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Casey V. Saunders
Manager Coal/Gas Coordination

February 22, 2021

Mr. Richard A. Wagner, P.E.
Director, Bureau of Mine Safety
DEP New Stanton District Office
132 Broadview Road
New Stanton, Pennsylvania 15672

Re: Stockdale Well
Proposed Leatherwood Gas Well
Harvey Mine ID 36-10045
4-A Section

Dear Mr. Wagner:

The Harvey Mine submits the plan for Leatherwood, LLC (a CONSOL subsidiary) to drill a conventional gas well in a chain pillar of the 4-A gate section in the Harvey Mine. The proposed well will have its own well pad and be located within a substantial pillar in the 4-A gate section. The proposed gas well is located in a mined-out area that will eventually be sealed using 120 psi seals. Leatherwood will be submitting for a necessary drilling permit for the well from the PADEP and this plan is contingent on Leatherwood receiving it.

The attached mine pillar location drawing shows the as-mined pillar dimensions, and elevation for the proposed well. A general location map is also included to see where the proposed well is located within the "A" longwall district.

This plan applies to the time period commencing when drilling starts until the time that cementing of the coal protection casing is completed unless specifically stated otherwise.

Leatherwood and Consol Pennsylvania Coal Company (CPCC) agree to abide by drilling procedures listed below:

1. The proposed gas well will be approximately a nine-inch (9") diameter well bore that will pass through the Pittsburgh coal seam at a depth between 1,025' and 1,033' feet (elevation of 217 feet for the bottom of the coal seam). The proposed well will be lined with steel casing as indicated on the attached pipe schedule once the hole reaches the appropriate depth shown on the attached hole/pipe schedule.
2. The Surface Coordinates for the proposed well is shown on the attached drawings. This plan is for one (1) proposed well for the pad. No other wells will be drilled without subsequent authorization.
3. The CPCC's surface surveying contractor will provide survey control for Leatherwood to set up over the proposed well bore location. CPCC's surface surveying contractor will verify that the drill rig is set up over the correct coordinate, and provide the Northing, Easting, and elevation of the reference datum to ascertain the approximate depth to the top and bottom of the

Pittsburgh coal seam. Accurate mine floor elevations will be used to calculate the actual depth to the coal seam.

4. Once the surveyed location is verified, MSHA and the PA State Bureau of Mine Safety will be notified at least 48 hours prior to drilling. Leatherwood will proceed with drilling the well to a depth of 30 feet above the top of the coal seam. After drilling has stopped 30 feet above the top of the coal seam, a well deviation survey will be conducted with gyro readings within 100 feet of the top of coal by an independent, qualified well service provider who will determine the approximate location of the bottom of the well bore. A copy of this survey will be maintained and made available for inspection.
5. The total well deviation shall not be closer than 40' to the edge of the coal pillar. If the deviation survey confirms that the well deviation is projected to not be closer than 40' to the edge of the coal pillar, drill through procedures may continue.
6. If the well bore was closer than 40 feet from the edge of the coal pillar or if Leatherwood elects to abandon the well, Leatherwood shall grout the well boring completely, using approved procedures to assure a uniform and complete sealing of the open well bore in accordance with applicable requirements.
7. The Harvey Mine will be evacuated while Leatherwood drills from 30 feet above the top of the coal to 10 feet below the base of the coal. If the well is projected to be more than 40 feet from the edge of the pillar, and before drilling is to resume down to, and through the Pittsburgh Coal, The General Mine Foreman for the Harvey Mine, or its designee, will notify Leatherwood that all persons are out of the Mine. Once official notification is received that all persons are out of the Mine, only then, will Leatherwood resume drilling down to, and through the Pittsburgh coal seam to a point at least 10 feet below the bottom of coal elevation. If circulation of drilling fluids is lost at any time during the drilling process from 30 feet above to 10 feet below the coal, drilling will cease, and the hole will be grouted completely from the bottom of the well boring to the surface. The maintenance of drilling fluids and return of cuttings to the surface will serve to verify the drilled wellbore penetrated through the solid coal barrier and is not connected to the mine void.
8. If a rig break down occurs, or other factors prevent drilling while drilling between 30 feet above the coal seam to 10 feet below the coal seam, drilling activities will cease. At this time, the Harvey Mine can re-enter the mine until it is determined that drilling can resume in this zone. Before drilling operations resumes, the Harvey Mine will be evacuated and Leatherwood must receive notification from the Harvey Mine Foremen or its designee that all persons are out of the mine.
9. A CPCC qualified person will monitor the drilling from the surface until the cementing of the coal protection casing is complete. A CPCC qualified person will be on site when Leatherwood is drilling from 30 feet above the coal seam until the well bore is 10 feet below the coal seam. Methane checks will be made no longer than every 20 minutes by a qualified person within 5 feet of the borehole until drilling reaches 10 feet below the coal seam. If a 1% methane concentration or higher is detected, the CPCC qualified person will notify Leatherwood and the Harvey Mine. Harvey will then notify MSHA and the PA State Mine Inspector of the event. If Leatherwood determines that it has a well integrity issue, then it will correct the issue or plug the well.
10. Leatherwood will drill with a water based approved drilling fluid from the surface casing through the Pittsburgh coal seam until the coal protection casing is effectively installed and cemented to

