5M BOP Stack, DSA.</p> <p>44. Haul off mud and green cement "waste water" to disposal to be solidified at Quala disposal.</p> <p>45. Rig down workover equipment, 21,000 gallon frac tank, mixing hopper for heavy kill mud, choke manifold, and flare</p> <p>46. Move in excavation equipment and welders</p> <p>47. Excavate around wellhead to expose casing</p> <ol style="list-style-type: none"> 5' – 6' below ground level <p>48. Cut and remove wellhead and casing</p> <ol style="list-style-type: none"> 5' – 6' below ground level Add cement if necessary <p>49. Weld ½ inch thick steel plate on casing</p> <ol style="list-style-type: none"> API Number and plug date to be inscribed on top of steel plate Surface monuments installed as per WV DEP OOG and Westlake requirements <p>50. Close up excavation and move off location</p>						
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District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC			
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining			
<p>comes to surface. Pull up another 2000', and close annular and perform a Bradenhead squeeze on the cement plug. WOC for 8-12 hours.</p> <p>36. TIH with open ended with 3-1/2" IF drill pipe down to 4,183' and reverse circulate any green cement from the well. Pull up to 1,828' which is 300' below the 10-3/4" intermediate casing.</p> <p>37. Rig up cement equipment, mix and pump high viscous gell pill spacer (No. 5) from 1,828' to 1,728'. Pull up to 1728', and pump mix and pump cement plug No.6 of 15.6 ppg Class A Cement – Neat from 1728'-1228'. Pull up 500', and reverse circulate until clear fluid comes to surface. WOC for 8-12 hours.</p> <p>38. TIH and tag the top of the plug, and reverse out any green cement from the well.</p> <p>39. Install TIW and pressure test the cement plug to for 30 minutes Remove TIW</p> <p>40. Mix and pump cement plug No.7 of 15.6 ppg Class A Cement – Neat from 1,228' – 728'. Pull up 500', and reverse circulate until clear fluid comes to surface. WOC for 8-12 hours.</p> <p>41. TIH and tag the top of the plug, and reverse out any green cement from the well. Mix and pump cement plug No.8 of 15.6 ppg Class A Cement – Neat from 728' – 228'. Pull up 500', and reverse circulate until clear fluid comes to surface. WOC for 8-12 hours.</p> <p>42. TIH and tag the top of the plug, and reverse out any green cement from the well. Mix and pump cement plug No.9 of 15.6 ppg Class A Cement – Neat from 228' – 0'. Pull out of the hole. WOC for 8-12 hours.</p> <p>43. Nipple down the 5M BOP Stack, DSA.</p> <p>44. Haul off mud and green cement "waste water" to disposal to be solidified at Quala disposal.</p> <p>45. Rig down workover equipment, 21,000 gallon frac tank, mixing hopper for heavy kill mud, choke manifold, and flare</p> <p>46. Move in excavation equipment and welders</p> <p>47. Excavate around wellhead to expose casing</p> <p style="padding-left: 20px;">a. 5' – 6' below ground level</p> <p>48. Cut and remove wellhead and casing</p> <p style="padding-left: 20px;">b. 5' – 6' below ground level</p> <p style="padding-left: 20px;">c. Add cement if necessary</p> <p>49. Weld 1/2 inch thick steel plate on casing</p> <p style="padding-left: 20px;">d. API Number and plug date to be inscribed on top of steel plate</p> <p style="padding-left: 20px;">e. Surface monuments installed as per WV DEP OOG and Westlake requirements</p> <p>50. Close up excavation and move off location</p>						
PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Client Signature
JRW	08/08/2018	RSC	08/08/2018			

		Westlake Chemical Natrium Facility Brine Well No. 9 Plugging and Abandonment Procedure Option 1. Milling Workover Rev 3.		Project No: F1391	
				Date: August 8, 2018	
				Page: 11 of 22	
Well No: 9	State: West Virginia	County: Marshall	Field: Marshall County		
District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC		
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining		

Reporting Information

Daily Reports – Email or Fax

- Stephen Clark
- Ed McLaughlin
- Dick Lonquist
- Eric Busch
- Joshua Willis

Final Reports – Email and Hard Copy

- Stephen Clark
- Lonquist & Company, LLC

Final Reports to include:

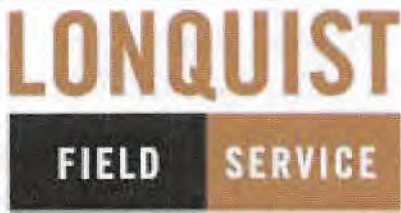
- Daily Reports
- Well Schematics
- Well Completion Report
- Well Logs
- Photos


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Client Signature

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		Westlake Chemical Natrium Facility Brine Well No. 9 Plugging and Abandonment Procedure Option 1. Milling Workover Rev 3.			Project No: F1391	
					Date: August 8, 2018	
					Page: 12 of 22	
Well No: 9	State: West Virginia	County: Marshall	Field: Marshall County			
District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC			
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining			
Well Owner Eagle Natrium, LLC 16339 Energy Road, Proctor West Virginia, 26055 <ul style="list-style-type: none"> ▪ Stephen M. Clark, P.E. – Owner's Representative <ul style="list-style-type: none"> ○ Telephone – 304.455.2200, Ext. 3318 ○ Cell – 304.266.8264 ○ Email – Stephen.Clark@Westlake.com 						
Regulatory West Virginia Department of Environmental Protection Office of Oil and Gas 601 - 57th Street Charleston, WV 25304 (304) 926-0450 <ul style="list-style-type: none"> ▪ Jeff McLaughlin – Permitting - Vertical Wells/Plugging - Technical Analyst <ul style="list-style-type: none"> ○ Telephone – 304-926-0499, ext. 1614 ○ Email – Jeffrey.W.McLaughlin@wv.gov ▪ James Nicholson – WVDEP Office of Oil and Gas Inspector for Marshall (051) <ul style="list-style-type: none"> ○ Telephone – 304-552-3874 ○ Email – James.I.Nicholson@wv.gov 						
PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Client Signature
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District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC		
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining		

Contractor

Lonquist Field Service, LLC
1001 McKinney, Suite 1650
Houston, TX 77002

- Richard Lonquist – President
 - Telephone – (512) 699-1527
 - Fax – (512) 732-9816
 - Email – richard@lonquist.com
- Eric Busch – Sr. Vice President
 - Office – (713) 559-9953
 - Mobile – (832) 216-0785
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 - Email – eric@lonquist.com
- Rob Crews – Vice President
 - Office – (713) 559-9955
 - Mobile – (713) 320-2278
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 - Email – gerald@lonquist.com
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 - Mobile – (601) 940-0988
 - Fax – (713) 559-9959
 - Email – justin@lonquist.com

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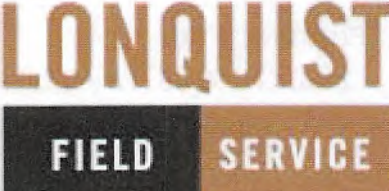
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Environmental Protection

PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Client Signature
JRW	08/08/2018	RSC	08/08/2018			

90200-120-175

03/01/2019

	Westlake Chemical Natrium Facility Brine Well No. 9		Project No: F1391
	Plugging and Abandonment Procedure Option 1. Milling Workover Rev 3.		Date: August 8, 2018
			Page: 18 of 22

Well No: 9	State: West Virginia	County: Marshall	Field: Marshall County
District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC
API No: 47-051-0313	Estimated TD: 6,815'	Target Geology: Salina Formation	Status: Solution Mining

PROPOSED WELLBORE SCHEMATICS

PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Client Signature
JRW	08/08/2018	RSC	08/08/2018			



Westlake Chemical
 Natrium Facility
 Brine Well No. 9
 Plugging and Abandonment Procedure
 Option 1. Milling Workover Rev 3.

Project No: F1391

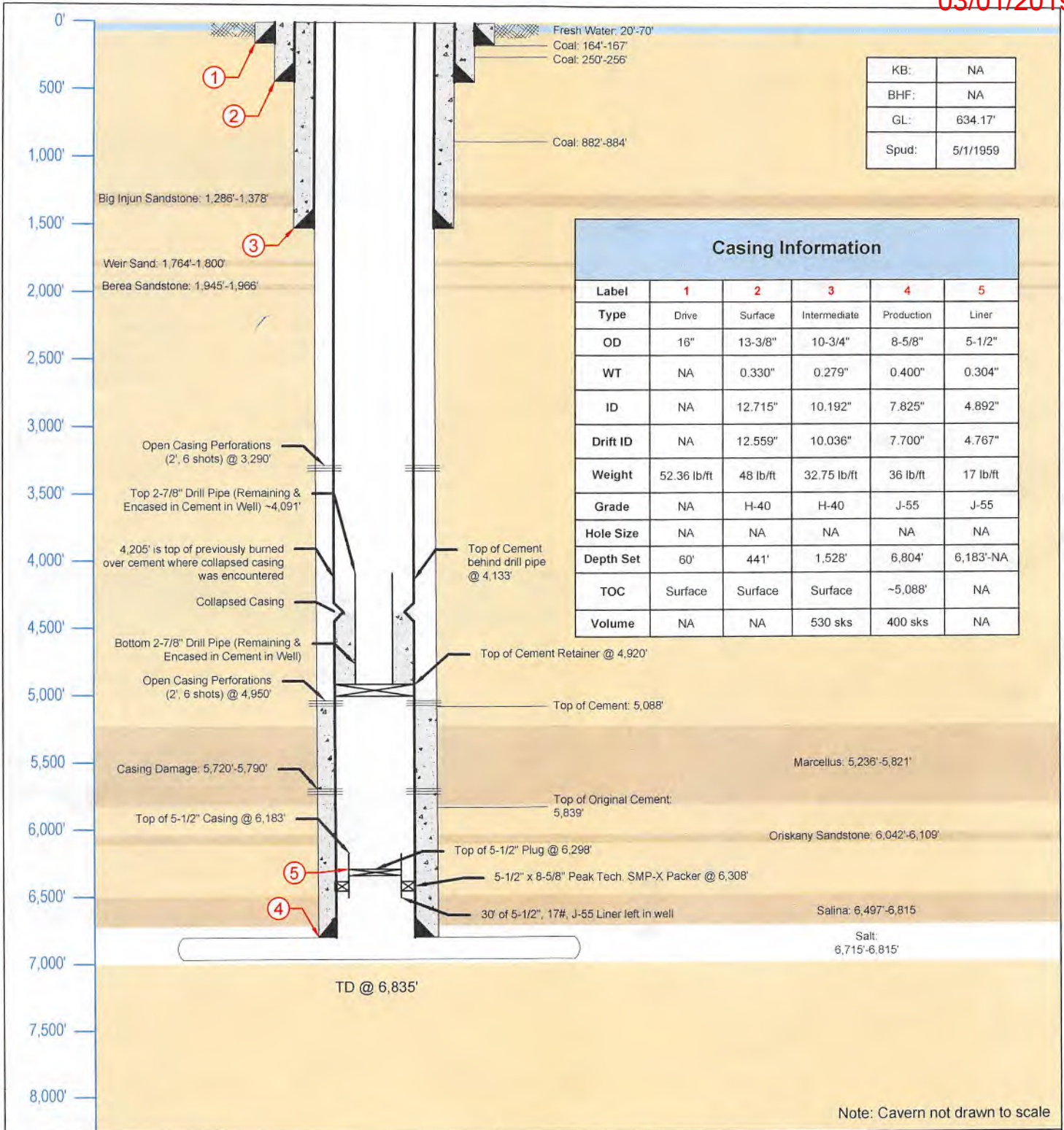
Date: August 8, 2018

Page: 18 of 22

Well No: 9	State: West Virginia	County: Marshall	Field: Marshall County
District: Franklin	Location: TBD	Quadrangle: New Martinsville	Operator: Eagle Natrium, LLC
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PROPOSED WELLBORE SCHEMATICS

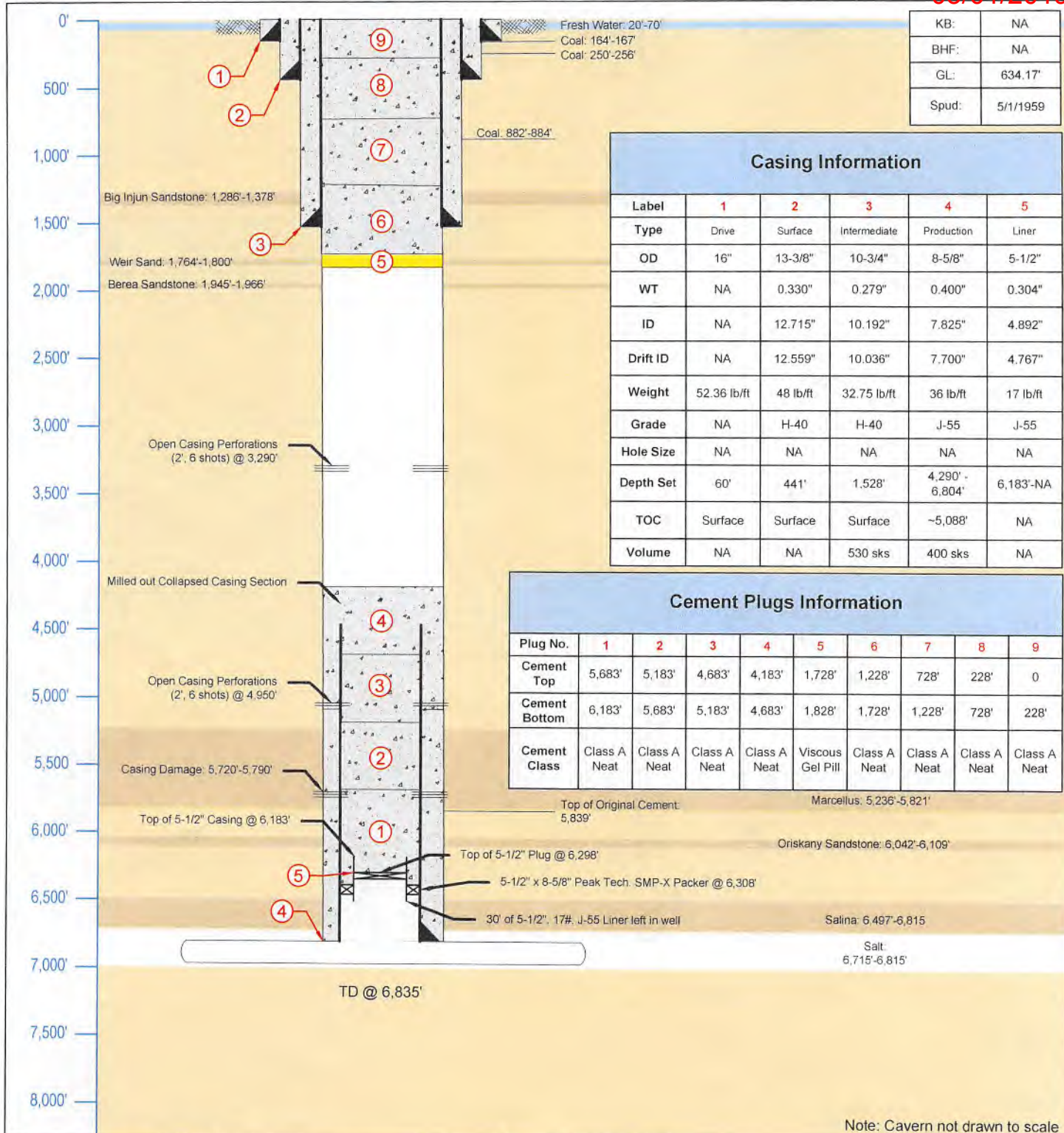
PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Client Signature
JRW	08/08/2018	RSC	08/08/2018			



Note: Cavern not drawn to scale

 <p>AUSTIN WICHITA HOUSTON CALGARY</p> <p>Texas License F-9147</p> <p>3345 Bee Cave Road, Suite 201 Austin, Texas 78746 Tel: 512.732.9812 Fax: 512.732.9816</p>	Eagle Natrium LLC		#9 Brine Well - Current Schematic	
	Country: USA		State/Province: West Virginia	
	District: Franklin (03)		County/Parish: Marshall (51)	
	API No: 47-051-0313		Quadrangle: New Martinsville (509)	
	Permit No: NA		Field: Marshall County	
Drawn: CJG		Survey/STR: NA		
Rev No:		Well Type/Status: NA		
Reviewed: JRW		Date: 07/17/18		
Notes:		Approved: JRW		

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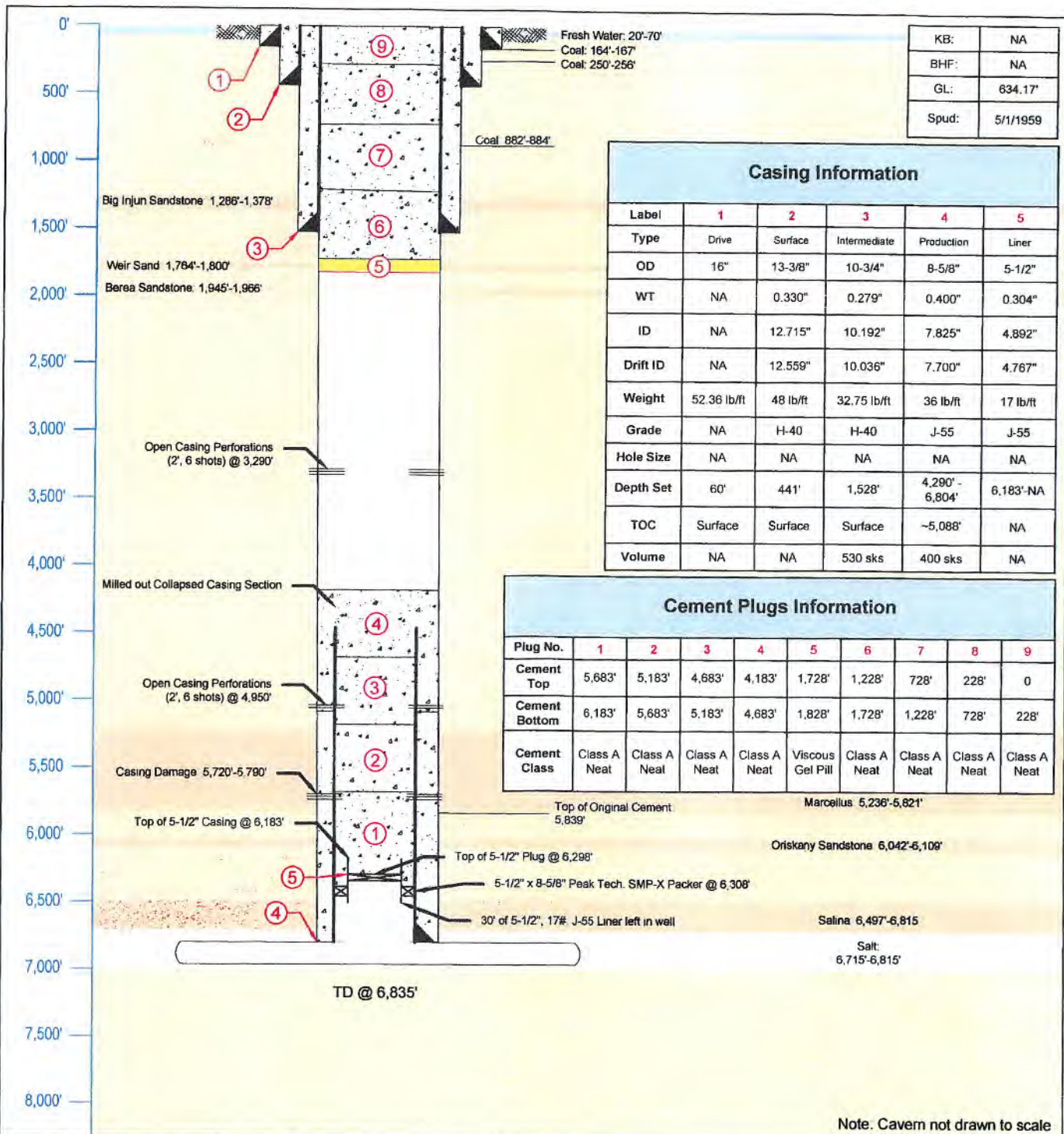
KB:	NA
BHF:	NA
GL:	634.17'
Spud:	5/1/1959

Casing Information					
Label	1	2	3	4	5
Type	Drive	Surface	Intermediate	Production	Liner
OD	16"	13-3/8"	10-3/4"	8-5/8"	5-1/2"
WT	NA	0.330"	0.279"	0.400"	0.304"
ID	NA	12.715"	10.192"	7.825"	4.892"
Drift ID	NA	12.559"	10.036"	7.700"	4.767"
Weight	52.36 lb/ft	48 lb/ft	32.75 lb/ft	36 lb/ft	17 lb/ft
Grade	NA	H-40	H-40	J-55	J-55
Hole Size	NA	NA	NA	NA	NA
Depth Set	60'	441'	1,528'	4,290' - 6,804'	6,183'-NA
TOC	Surface	Surface	Surface	-5,088'	NA
Volume	NA	NA	530 sks	400 sks	NA

Cement Plugs Information									
Plug No.	1	2	3	4	5	6	7	8	9
Cement Top	5,683'	5,183'	4,683'	4,183'	1,728'	1,228'	728'	228'	0
Cement Bottom	6,183'	5,683'	5,183'	4,683'	1,828'	1,728'	1,228'	728'	228'
Cement Class	Class A Neat	Class A Neat	Class A Neat	Class A Neat	Viscous Gel Pill	Class A Neat	Class A Neat	Class A Neat	Class A Neat

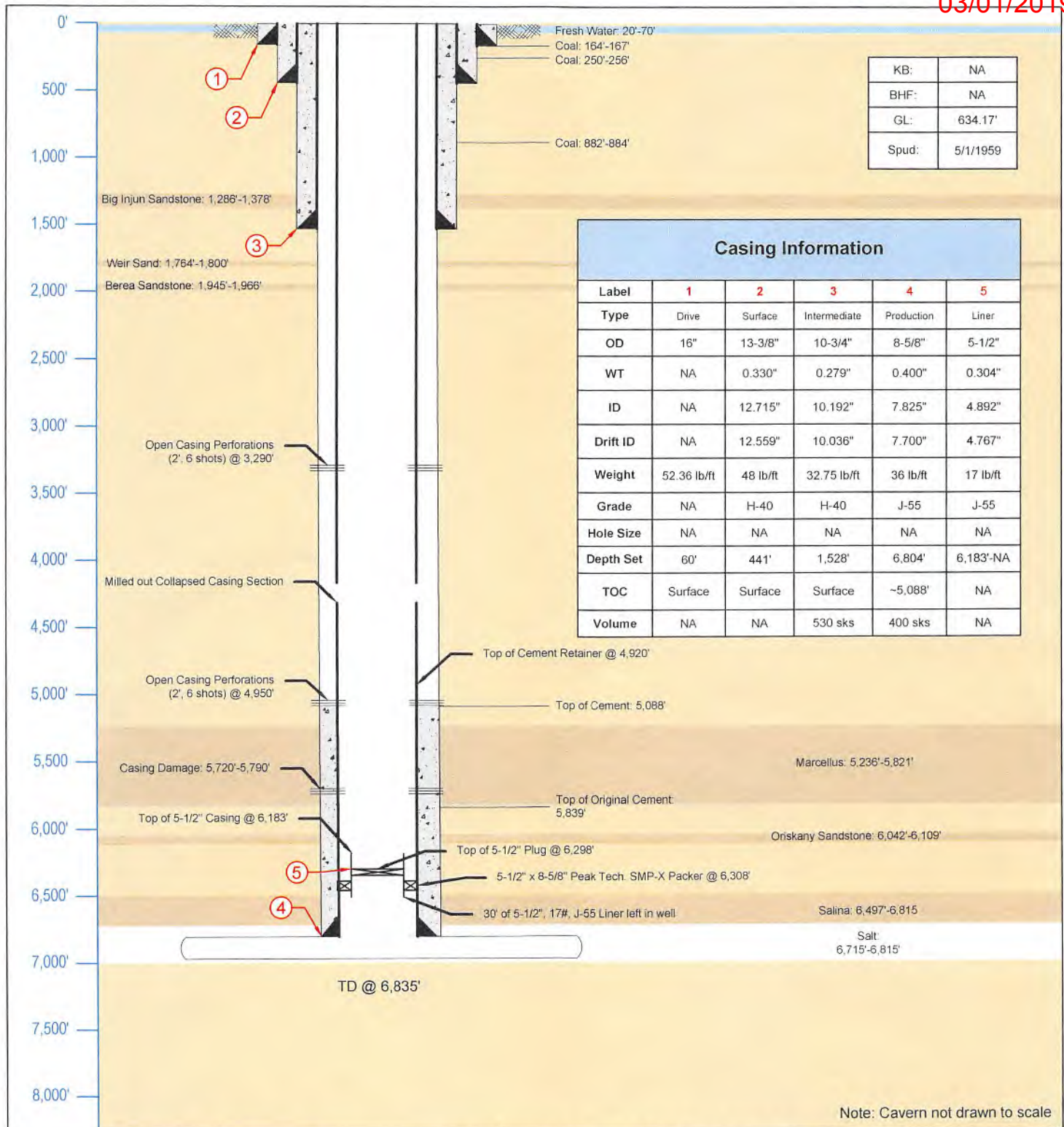
Note: Cavern not drawn to scale

	Eagle Natrium LLC		#9 Brine Well - Proposed P&A Schematic	
	Country: USA	State/Province: West Virginia	County/Parish: Marshall (51)	
District: Franklin (03)	Quadrangle: New Martinsville (509)	Survey/STR: NA		
API No: 47-051-0313	Field: Marshall County	Well Type/Status: NA		
Texas License F-9147	Permit No: NA	Project No: F1391	Date: 07/17/18	
3345 Bee Cave Road, Suite 201 Austin, Texas 78746 Tel: 512.732.9812 Fax: 512.732.9816	Drawn: CJG	Reviewed: JRW	Approved: JRW	
	Rev No:	Notes:		

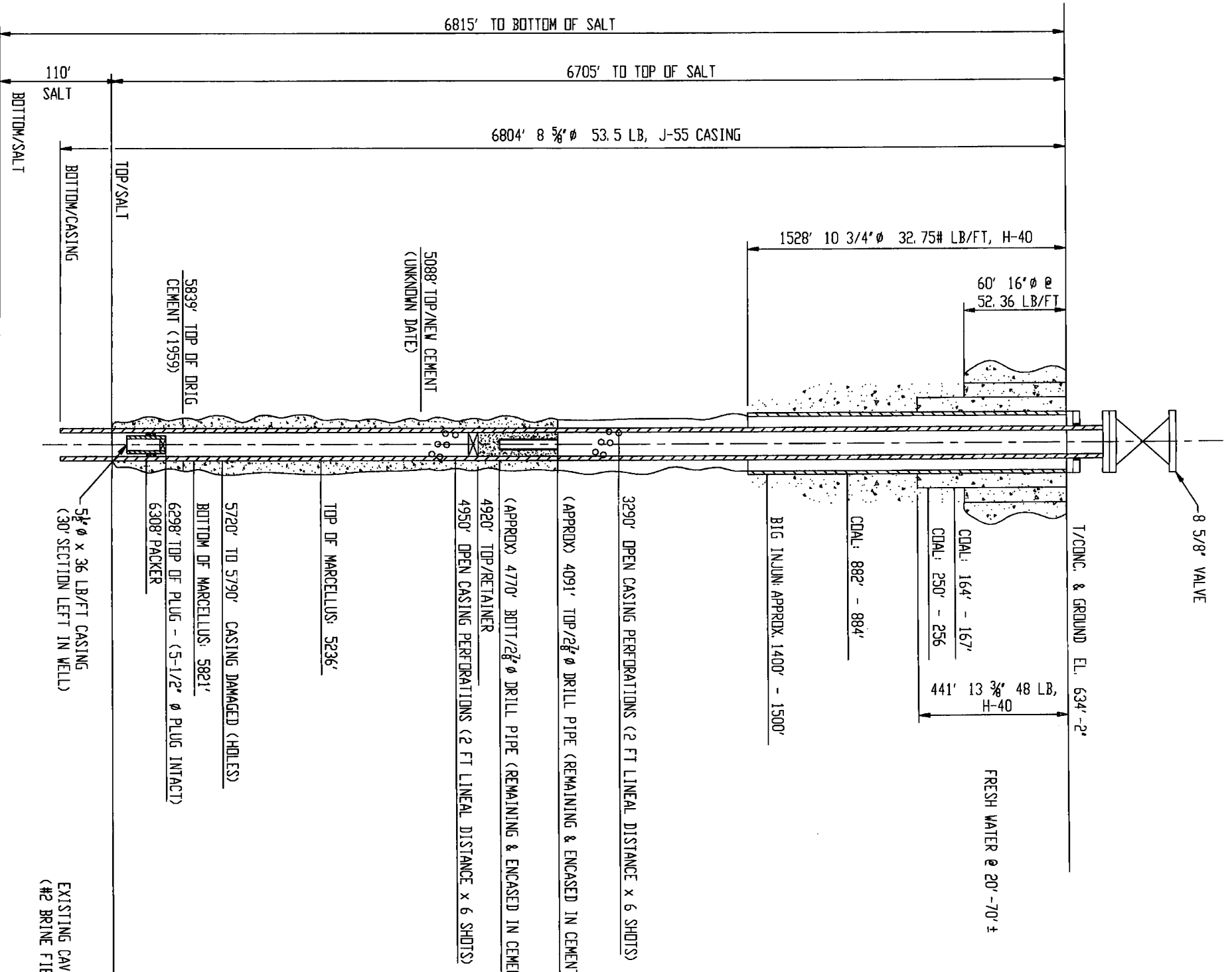


Note: Cavern not drawn to scale

<p>3345 Bee Cave Road, Suite 201 Austin, Texas 78746 Tel: 512.732.9812 Fax: 512.732.9816</p>	Eagle Natrium LLC		#9 Brine Well - Proposed P&A Schematic	
	Country: USA		State/Province: West Virginia	County/Parish: Marshall (51)
	District: Franklin (03)		Quadrangle: New Martinsville (509)	Survey/STR: NA
	API No: 47-051-0313		Field: Marshall County	Well Type/Status: NA
	Texas License F-9147		Permit No: NA	Project No: F1391
Drawn: C.J.G		Reviewed: JRW	Approved: JRW	
Rev No:		Notes:		