the surface, in accordance with all approvals, State, and federal regulations. The fluid will be constantly circulated while drilling. The hole will be monitored, and a loss of circulation will indicate if a mine void has been intersected.

11. Leatherwood will continue to drill to the approximate depths shown on the schedule submitted (attached). Leatherwood will run pipe and continue drilling operations / activities to the gas bearing strata below the Pittsburgh coal seam in accordance with all applicable laws and regulations. Leatherwood will continuously monitor for potentially explosive gases. Leatherwood shall immediately notify CPCC, and CPCC will immediately notify MSHA and the PADEP Bureau of Mine Safety in the event that there is any indication of loss of circulation during drilling operations.

If there are any questions, or additional information is required, please call.

Sincerely,

Leatherwood LLC Representative:

Name (Printed): Casey V. Sanders (Assistant VP - Leatherwood)

Signature: Casey V. Sanders

Date: 3-8-2021

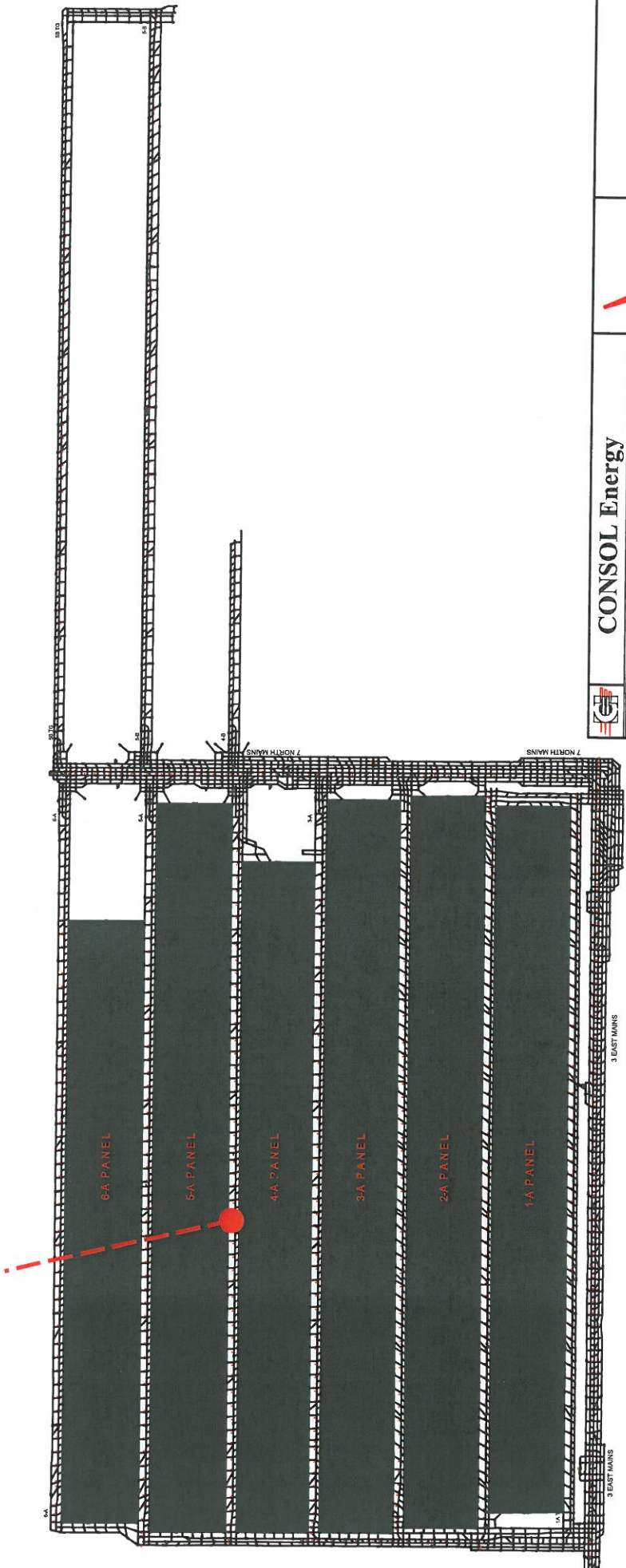
Harvey Mine Representative:

Name (Printed): Patrick Todd McNaair

Signature: Patrick Todd McNaair

Date: 3-8-2021

Stockdale Well



CONSOL Energy

PA Operations

Harvey Mine

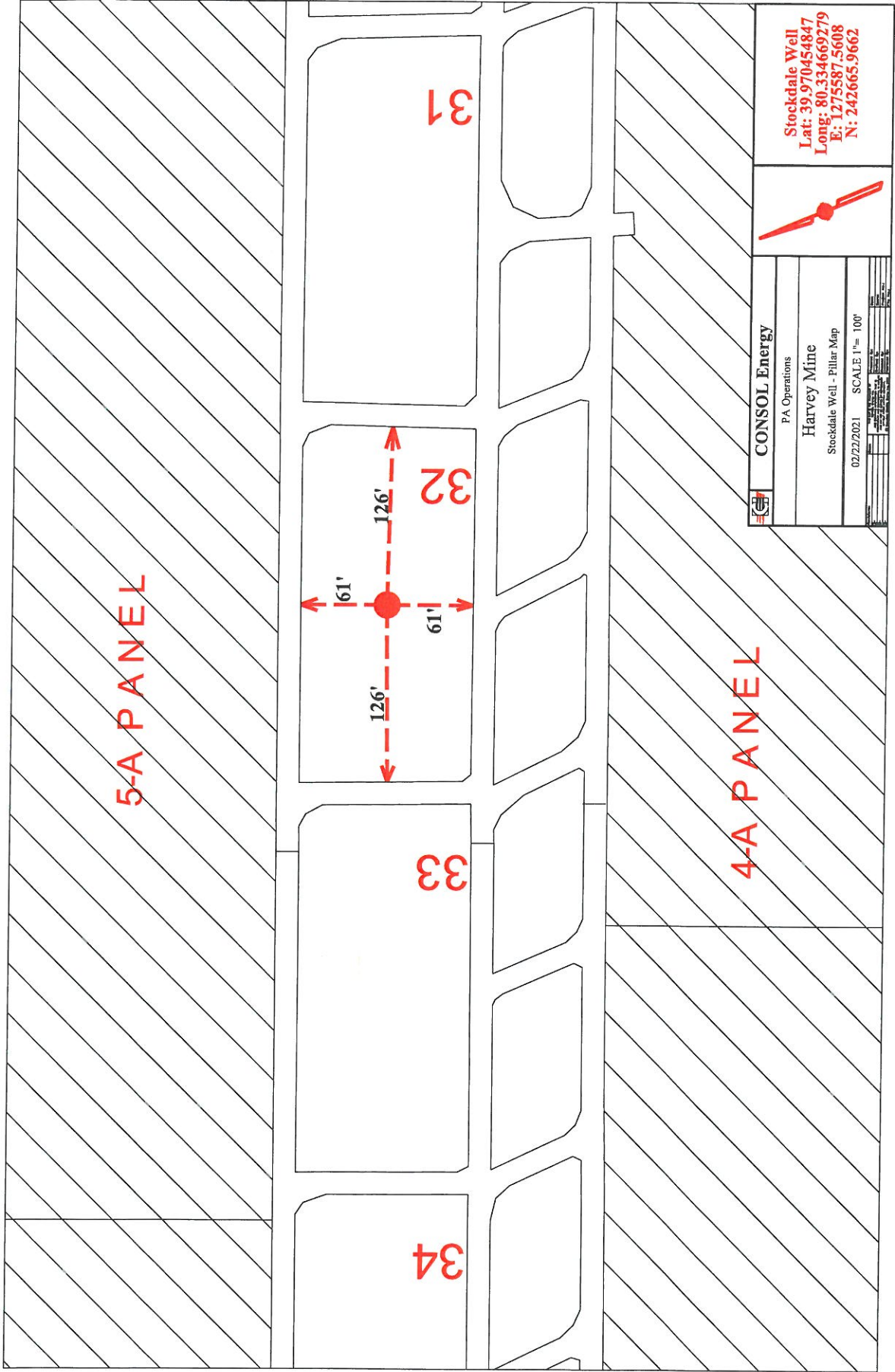
Stockdale Well - General Location Map

02/22/2021 SCALE 1"= 3,000'

Author	Checked	Scale	Sheet No.
Drawn	Reviewed	Project No.	Revision No.
Designed	Approved	Contract No.	Drawn By
Field Notes	Field Sketches	Field Photos	Field Maps
Field Data	Field Observations	Field Measurements	Field Calculations
Field Reports	Field Summaries	Field Conclusions	Field Recommendations
Field Plans	Field Diagrams	Field Tables	Field Figures
Field Maps	Field Charts	Field Graphs	Field Photographs
Field Videos	Field Audio	Field Documents	Field Data
Field Samples	Field Tests	Field Analyses	Field Results
Field Measurements	Field Calculations	Field Conclusions	Field Recommendations
Field Plans	Field Diagrams	Field Tables	Field Figures