 <p>AUSTIN HOUSTON WICHITA CALGARY</p>	Eagle Natrium LLC		#9 Brine Well - Proposed Schematic after Drilling Out Stuck Pipe/Cement	
	Country: USA	State/Province: West Virginia	County/Parish: Marshall (51)	
	District: Franklin (03)	Quadrangle: New Martinsville (509)	Survey/STR: NA	
	API No: 47-051-0313	Field: Marshall County	Well Type/Status: NA	
	Texas License F-9147	Permit No: NA	Project No: F1391	Date: 07/17/18
3345 Bee Cave Road, Suite 201 Austin, Texas 78746 Tel: 512.732.9812 Fax: 512.732.9816	Drawn: CJG	Reviewed: JRW	Approved: JRW	<p>RECEIVED Office of Oil and Gas NOV 16 2018 WV Department of Environmental Protection</p>
Rev No:	Notes:			



8 5/8" VALVE

T/CONG. & GROUND EL. 634'-2"

FRESH WATER @ 20' - 70' ±

CDAL: 164' - 167'
CDAL: 250' - 256'

441' 13 3/8" 48 LB, H-40

CDAL: 882' - 884'

BIG INJUN: APPROX. 1400' - 1500'

3290' OPEN CASING PERFORATIONS (2 FT LINEAL DISTANCE x 6 SHOTS)

(APPROX) 4091' TOP/2 7/8" DRILL PIPE (REMAINING & ENCASED IN CEMENT)

(APPROX) 4770' BOT/2 7/8" DRILL PIPE (REMAINING & ENCASED IN CEMENT)

4920' TOP/RETAINER

4950' OPEN CASING PERFORATIONS (2 FT LINEAL DISTANCE x 6 SHOTS)

5088' TOP/NEW CEMENT (UNKNOWN DATE)

TOP OF MARCELLUS: 5236'

5720' TD 5790' CASING DAMAGED (HOLES)

BOTTOM OF MARCELLUS: 5821'

6298' TOP OF PLUG - (5-1/2" DRILL PIPE INTACT)

6308' PACKER

5839' TOP OF ORIG CEMENT (1959)

TOP/SALT

5 1/2" DRILL PIPE x 36 LB/FT CASING (30' SECTION LEFT IN WELL)

EXISTING CAVE (#2 BRINE FIE)

6815' TO BOTTOM OF SALT

6705' TO TOP OF SALT

6804' 8 5/8" DRILL PIPE 53.5 LB, J-55 CASING

110' SALT

BOTTOM/SALT

BOTTOM/CASING

47-051-00313 P

N WELL)

IN WELL)

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- NOTES:
- a.) ORIGINAL DRILL DATE : MAY 1959
 - b.) FIELD MODIFICATIONS DONE IN 02/21/2014.
 - c.) SEE SK-40919 FOR ORIGINAL LOG/CROSS SECTION.

REV.	DATE	DESCRIPTION
4	7/05/16	REVISED WATER LEVEL
3	12/31/15	ADD AP1 # 47-051-0313
2	8/17/15	AS-BUILT CEMENT OUTSIDE 8-5/8" CASING
1	2/18/15	ADDED LITHOLOGY
0	08/20/14	CAD DRANN W/AS BUILT CHANGES IN 2/21/2014.

DEPT: 70 - BRINE	
TITLE: #9 BRINE WELL (AP1 # 47-051-0313)	
ELEVATION / CROSS SECTION - REDRANN AUG 2014	
DRAWING TYPE: MECHANICAL PROCESS EQUIPMENT NPE	
EQUIPMENT No: 7000-115-0009	
DRANN	M. HUSARIK DATE 08/25/14
CHECKED	S. CLARK DATE 08/25/14
APP'VD	E. McLAUGHLIN DATE 08/26/14
SCALE: NONE	ACAD YES
JOB No P-XXX-G	
DWG 70-2646	REV 4



NATRIUM

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-051-0313 W County Marshall District Franklin
Quad New Martinsville, WV Pad Name N/A Field/Pool Name N/A
Farm name Axiall Corp. Well Number No. 9 Injection
Operator (as registered with the OOG) Eagle Natrium LLC/Axiall Corp.
Address N. St. Rt. 2, City New Martinsville State WV Zip 26155

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing _____ Easting _____
Landing Point of Curve Northing _____ Easting _____
Bottom Hole Northing _____ Easting _____

Elevation (ft) _____ GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other Water Injection
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Brine Water mixed with 2%KCL

Date permit issued 12/16/2013 Date drilling commenced 1/2/2014 Date drilling ceased 2/21/2014
Date completion activities began N/A Date completion activities ceased N/A
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 50' Open mine(s) (Y/N) depths N/A
Salt water depth(s) ft 1050'-1750' Void(s) encountered (Y/N) depths N/A
Coal depth(s) ft 256' - 261' Cavern(s) encountered (Y/N) depths N/A
Is coal being mined in area (Y/N) N

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Reviewed by:

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Ju

WR-35
Rev. 8/23/13

API 47-051 - 0313 W Farm name Axiall Corp. Well number No. 9 Injection

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor		16"	60'				
Surface							
Coal		13 3/8"	441'		H-40 @48.9lb/ft		
Intermediate 1		10 3/4"	1528'		H-40 @ 32.75		
Intermediate 2							
Intermediate 3							
Production		8 5/8"	6804'		J55 @ 36lb/ft		
Tubing		5 1/2"	6264'		J-55 @17lb/ft		
Packer type and depth set		Peak Technology SMP-X 5 1/2" in 8 5/8" set at 6350'					

700 ≈ 5000'

Comment Details Removed 6254' of 5 1/2" liner. Perforations were made in the 8 5/8" Production casing to perform a squeeze job, not for fracing purposes. Perfs. were made at 4950' to 4948', 3290' to 3288'. Cement was squeezed from 4950' to 4271' when the casing collapsed. Repair operation was ceased at that time.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface							
Coal							
Intermediate 1		530 Sacks					
Intermediate 2							
Intermediate 3							
Production		400 Sacks					
Tubing							

Drillers TD (ft) N/A Loggers TD (ft) N/A
 Deepest formation penetrated N/A Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) N/A

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING N/A

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS N/A

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS N/A

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED N/A

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47-051-00313P

03/01/2019

M. L. Cobb

FORM CS-32

COPY
COLUMBIA-SOUTHERN
CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
New Martinsville, W. Va.

May 29, 1959

Oil and Gas Division
State Department of Mines
Charleston, W. Va.

Attention: Mrs. Marie E. Griffith
Assistant Director
Oil and Gas Division

Dear Mrs. Griffith:

Please find attached the original and duplicate of
the well record for Columbia-Southern Chemical Corporation
well No. 9 drilled on State Permit No. MARS-313.

Very truly yours,

COLUMBIA-SOUTHERN CHEMICAL CORP.

C.A.G.

C. A. Giese
Power Engineer

CAO/td

bcc: C. E. Wolf
Engineering - P-113C ✓

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WV Department of
Environmental Protection



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. MAR8-313 Oil or Gas Well Brine
(KIND)

Company Columbia-Southern Chemical Corp.
Address New Martinsville, W. Va.
Farm J. N. Wells Acres 86.86
Location (waters) East Bank Ohio River, Patrimus
Well No. 9 Elev. 632.8
District Franklin County Marshall
The surface of tract is owned in fee by Columbia-Southern Chemical Corp. Address New Martinsville
Mineral rights are owned by Columbia-Southern Chemical Corp. Address New Martinsville
Drilling commenced August 1, 1957
Drilling completed May 7, 1959
Date Shot From To
With
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Cu. Ft.
Rock Pressure lbs. hrs.
Oil bbls., 1st 24 hrs.
Fresh water feet feet
Salt water feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16	62'	62'	Kind of Packer
18	64 3/8'	64 3/8'	
10	1530'	1530'	Size of
8-5/8	680'	680'	
6			Depth set
5 3/16			
8			Perf. top
8			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. Date
COAL WAS ENCOUNTERED AT FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Clay	-	Soft	0	4.1			
Gravel	-	Soft	37	65			
Sand	-	Hard	65	72			
Shale	-	Hard	72	114			
Lime	-	Hard	114	162			
Coal	-	Hard	162	167			
Lime	-	Hard	167	182			
Slate	-	Hard	182	186			
Lime	-	Hard	186	198			
Shale	-	Hard	198	221			
Lime	-	Hard	221	228			
Slate	-	Hard	228	232			
Lime	-	Hard	232	246			
Slate	-	Hard	246	252			
Coal	-	Hard	252	258			Pittsburgh Co
Shale	-	Hard	258	291			
Sand	-	Hard	291	312			
Slate	-	Hard	312	317			
Red Rock	-	Hard	317	322			
Shale	-	Hard	322	346			
Red Rock	-	Hard	346	348			
Slate	-	Hard	348	387			
Sand	-	Hard	387	396			
Red Rock	-	Hard	396	402			
Shale	-	Hard	402	432			
Red Rock	-	Hard	432	452			
Shale	-	Hard	452	497			
Sand	-	Hard	497	528			Cow Run
Shale	-	Hard	528	550			
Red Rock	-	Hard	550	555			
Shale	-	Hard	555	561			
Sand	-	Hard	561	572			
Lime	-	Hard	572	578			
Sand	-	Hard	578	602			
Slate	-	Hard	602	646			
Red Rock	-	Hard	646	651			
Shale	-	Hard	651	669			
Red Rock	-	Hard	669	682			



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

47-051-00313P
03/01/2019

WELL RECORD

Permit No. MARB-313

Oil or Gas Well Brine
(KIND)

Company Columbia-Southern Chemical Corp.
 Address New Martinsville, W. Va.
 Farm J. H. Wells Acres 86.86
 Location (waters) East Bank Ohio River, Natrium
 Well No. 9 Elev. 632.8
 District Franklin County Marshall
 The surface of tract is owned in fee by Columbia-Southern Chemical Corp. Address New Martinsville
 Mineral rights are owned by Columbia-Southern Chemical Corp. Address New Martinsville
 Drilling commenced August 2, 1957
 Drilling completed May 7, 1959
 Date Shot _____ From _____ To _____
 With _____
 Open Flow _____ /10ths Water in _____ Inch
 _____ /10ths Merc. in _____ Inch
 Volume _____ Cu. Ft.
 Rock Pressure _____ lbs. _____ hrs.
 Oil _____ bbls., 1st 24 hrs.
 Fresh water _____ feet _____ feet
 Salt water _____ feet _____ feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
18	62'	62'	Kind of Packer
12	143'	143'	
10	1530'	1530'	Size of
8-5/8	680'	680'	
6			Depth set
5 8/16			
8			Perf. top
2			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED _____ SIZE _____ No. Ft. _____ Date _____
 COAL WAS ENCOUNTERED AT _____ FEET _____ INCHES
 _____ FEET _____ INCHES FEET _____ INCHES
 _____ FEET _____ INCHES FEET _____ INCHES

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Clay	-	Soft	0	4.1			
Gravel	-	Soft	4.1	37			
Sand	-	Hard	37	65			
Shale	-	Hard	65	72			
Lime	-	Hard	72	114			
Coal	-	Hard	114	142			
Lime	-	Hard	142	167			
Slate	-	Hard	167	182			
Lime	-	Hard	182	186			
Shale	-	Hard	186	198			
Lime	-	Hard	198	221			
Slate	-	Hard	221	228			
Lime	-	Hard	228	232			
Slate	-	Hard	232	246			
Coal	-	Hard	246	252			
Shale	-	Hard	252	258			Pittsburgh Co
Sand	-	Hard	258	291			
Slate	-	Hard	291	312			
Red Rock	-	Hard	312	317			
Shale	-	Hard	317	322			
Red Rock	-	Hard	322	346			
Slate	-	Hard	346	348			
Sand	-	Hard	348	387			
Red Rock	-	Hard	387	396			
Shale	-	Hard	396	408			
Red Rock	-	Hard	408	432			
Shale	-	Hard	432	452			
Sand	-	Hard	452	497			
Shale	-	Hard	497	528			Gow Run
Red Rock	-	Hard	528	550			
Shale	-	Hard	550	555			
Sand	-	Hard	555	561			
Lime	-	Hard	561	572			
Sand	-	Hard	572	578			
Slate	-	Hard	578	602			
Red Rock	-	Hard	602	646			
Shale	-	Hard	646	651			
Red Rock	-	Hard	651	669			
Red Rock	-	Hard	669	682			

03/01/2019

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Shale	-	Hard	602	707			
Lime	-	Hard	707	712			
Shale	-	Hard	712	752			
Lime	-	Hard	752	765			
Shale	-	Hard	765	782			
Lime	-	Hard	782	792			
Slate	-	Hard	792	799			
Lime	-	Hard	799	809			
Shale	-	Hard	809	840			
Lime	-	Hard	840	881			
Slate	-	Hard	881	948			
Sand	-	Hard	948	982			
Slate	-	Hard	982	1029			
Sand	-	Hard	1029	1046			
Slate	-	Hard	1046	1111			
Sand	-	Hard	1111	1122			
Shale	-	Hard	1122	1172			
Sand	-	Hard	1172	1211			
Shale	-	Hard	1211	1221			
Sand	-	Hard	1221	1250			
Shale	-	Hard	1250	1277			
Lime	-	Hard	1277	1286			
Slate	-	Hard	1286	1289			
Lime	-	Hard	1289	1327			Big Lime
Sand	-	Hard	1327	1397	Water 1418-1446		Injun Sand
Shale	-	Hard	1397	1605			
Lime	-	Hard	1605	1697			
Slate & Shells	-	Hard	1697	1752			
Sand	-	Hard	1752	1802			
Lime	-	Hard	1802	1851			
Slate & Shells	-	Hard	1851	2286			
Sand	-	Hard	2286	2328			
Slate & Shells	-	Hard	2328	2376			
Sand	-	Hard	2376	2383			
Slate & Shells	-	Hard	2383	2461			
Lime	-	Hard	2461	2546			
Slate & Shells	-	Hard	2546	2898			
Lime	-	Hard	2898	2996			
Slate & Shells	-	Hard	2996	5005			
Lime	-	Hard	5005	6030			Onondaga
Sand	-	Hard	6030	6083			Criskey
Lime	-	Hard	6083	6705			Helderberg
Salt & Lime	-	Hard	6705	6815			
Lime	-	Hard	6815	6820.5			TD 6820.5

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GEOLOGIC DATA FOR COLUMBIA-SOUTHERN CHEMICAL CORPORATION'S
BRINE WELLS - No. 8 & No. 9
FRANKLIN DISTRICT, MARSHALL COUNTY, NATRIUM, WEST VIRGINIA



GRADE: 633'

<u>ERA</u>	<u>SYSTEM</u>	<u>SERIES OR GROUP</u>	<u>FORMATION OR MEMBER</u>	<u>ELEV. _____ WELL NO. 8</u>	<u>ELEV. _____ WELL NO. 9</u>
Genezoic	Quartnary	Recent	(Alluvium)	0- 79	0- 60
Paleozoic				79-T.D.	60-T.D.
	Pennsylvanian			79-1246	60-1250
		Mononghelia		79- 246	60- 256
			Swickley Coal	165- 167	164- 167
			Pittsburgh Coal	240- 246	250- 256
		Conemaugh		246- 780	256- 785
			Ames Lime	478- 481	469- 487
			Saltsburg Sd. (Cow Run)	502- 541	495- 528
			Mahoning Lime	742- 763	735- 753
		Allegheny		780-1051	785-1035
			Upper Freeport Coal	Absent	Absent
			Upper Freeport Lime	795- 806	797- 803
			Lower Freeport Coal	850- ?	845- (Horizon)
			Upper Kittanning Coal	Absent	882- 884
			Lower Kittanning Coal (Horizon)	1010	1023
		Pottsville		1051-1246	1035-1252
			Homewood Sand	1051-1074	1035-1050
			Connoquessing Sand	1107-1120	1109-1115
		Mississippian		1246-1966	1252-1960
		(These are affected by (an (unconformity in (Northern W.Va. & Western (Penna.	(Mauch Chunk (St. Genevie (Greenbrier Lime (Loyalhanna Lime & Sand	1286-1391 1286-1327 1327-1391	1292-1387 1292-1321 1321-1378

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Sheet No. 2 of 2

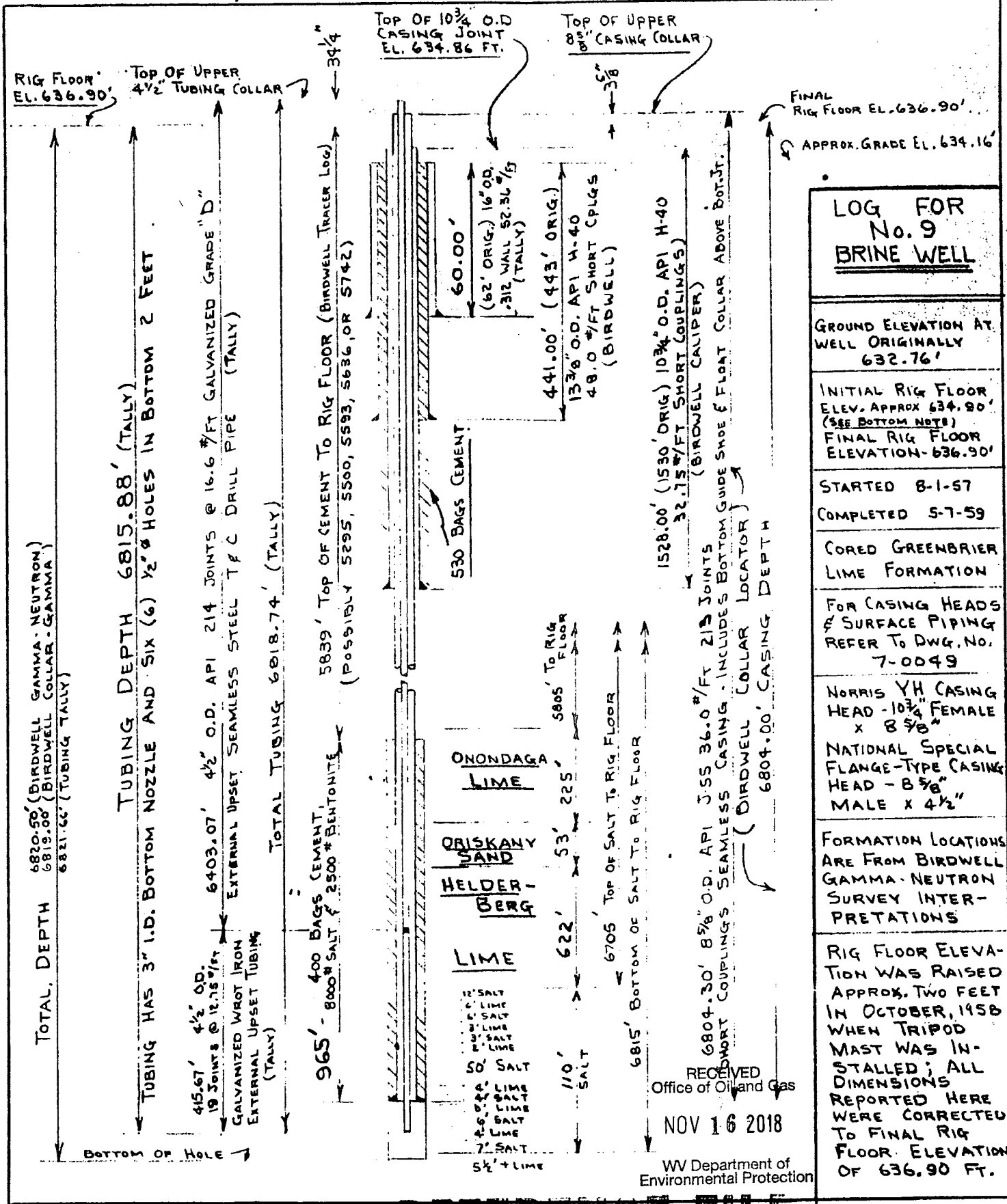


<u>ERA</u>	<u>SYSTEM</u>	<u>SERIES OR GROUP</u>	<u>FORMATION OR MEMBER</u>	<u>ELEV. WELL NO. 8</u>	<u>ELEV. WELL NO. 9</u>
		Burlington		1391-1945	1378-1955
			Pocono Formation	1391-1966	1378-1960
			Weir Sand	1764-1800	1758-1768
			Berea Sand	1945-1966	1955-1960
	Devonian				
		Upper	(Venango-Catshill (Chemung (Portage	1966-2590 ? 2590 ? -	1960-2576 ? 2576 ? -
			(Genesee (Hamilton (Marcellus) (Tioga Bentonite (Onondaga Lime	-4435 ? ? 4435-5245 5245-5818 5815 5818-6042	-4430 ? 4430-5236 ? 5236-5821 5820 5821-6040
		Middle			
		Lower	(Oriskany Sand (Helderburg Lime	6042-6109 6109-6397	6040-6119 6119-6406
	Silurian				
		Cayugan		6397-T.D.	6406-T.D.
			Tonoloway Lime	6397-T.D.	6406-T.D.
			Salina Formation	6397-6497	6406-6507
			Salt	6497-T.D.	6507-T.D.
				6715-6762	6720-6746
				6771-6780	6753-6776
				6785-6814	6780-6810
				T.D.-6818	6816-6826
					6834-6837
					T.D.-6840

03/01/2019

Sheet No. 2 of 2

<u>ERA</u>	<u>SYSTEM</u>	<u>SERIES OR GROUP</u>	<u>FORMATION OR MEMBER</u>	<u>ELEV. WELL NO. 8</u>	<u>ELEV. WELL NO. 9</u>
		Burlington		1391-1945	1378-1955
			Pocono Formation	1391-1966	1378-1960
			Weir Sand	1764-1800	1758-1768
			Berea Sand	1945-1966	1955-1960
	Devonian				
		Upper	(Venango-Catshill (Chemung (Portage	1966-2590 ? 2590 ? -	1960-2576 ? 2576 ? -
			(Genesee (Hamilton (Marcellus) (Tioga Bentonite (Onondaga Lime	-4435 ? ? 4435-5245 5245-5818 5815 5818-6042	-4430 ? 4430-5236 ? 5236-5821 5820 5821-6040
		Middle			
		Lower	(Oriskany Sand (Helderburg Lime	6042-6109 6109-6397	6040-6119 6119-6406
	Silurian				
				6397-T.D.	6406-T.D.
		Cayugan			
			Tonoloway Lime	6397-6497	6406-6507
			Salina Formation	6497-T.D.	6507-T.D.
			Salt	6715-6762	6720-6746
				6771-6780	6753-6776
				6785-6814	6780-6810
				T.D.-6818	6816-6826
					6834-6837
					T.D.-6840

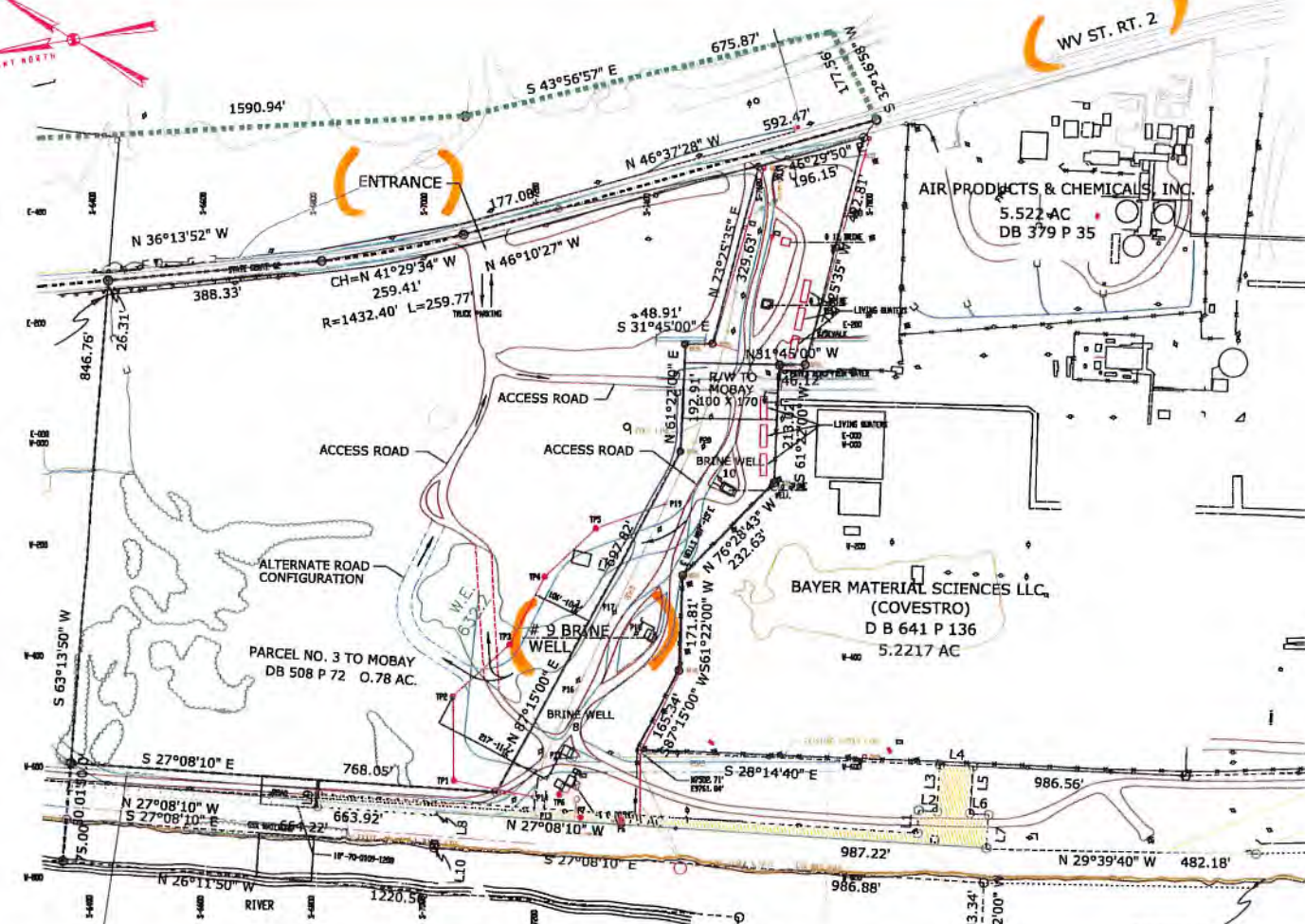


LOG FOR No. 9 BRINE WELL	
GROUND ELEVATION AT WELL ORIGINALLY 632.76'	
INITIAL RIG FLOOR ELEV. APPROX 634.80' (SEE BOTTOM NOTE) FINAL RIG FLOOR ELEVATION - 636.90'	
STARTED	8-1-57
COMPLETED	5-7-59
CORED GREENBRIER LIME FORMATION	
FOR CASING HEADS & SURFACE PIPING REFER TO DWG. NO. 7-0049	
NORRIS YH CASING HEAD - 10 3/4" FEMALE x 8 5/8"	
NATIONAL SPECIAL FLANGE-TYPE CASING HEAD - 8 5/8" MALE x 4 1/2"	
FORMATION LOCATIONS ARE FROM BIRDWELL GAMMA-NEUTRON SURVEY INTERPRETATIONS	
RIG FLOOR ELEVATION WAS RAISED APPROX. TWO FEET IN OCTOBER, 1958 WHEN TRIPOD MAST WAS INSTALLED; ALL DIMENSIONS REPORTED HERE WERE CORRECTED TO FINAL RIG FLOOR ELEVATION OF 636.90 FT.	

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COLUMBIA-SOUTH CAROLINA REFERENCE FILE CORPORATION

DATE 5-25-59
REVISOR
DRAWN E. NICHOLS
CHECKED *lsh*
JOB P-113 C
SUB
SK.40919-G



DEPT: 70 - BRINE	
TITLE: #9 BRINE WELL - PLUG & ABANDON	
TEMPORARY ACCESS ROADS WESTLAKE #2 BRINE FIELD	
DRAWING TYPE: GENERAL ARRANGEMENT	
EQUIPMENT No: 7000-115-0009	
DRAWN MAH	DATE 10/02/18
CHECKED .	DATE .
APP' VJL	DATE .
SCALE 1"=100'	ACAD YES
JOB No .	REV
DWG 70-0369	0

ELEVATION 626.0
SCH. B ITEM 7

REV.	DATE	DESCRIPTION	MAH	CHKD.	
0	10/20/18	FOR PERMIT			
REVISION RECORD					
300 Woodliff Dr. Suite 211 Canonsburg, Pa. 15317 (412) 383-9000					
PROJECT NO.	AREA	DISC.	DOC.	ISSUANCE NUMBER	REVISION NUMBER
655604	0000	46	D3	0000	0

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47-051-00313P



BIRDWELL

Nuclear Log

CA 9 12/22

PITTSBURGH PLATE GLASS Co
COMPANY COLUMBIA SOUTHERN
CHEMICAL DIVISION
CHEMICAL CORP.

WELL (BRINE #9)

FIELD FRANKLIN DIST.

COUNTY MARSHALL STATE W. VA.

LOCATION:
SEC. _____ TWP _____ RGE. _____

OTHER SERVICES
GAMMA
NEUTRON
CALIPER
TRACER

ELEVATIONS:
KB. N.A.
DF. N.A.
GL. N.A.