Field Maps	Field Charts	Field Graphs	Field Photographs
Field Videos	Field Audio	Field Documents	Field Data
Field Samples	Field Tests	Field Analyses	Field Results



Stockdale Well
 Lat: 39.970454847
 Long: 80.334669279
 E: 1275587.5608
 N: 242665.9662



5-A PANEL

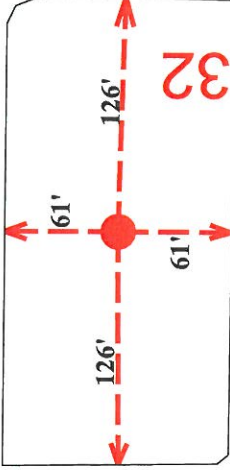
4-A PANEL

31

32

33

34



	CONSOL Energy PA Operations Harvey Mine Stockdale Well - Pillar Map 02/22/2021 SCALE 1" = 100' <small> 1. DATE OF REVISION 2. REVISION BY 3. REVISION DESCRIPTION 4. DRAWN BY 5. CHECKED BY 6. APPROVED BY 7. DATE OF APPROVAL 8. SCALE 9. SHEET NO. 10. TOTAL SHEETS </small>		Stockdale Well Lat: 39.970454847 Long: 80.334669279 E: 1275587.5608 N: 242665.9662
	<small> 11. PROJECT NO. 12. PROJECT NAME 13. PROJECT LOCATION 14. PROJECT STATUS 15. PROJECT START DATE 16. PROJECT END DATE 17. PROJECT BUDGET 18. PROJECT COST 19. PROJECT RISK 20. PROJECT IMPACT </small>		