PERMANENT DATUM GROUND LEVEL ELEV. N.A.
LOG MEASURED FROM TOP OF ~~SHAFT~~ ^{SHAFT} ~~7'~~ ^{7'} ABOVE PERM. DATUM
DRILLING MEASURED FROM TOP OF CASING COLLAR ~~LOW~~

DATE	12-20-61	12-20-61
RUN NO.	3	3
TYPE LOG	NEUTRON	COLLAR LOCATOR
DEPTH - DRILLER	6820'	6820'
DEPTH - LOGGER	6820'	6820'
BOTTOM LOGGED INTERVAL	6827'	6820' } TOOL ON BOTTOM
TOP LOGGED INTERVAL	6600'	6600' } SLACK IN LINE
TYPE FLUID IN HOLE	BRINE	BRINE
SALINITY PPM CL.	N.A.	N.A.
DENSITY LB./GAL.	10	10
LEVEL	FULL	FULL
MAX. REC. TEMP. - DEG. F.	N.A.	N.A.
OPERATING RIG TIME	2 HR.	TOTAL
RECORDED BY	SMITH	SMITH
WITNESSED BY	GIESE	GIESE
LOCATION	CLARKSBURG, W. VA #3	

RUN NO.	BORE HOLE RECORD			CASING RECORD			
	BIT	FROM	TO	SIZE	WGT.	FROM	TO
3	10"	0	T.D.	8 5/8"	36	0	6804
		6804	T.D.	4 1/2"	N.A.	0	F.O.
					16.6		

THIS HEADING AND LOG CONFORM TO API RP-33

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EQUIPMENT DATA

GAMMA RAY				NEUTRON				COLLAR LOCATOR	
RUN NO.				RUN NO.	3				3
TOOL MODEL NO.				LOG TYPE	NG				
DIAMETER				TOOL MODEL NO.	TRACER				509
DETECT. MODEL NO.				DIAMETER	1.5"				1.5"
TYPE				DETECT. MODEL NO.	MG-70				
LENGTH				TYPE	GM				
DIST. TO N. SOURCE				LENGTH	12"				
GENERAL				SOURCE MODEL NO.	M-602				
HOIST TRUCK NO.	246			SERIAL NO.	?				
INST. TRUCK NO.	246			SPACING	?				
TOOL SERIAL NO.				TYPE	BE-PU				
				STRENGTH-N/SEC.	8.06 x 10 ⁶ N/SEC.				

LOGGING DATA

RUN NO.	GENERAL DEPTHS		SPEED FT/MIN	T.C. SEC.	GAMMA RAY			NEUTRON			
	FROM	TO			SENS. SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS. SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
3	6600	6828	10					6	20K		
	6600	6828	20					10	?		

REFERENCE LITERATURE:

BIRDWELL'S GAMMA, NEUTRON, AND CALIPER

REMARKS:

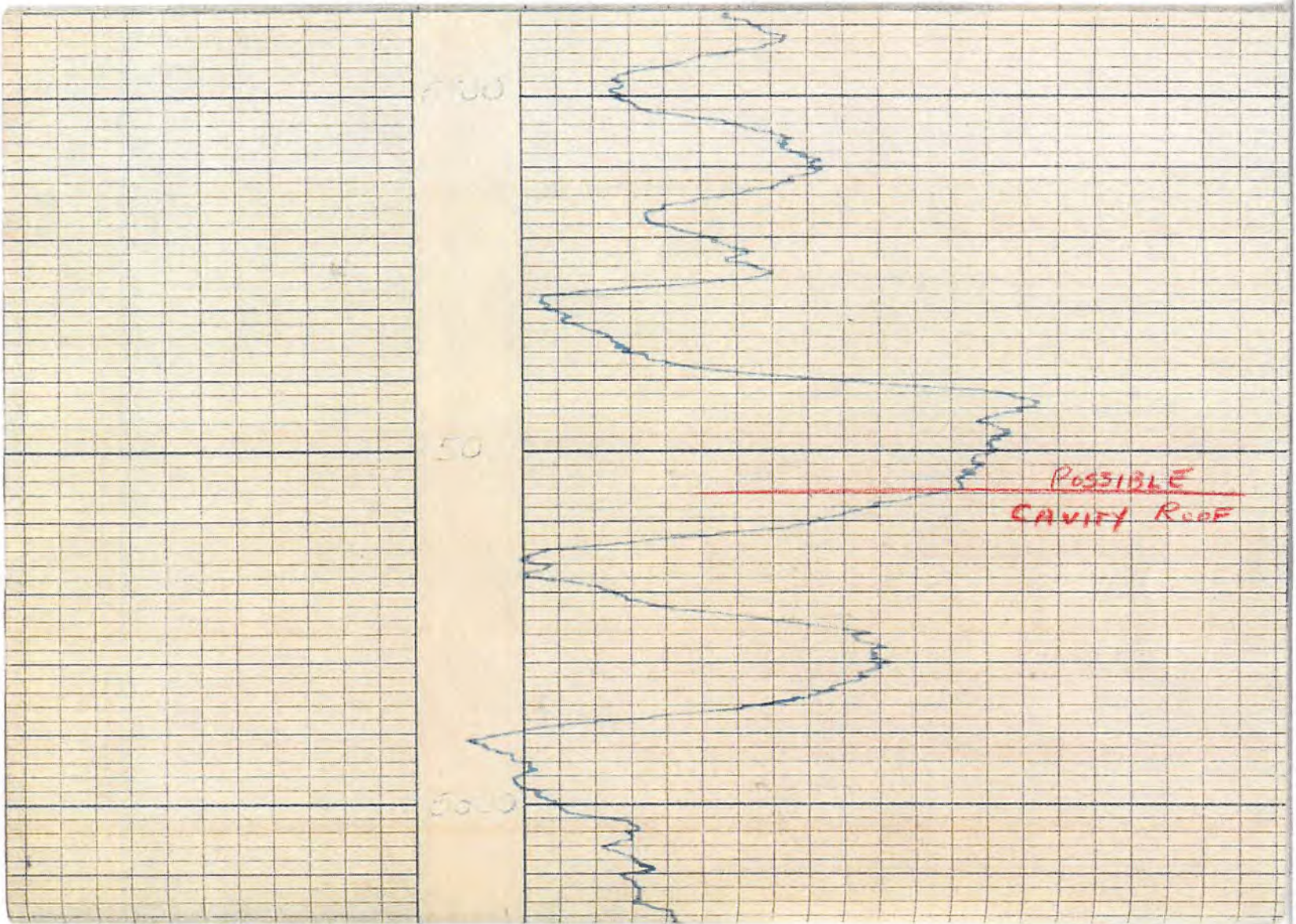
*SURVEY RUN FOR CORRELATION WITH FORMER LOGS
TO LOCATE CAVITY ROOF*

GAMMA RAY

DEPTHS

NEUTRON

47-051-00313P



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7/2/44

D.R. 6823

TOOL ON BOTTOM,
SLACK IN LINE
COULDN'T DETERMINE
BOTTOM PICKUP

SVC TC 10

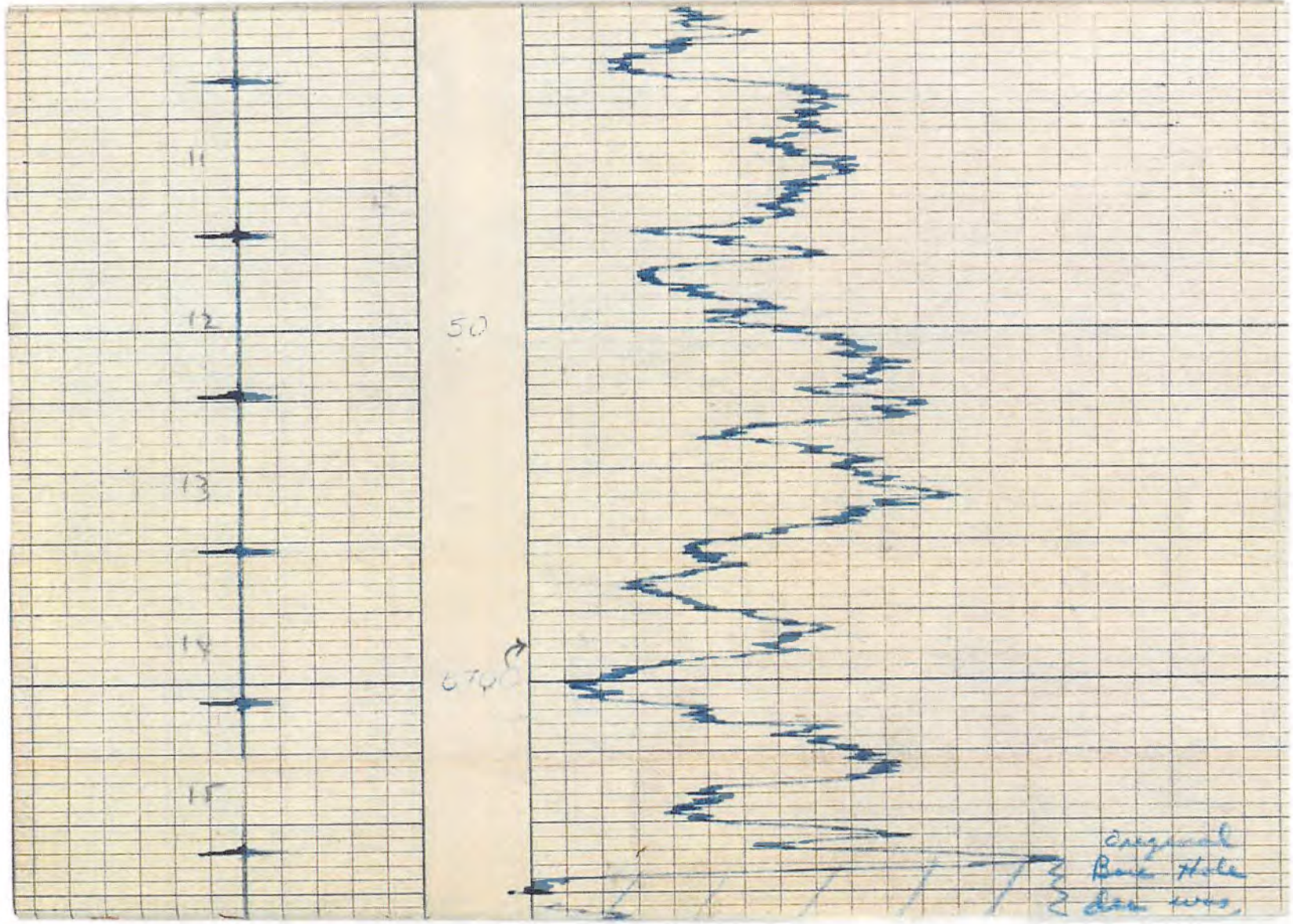


6730'

COLLAR LOG



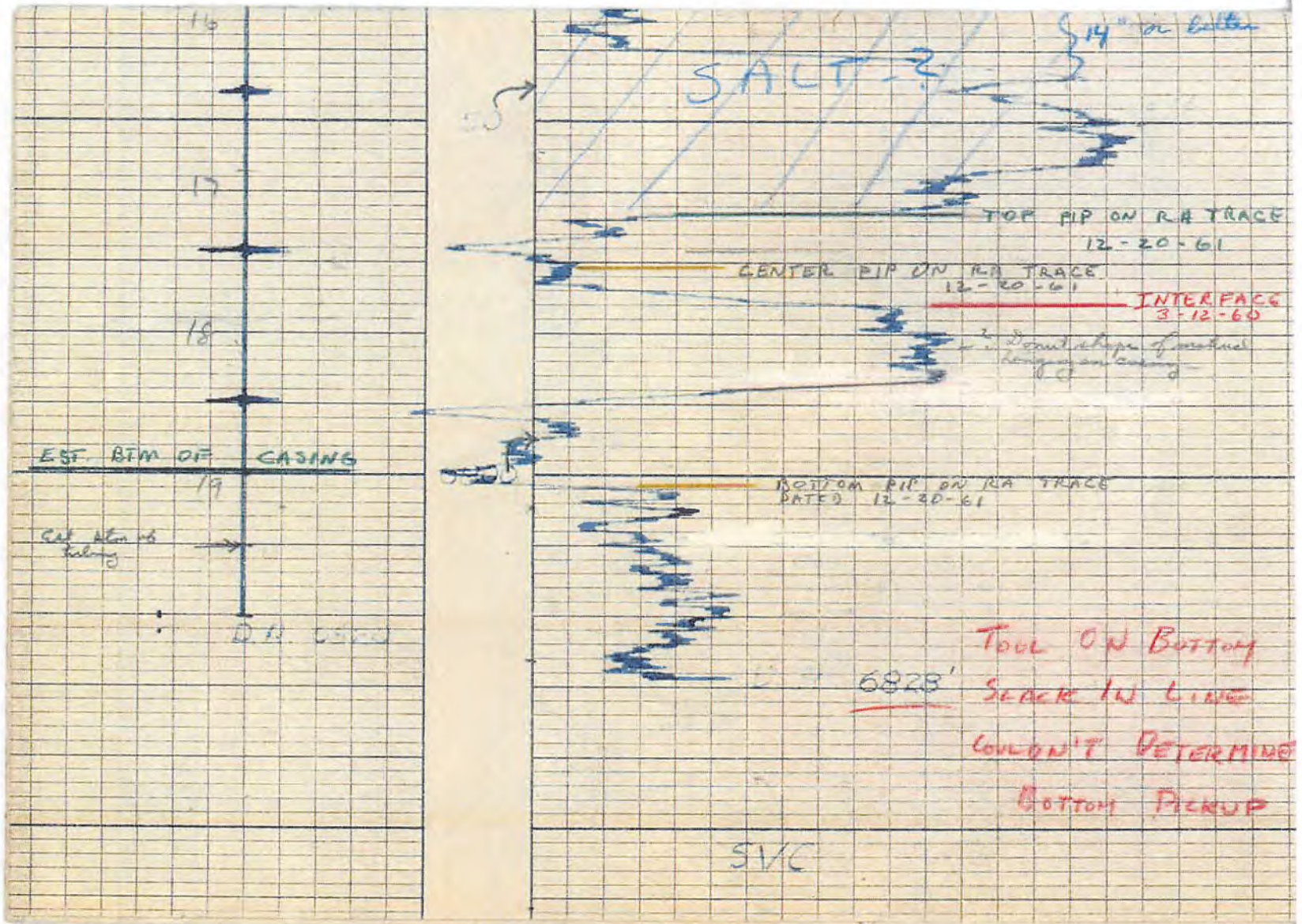
47-051-00313P

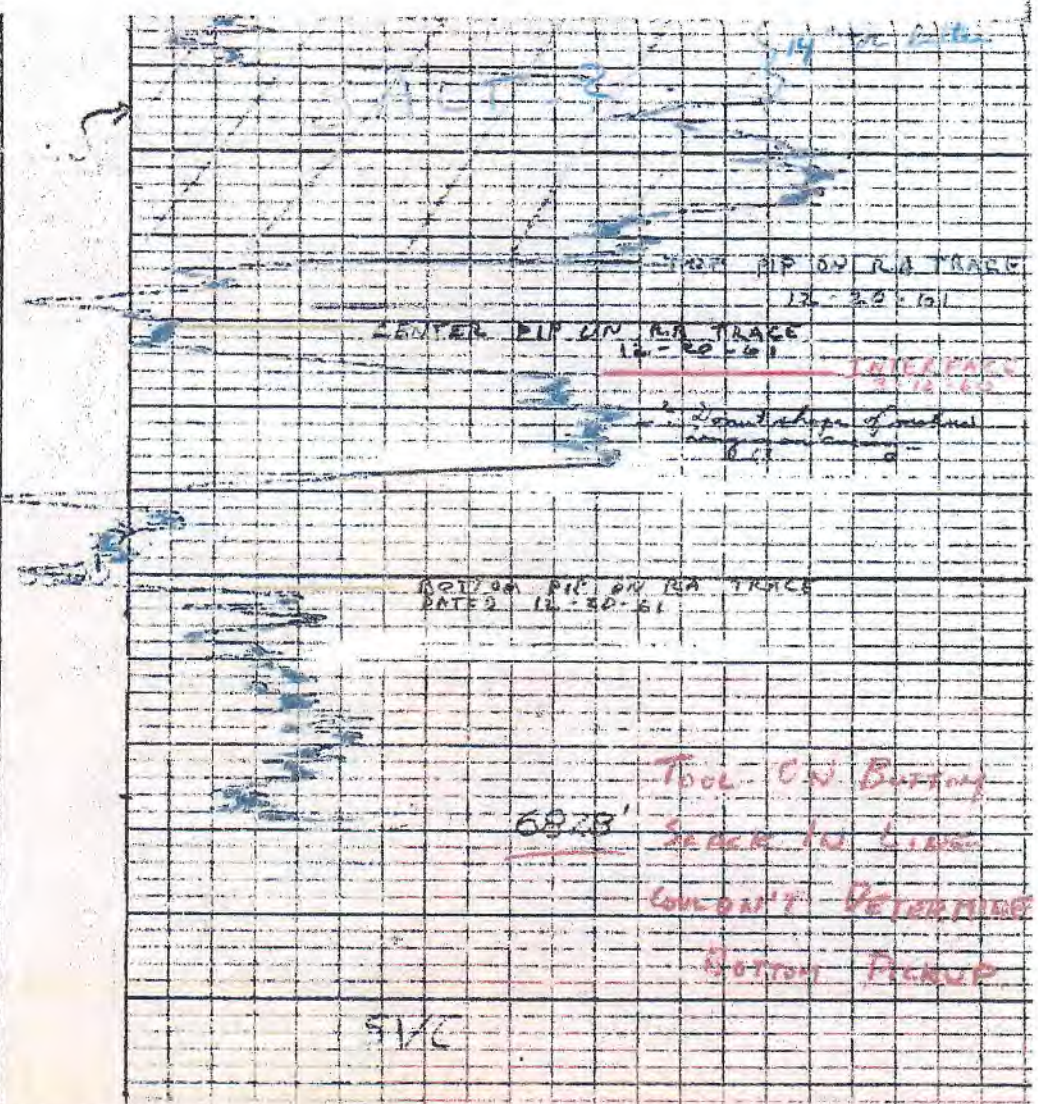
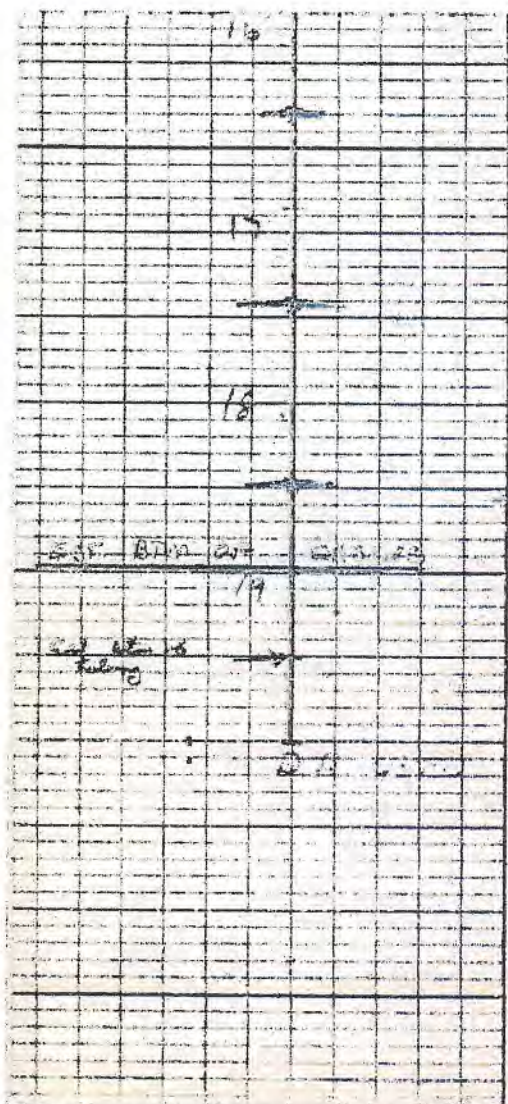


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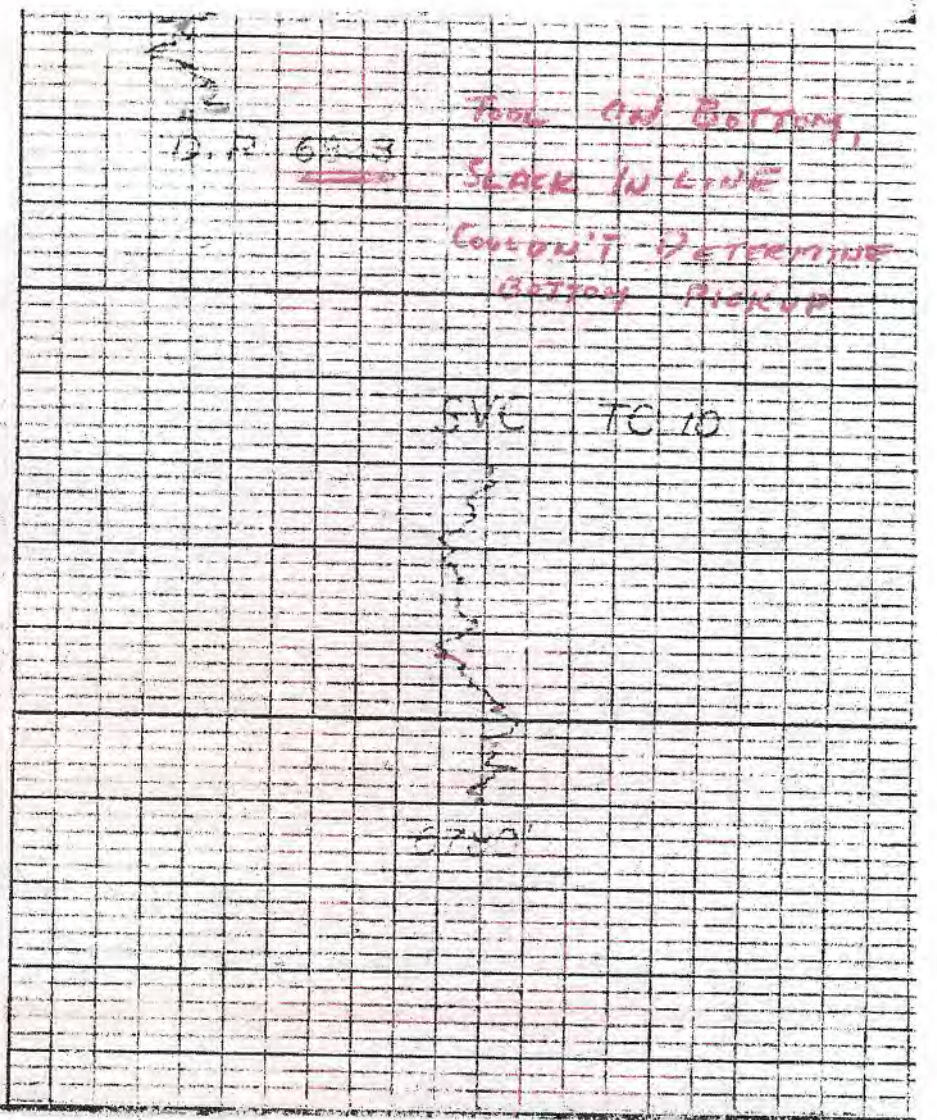
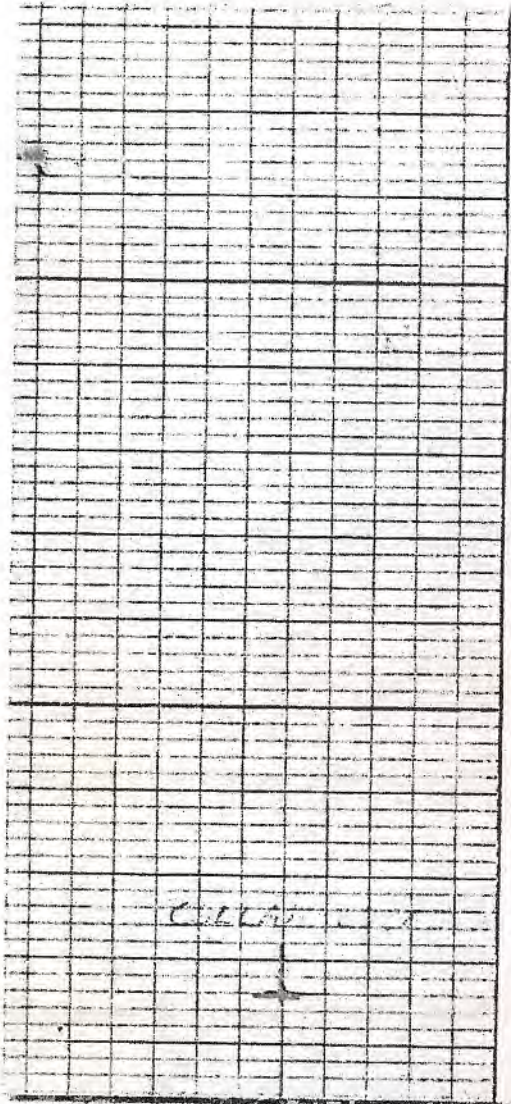
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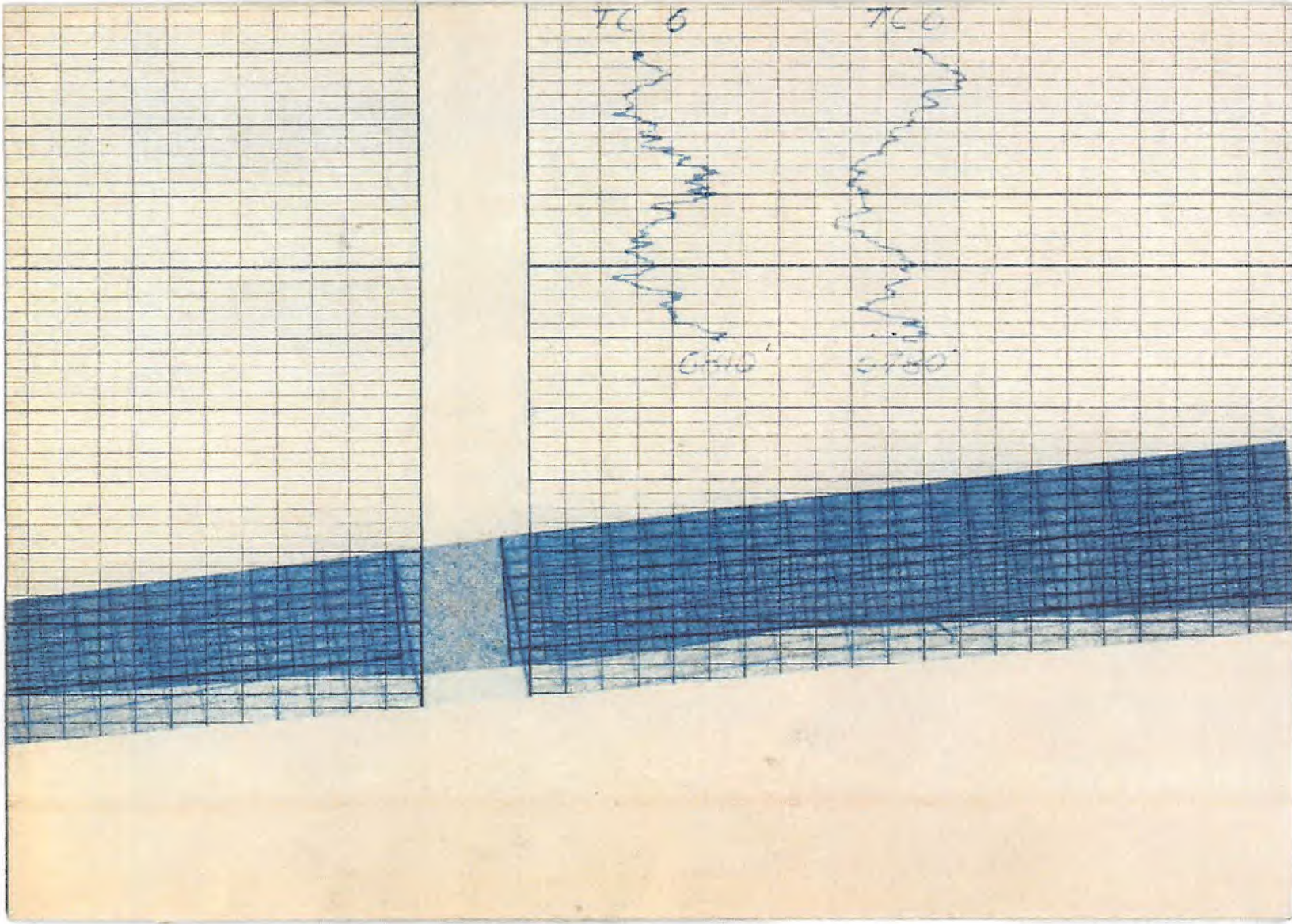


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EQUIPMENT DATA											
GAMMA RAY						NEUTRON			COLLAR LOCATION		
RUN NO.						RUN NO.	3				3
TOOL MODEL NO.						LOG TYPE	NG				
DIAMETER						TOOL MODEL NO.	TRACER				500
DETECT. MODEL NO.						DIAMETER	1.5"				1.5"
TYPE						DETECT. MODEL NO.	MG-70				
LENGTH						TYPE	GM				
DIST. TO N. SOURCE						LENGTH	12"				
GENERAL						SOURCE MODEL NO.	M-602				
HOIST TRUCK NO.	246					SERIAL NO.					
INST. TRUCK NO.	246					SPACING					
TOOL SERIAL NO.						TYPE	BE-PU				
						STRENGTH-N/SEC.	806 x 10 ⁶ N/SEC.				

LOGGING DATA											
GENERAL						GAMMA RAY			NEUTRON		
RUN NO.	DEPTHS		SPEED FT/MIN	T.C. SEC.	SENS. SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS. SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
	FROM	TO									
3	6600	6827	10					6	20K		
	6600	6828	20					10			

REFERENCE LITERATURE:
 BIRDWELL'S GAMMA, NEUTRON, AND CALIBER

REMARKS:
 SURVEY RUN FOR CORRELATION WITH FORMER LOGS
 TO LOCATE CAVITY FLOOR

GAMMA RAY				DEPTHS	NEUTRON			

47-051-00313A

WW-4A
Revised 6-07

1) Date: November 6, 2018
2) Operator's Well Number
No. 9 Brine Well

3) API Well No.: 47 - 051 - 00313

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF APPLICATION TO PLUG AND ABANDON A WELL

4) Surface Owner(s) to be served:	5) (a) Coal Operator
(a) Name <u>Eagle Natrium, LLC</u>	Name <u>N/A</u>
Address <u>P.O. Box 191</u>	Address _____
<u>New Martinsville, WV 26155</u>	_____
(b) Name _____	(b) Coal Owner(s) with Declaration
Address _____	Name <u>N/A</u>
_____	Address _____
(c) Name _____	Name <u>N/A</u>
Address _____	Address _____
_____	_____
6) Inspector <u>James Nicholson</u>	(c) Coal Lessee with Declaration
Address <u>P.O. Box 44</u>	Name <u>N/A</u>
<u>Moundsville, WV 26041</u>	Address _____
Telephone <u>304-552-3874</u>	_____

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

- (1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
- (2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.

Well Operator Eagle Natrium, LLC
 By: J.T. Horan
 Its: Agent
 Address P.O. Box 191
New Martinsville, WV 26155
 Telephone 304-451-3797



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NOV 16 2018

Subscribed and sworn before me this 14th day of November 2018
Karen Sapp Notary Public
 My Commission Expires April 13, 2021
 WV Department of Environmental Protection

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

SURFACE OWNER WAIVER

Operator's Well
Number

No. 9 Brine Well

INSTRUCTIONS TO SURFACE OWNERS NAMED ON PAGE WW4-A

The well operator named on page WW-4A is applying for a permit from the State to plug and abandon a well. (Note: If the surface tract is owned by more than three persons, then these materials were served on you because your name appeared on the Sheriff's tax ticket on the land or because you actually occupy the surface tract. In either case, you may be the only owner who will actually receive these materials.) See Chapter 22 of the West Virginia Code. Well work permits are valid for 24 months. If you do not own any interest in the surface tract, please forward these materials to the true owner immediately if you know who it is. Also, please notify the well operator and the Office of Oil and Gas.

NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.

WHERE TO FILE COMMENTS AND OBTAIN ADDITIONAL INFORMATION:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

Time Limits and methods for filing comments. The law requires these materials to be served on or before the date the operator files his Application. You have **FIVE (5) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Comments must be in writing. Your comments must include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

The Chief has the power to deny or condition a well work permit based on comments on the following grounds:

- 1) The proposed well work will constitute a hazard to the safety of persons.
- 2) The soil erosion and sediment control plan is not adequate or effective;
- 3) Damage would occur to publicly owned lands or resources;
- 4) The proposed well work fails to protect fresh water sources or supplies;
- 5) The applicant has committed a substantial violation of a previous permit or a substantial violation of one or more of the rules promulgated under Chapter 22, and has failed to abate or seek review of the violation...".

If you want a copy of the permit as it is issued or a copy of the order denying the permit, you should request a copy from the Chief.

VOLUNTARY STATEMENT OF NO OBJECTION

I hereby state that I have read the instructions to surface owners and that I have received copies of a Notice and Application For A Permit To Plug And Abandon on Forms WW-4A and WW-4B, and a survey plat.

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

FOR EXECUTION BY A NATURAL PERSON
ETC.

FOR EXECUTION BY A CORPORATION,

	Date		(N/A; Westlake owns surface)
Signature		Name	
		RECEIVED Office of Oil and Gas By Its	Date
		NOV 16 2018	
		Signature	Date

WW-9
(5/16)

API Number 47 - 051 - 00313 (#9 B.W.)
Operator's Well No. _____

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Eagle Natrium, LLC OP Code _____

Watershed (HUC 10) Ohio River Quadrangle New Martinsville, WV

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a pit be used? Yes No

If so, please describe anticipated pit waste: (Run off pond for storm water only and not drilling fluids)

Will a synthetic liner be used in the pit? Yes No If so, what ml.? _____

Proposed Disposal Method For Treated Pit Wastes:

- Land Application (if selected provide a completed form WW-9-GPP)
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain All excess waste to be disposed of at an approved landfill)

Will closed loop system be used? If so, describe: Dewatering system to be utilized during the milling operation

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Brine

-If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used in drilling medium? TBD

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. At an approved landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Cuttings: Short Creek Landfill/ WV 4383-13-3063; Drilling fluids: EnviroTank Clean, Inc./ OH 987000783

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on April 1, 2016, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature J. Thomas Horan

Company Official (Typed Name) J. Thomas Horan

Company Official Title Manager, Environmental

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NOV 16 2018

WV Department of Environmental Protection

Subscribed and sworn before me this 14th day of November, 2018

Karen Sapp Notary Public

My commission expires April 13, 2021



Proposed Revegetation Treatment: Acres Disturbed <2 acres Prevegetation pH _____

Lime _____ Tons/acre or to correct to pH _____

Fertilizer type _____

Fertilizer amount _____ lbs/acre

Mulch _____ Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type lbs/acre

Seed Type lbs/acre

Most disturbed soil to be compacted with stone upon completion

of well work.

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, provide water volume, include dimensions (L, W, D) of the pit, and dimensions (L, W), and area in acres, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Jim Heubler

Comments: Enclosed: Dwg. #70-0369 - Well Location & Access to WV St. Rt. 2

Dwg. #70-2646 - No. 9 Brine Well Present Configuration

No. 9 Brine Well Plat (circa June 2012)

Dwg. #49A-0435: Topographical Map

No. 9 Brine Well Record (circa May 1959); No. 9 Brine Well Geologic Data

Sketch #40919: No. 9 Brine Well Log (circa May 1959); No. 9 Brine Well

Nuclear Log (circa December 1961)

Title: O.I. - Gas Inspector

Date: 11/14/18

Field Reviewed? (2) Yes () No

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WV Department of
Environmental Protection

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
GROUNDWATER PROTECTION PLAN

Operator Name: Eagle Natrium, LLC
Watershed (HUC 10): Ohio River Quad: New Martinsville, WV
Farm Name: _____

1. List the procedures used for the treatment and discharge of fluids. Include a list of all operations that could contaminate the groundwater.

Cuttings from the milling operations will be returned to the surface and disposed of at an approved landfill. Thus, well effluent will not be land applied on site.

2. Describe procedures and equipment used to protect groundwater quality from the list of potential contaminant sources above.

Containment will be provided for all fuel tanks and chemicals.

3. List the closest water body, distance to closest water body, and distance from closest Well Head Protection Area to the discharge area.

The Ohio River is less than a 1/4th mile away.

4. Summarize all activities at your facility that are already regulated for groundwater protection.

The Westlake Natrium Plant is a NPDES regulated facility for discharge into the Ohio River (Permit No. WV 0004359). The Plant is also covered by the WV AST Rule (Registration No. 2014-0002939).

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Environmental Protection

5. Discuss any existing groundwater quality data for your facility or an adjacent property.

The groundwater at the Westlake Natrium Plant is contaminated due to historical operations. The Plant is covered under a Corrective Action Permit (No. WVD 004336343).

6. Provide a statement that no waste material will be used for deicing or fill material on the property.

No waste material will be used for deicing or fill material on the property.

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

Westlake supervision and its well consultant will provide training to well employees (contractors) discussing the requirement to prevent groundwater contamination. The training will include spill containment requirements for oils and fuels.

8. Provide provisions and frequency for inspections of all GPP elements and equipment.

Supervision will be provided during all drilling operations. On-going inspections will be performed to prevent groundwater contamination.

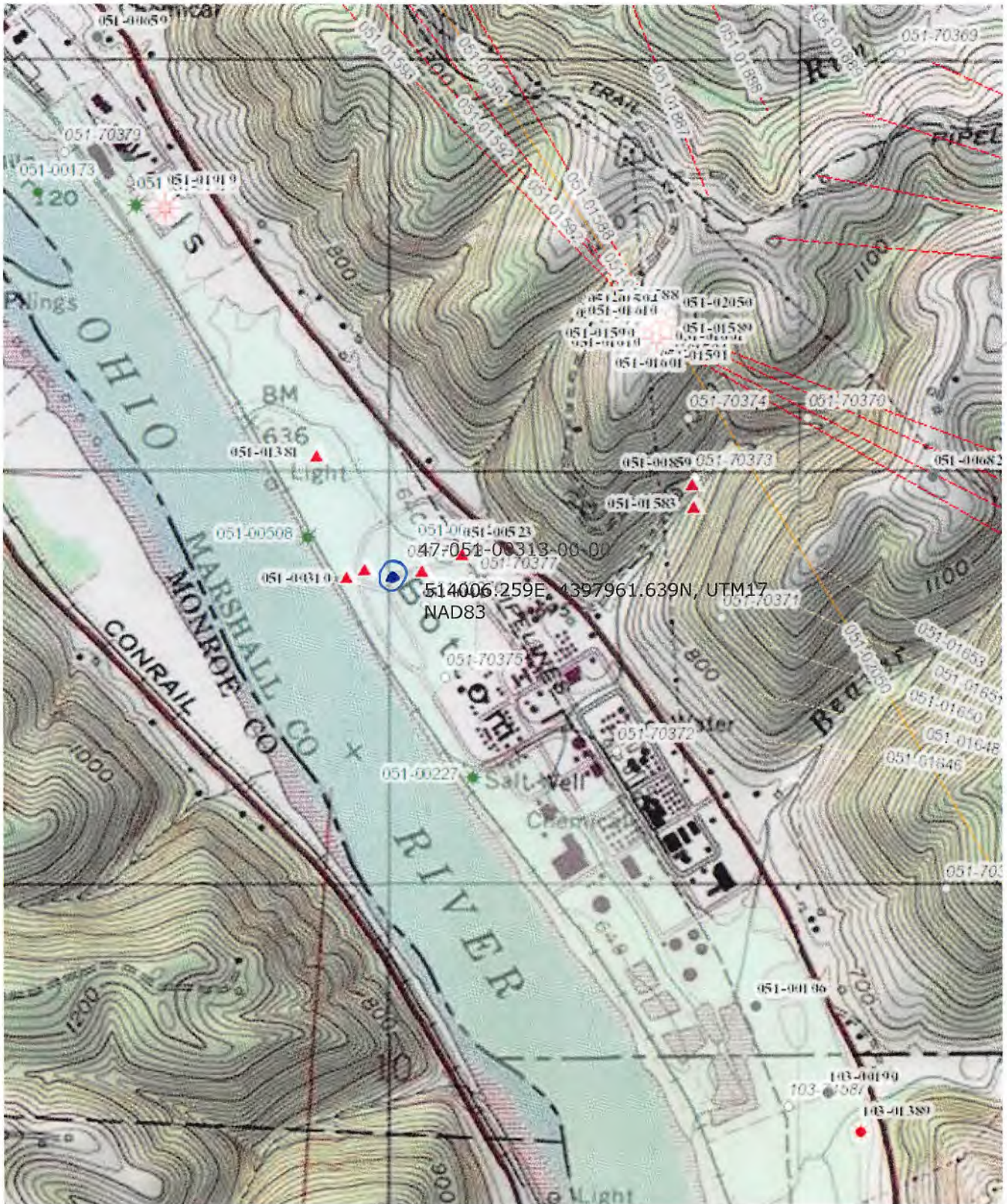
Signature: _____

Date: _____

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Environmental Protection



TRUE N. - N.

8

7

6

5

D

C

B

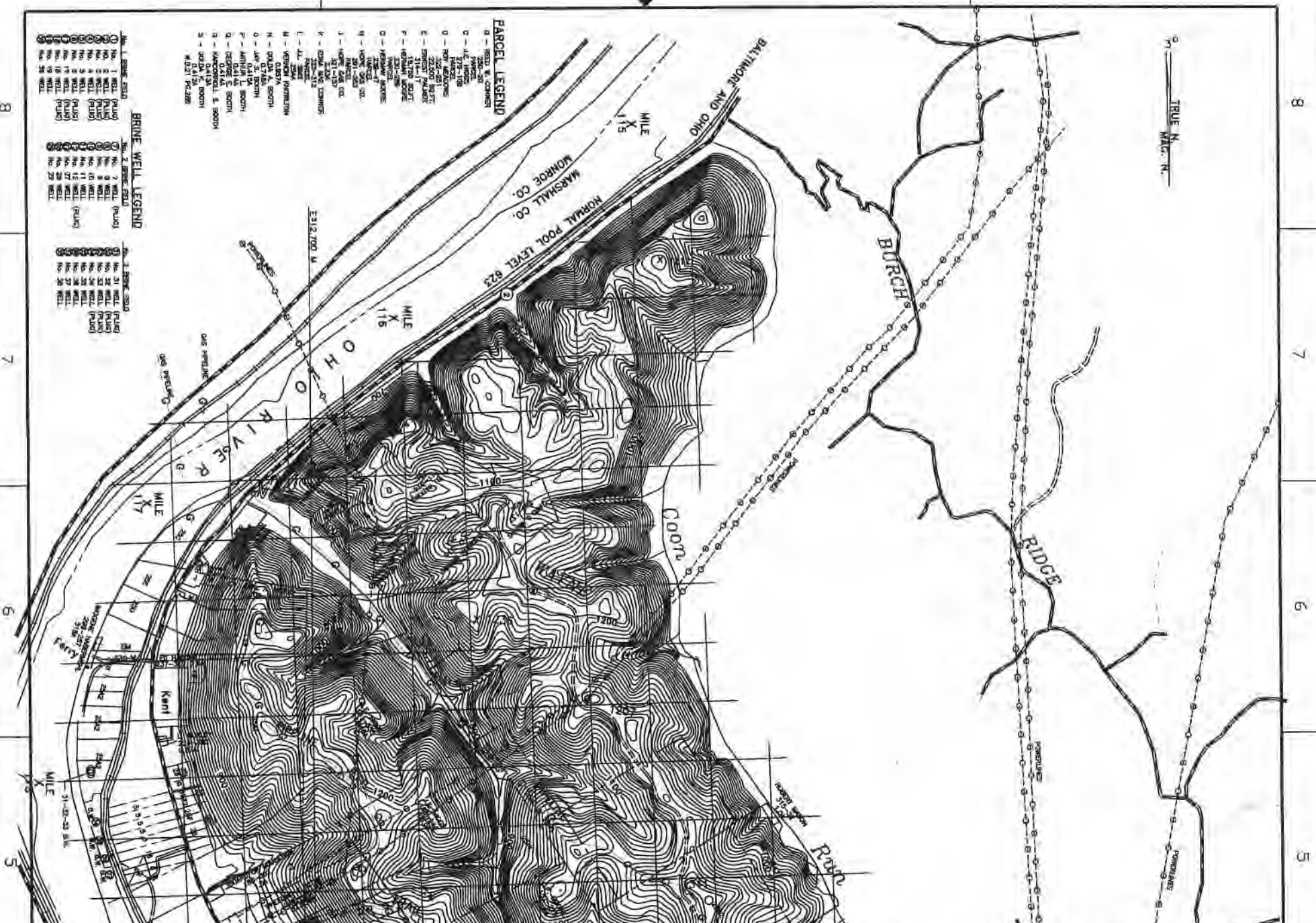
A

PARCEL LEGEND

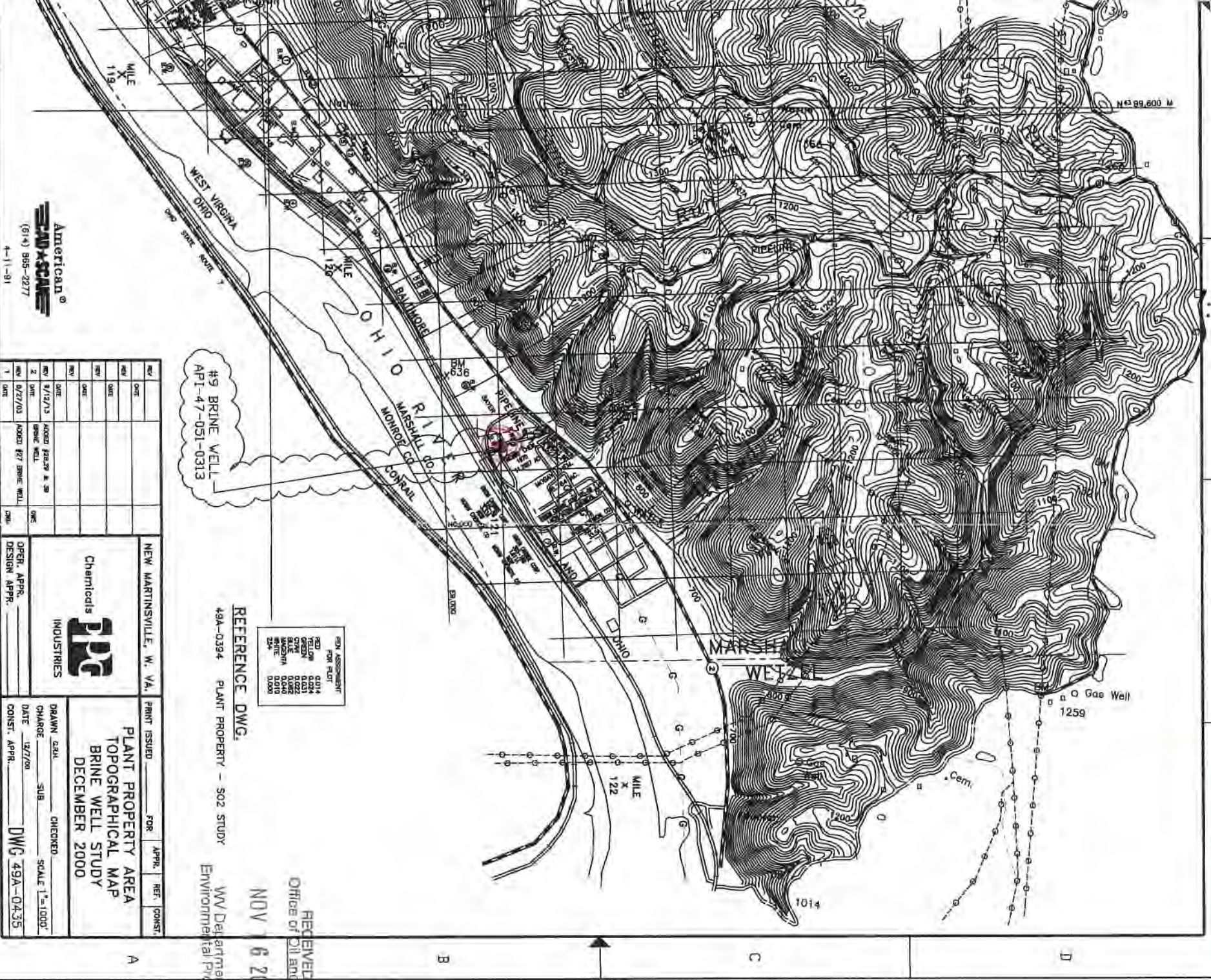
- B - WELLS & CEMENT
- C - WELLS
- D - U.S. HIGHWAYS
- E - RAILROADS
- F - HIGHWAYS
- G - TRACTS
- H - TRACTS
- I - TRACTS
- J - TRACTS
- K - TRACTS
- L - TRACTS
- M - GENERAL INFORMATION
- N - OTHER A. BOOTH
- O - LAND
- P - MOUNTAIN A. BOOTH
- Q - OTHER B. BOOTH
- R - MOUNTAIN B. BOOTH
- S - SOLD

BRINE WELL LEGEND

- No. 1 BRINE WELL
- No. 2 BRINE WELL
- No. 3 BRINE WELL
- No. 4 BRINE WELL
- No. 5 BRINE WELL
- No. 6 BRINE WELL
- No. 7 BRINE WELL
- No. 8 BRINE WELL
- No. 9 BRINE WELL
- No. 10 BRINE WELL
- No. 11 BRINE WELL
- No. 12 BRINE WELL
- No. 13 BRINE WELL
- No. 14 BRINE WELL
- No. 15 BRINE WELL
- No. 16 BRINE WELL
- No. 17 BRINE WELL
- No. 18 BRINE WELL
- No. 19 BRINE WELL
- No. 20 BRINE WELL
- No. 21 BRINE WELL
- No. 22 BRINE WELL
- No. 23 BRINE WELL
- No. 24 BRINE WELL
- No. 25 BRINE WELL
- No. 26 BRINE WELL
- No. 27 BRINE WELL
- No. 28 BRINE WELL
- No. 29 BRINE WELL
- No. 30 BRINE WELL



47-051-00313P



SO2 ASSIGNMENT FOR PLANT	
RED	0.014
YELLOW	0.024
GREEN	0.025
ORANGE	0.026
BLUE	0.027
PURPLE	0.028
BROWN	0.029
BLACK	0.030
WHITE	0.031
GRAY	0.032
PINK	0.033
TEAL	0.034

#9 BRINE WELL
API-47-051-0313

REFERENCE DWG.
49A-0394 PLANT PROPERTY - SO2 STUDY

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WV Department of
Environmental Protection
NOV 6 2018

REV	DATE	DESCRIPTION	BY	CHKD
1	DATE	ADDED EST BRINE WELL		
2	DATE	SPRINK WELLS		
REV	DATE			
REV	DATE			
REV	DATE			
REV	DATE			

NEW MARTINSVILLE, W. VA.

Chemiodis
PPG
INDUSTRIES

OPER. APPR. _____
DESIGN APPR. _____

PRINT ISSUED FOR APPR. REF. CONST.

PLANT PROPERTY AREA
TOPOGRAPHICAL MAP
BRINE WELL STUDY
DECEMBER 2000

DRAWN: SAHL
CHECKED: _____
SCALE: 1"=1000'

DATE: 12/7/00
CHARGE: SUB
DWG: 49A-0435

American
EMASCONE
(614) 855-2277
4-11-01

WW-7
8-30-06



West Virginia Department of Environmental Protection
Office of Oil and Gas
WELL LOCATION FORM: GPS

API: 47-051-00313 WELL NO.: 9 Brine Well

FARM NAME: Eagle Natrium, LLC

RESPONSIBLE PARTY NAME: Eagle Natrium, LLC

COUNTY: Marshall DISTRICT: Franklin

QUADRANGLE: New Martinsville, WV

SURFACE OWNER: Eagle Natrium, LLC

ROYALTY OWNER: Eagle Natrium, LLC

UTM GPS NORTHING: 4,397,961.640

UTM GPS EASTING: 514,006.257 GPS ELEVATION: 634'-0"

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit or assigned API number on the above well. The Office of Oil and Gas will not accept GPS coordinates that do not meet the following requirements:

1. Datum: NAD 1983, Zone: 17 North, Coordinate Units: meters, Altitude: height above mean sea level (MSL) – meters.
2. Accuracy to Datum – 3.05 meters
3. Data Collection Method:

Survey grade GPS : Post Processed Differential _____
Real-Time Differential

Mapping Grade GPS _____ : Post Processed Differential _____
Real-Time Differential _____

4. Letter size copy of the topography map showing the well location.

I the undersigned, hereby certify this data is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Office of Oil and Gas.

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Office of Oil and Gas

NOV 16 2018

WV Department of
Environmental Protection

JT. Horan
Signature

Manager, Environmental
Title

November 6, 2018
Date

EAGLE NATRIUM, LLC
 11.69 AC. ±
 WELL NO. BW 9
 47-051-00313

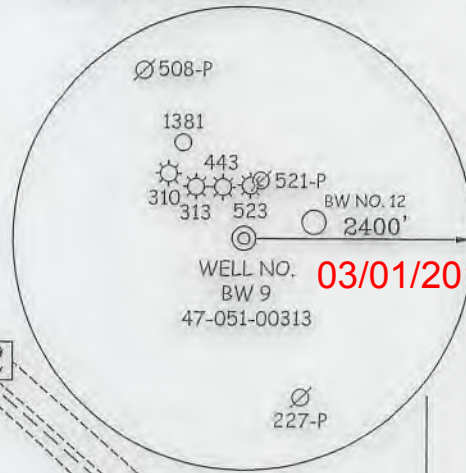
NAD '83 LATITUDE 39°45'00"

WELL NO. BW 9
 STATE PLANE COORDINATES
 NORTH ZONE (NAD '83)

N. 451,318.90
 E. 1,592,619.78

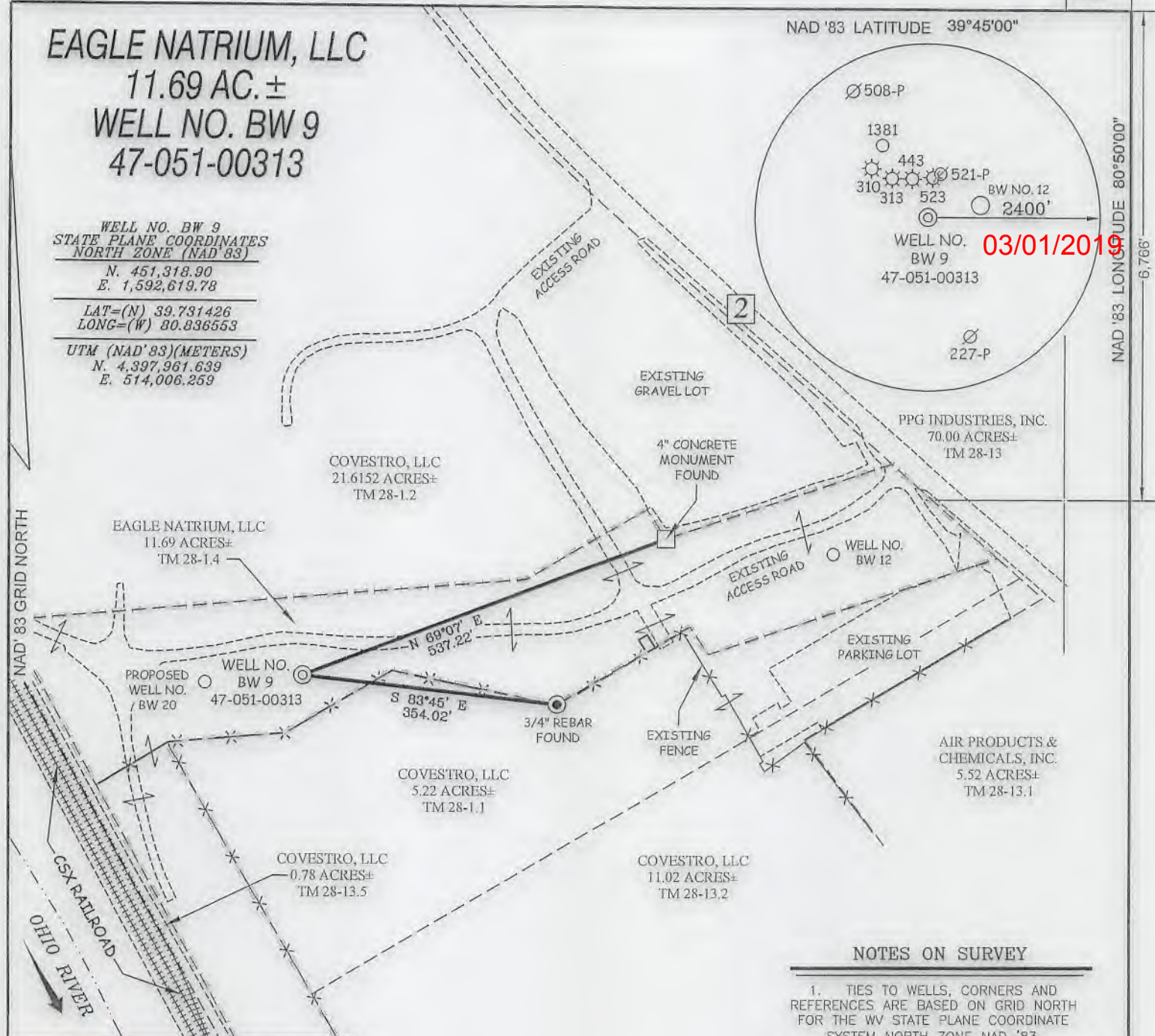
LAT=(N) 39.731426
 LONG=(W) 80.836553

UTM (NAD '83)(METERS)
 N. 4,397,961.639
 E. 514,006.259



NAD '83 LONGITUDE 80°50'00"

NAD '83 GRID NORTH



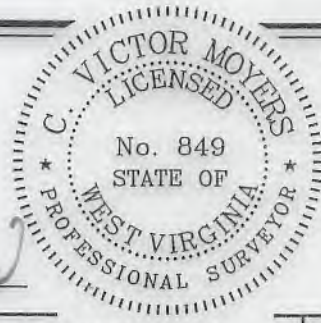
NOTES ON SURVEY

1. TIES TO WELLS, CORNERS AND REFERENCES ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '83.
2. TRACT BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 799 PAGE 387 AND A PREVIOUS SURVEY BY SLS IN 2004 - 2005.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARSHALL COUNTY IN OCTOBER, 2018.
4. WELL LAT./LONG. (NAD'83) ESTABLISHED BY DGPS(SURVEY GRADE).

SLS
 Land & Energy Development
 Solutions from the ground up.
 P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26031 • (304) 462-5634
 www.slsurveys.com

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 849 *C. Victor Moyers*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE NOVEMBER 5, 20 18
 REVISED _____, 20 ____
 OPERATORS WELL NO. BW 9
 API WELL NO. 47 - 051 - 00313
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8874PBW9-PLUG.dwg
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 200'

STATE OF WEST VIRGINIA
 DIVISION OF ENVIRONMENTAL PROTECTION
 OFFICE OF OIL AND GAS



WELL TYPE: OIL _____ GAS _____ INJECTION X WASTE DISPOSAL _____ IF "GAS" PRODUCTION _____ STORAGE _____ DEEP X SHALLOW _____

LOCATION: GROUND ELEVATION 634' WATERSHED OHIO RIVER DISTRICT FRANKLIN COUNTY MARSHALL QUADRANGLE NEW MARTINSVILLE 7.5'

SURFACE OWNER EAGLE NATRIUM, LLC ACREAGE 11.69 ±
 ROYALTY OWNER EAGLE NATRIUM, LLC ACREAGE _____

PROPOSED WORK: LEASE NO. _____
 DRILL _____ CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE _____ PLUG OFF OLD FORMATION _____ PERFORATE NEW FORMATION _____ PLUG AND ABANDON X CLEAN OUT AND REPLUG _____ OTHER _____
 PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION SALINA ESTIMATED DEPTH _____

WELL OPERATOR EAGLE NATRIUM, LLC DESIGNATED AGENT J. THOMAS HORAN
 ADDRESS P.O. BOX 191 ADDRESS P.O. BOX 191
NEW MARTINSVILLE, WV 26155 NEW MARTINSVILLE, WV 26155

COUNTY NAME PERMIT