Stockdale Pillar Stability Analysis

The purpose of this calculation is to evaluate the long-term stability of abutment pillars for the protection of the proposed Leatherwood Stockdale Well. The gas well will be located in a substantial pillar in the Harvey Mine in a mined-out area. Stability calculations were performed using 1.0.86.

The following images show the inputs that were used during the calculations:

The screenshot shows the 'Input Longwall Gate Parameters' dialog box with the 'Defaults' tab selected. The 'Loading parameters' section includes 'In situ coal strength (psi)' set to 900 and 'Overburden unit weight (pcf)' set to 162. The 'Pressure Arch factor' section has 'Set arch factor automatically' checked and 'Arch factor' set to 0.56. The bottom of the dialog features buttons for 'Previous Form', 'Copy Clip', 'Results', 'View Plan', 'Help', 'Cancel', and 'OK'.

Parameter	Value
In situ coal strength (psi)	900
Overburden unit weight (pcf)	162
Set arch factor automatically	<input checked="" type="checkbox"/>
Arch factor	0.56

The screenshot shows the 'Input Longwall Gate Parameters' dialog box with the 'Longwall Retreat' tab selected. The 'Panel Widths and Abutment Angles' section includes 'First panel width (ft)' set to 1530, 'Abutment angle for first panel' set to 21, 'Second panel width (ft)' set to 1450, and 'Abutment angle for second panel' set to 21. The 'CMRR' section has 'CMRR' set to 45, 'Suggested tailgate SF based on CMRR' set to 1.28, and 'CMRR manual setting' checked. A 'CMRR Estimator' button is also present. The bottom of the dialog features buttons for 'Previous Form', 'Copy Clip', 'Results', 'View Plan', 'Help', 'Cancel', and 'OK'.

Parameter	Value
First panel width (ft)	1530
Abutment angle for first panel	21
Second panel width (ft)	1450
Abutment angle for second panel	21
CMRR	45
Suggested tailgate SF based on CMRR	1.28
CMRR manual setting	<input checked="" type="checkbox"/>

The following outputs show a calculated factor of safety for isolated loading to be a 1.46.

ACPS Version: 1.0.86, 3/3/2021, 10:35:59

[ACPS Output]

[ACPS PILLAR STABILITY FACTORS]

Development Loading.....	7.37
Headgate Loading.....	3.37
Bleeder Loading.....	2.47
TAILGATE Loading.....	1.62
Isolated.....	1.46

Suggested TAILGATE SF based on the CMRR=45... 1.28

[WARNINGS]

The Pressure Arch loading model used in ACPS was derived from analysis of case history data from the Western and Central Appalachian coalfields in the US. The overburden rock in these two coalfields is relatively strong. No research has been conducted to test the applicability of the pressure arch loading model in other coalfields.

Leatherwood LLC

Stockdale #1-Conventional Gas Well Drill Plan

Ground Elevation		1250'		Location		N: 242,665.9662		E: 1,275,587.5608	
Hole Size	Casing	Top	Btm	Geology	Cement	Comments			
15"	13 3/8" casing	20'		Conductor	To Surface	-			
12-1/4"	9-5/8" casing	185'		Deepest Water Well	To Surface	-			
		400' TVD		Fresh Water Casing					
8-7/8"	7" casing	935'	940'	Sewickley		Run Gyro 30' above Pittsburgh Coal			
		1025'	1033'	Pittsburgh		Must have approval before drilling through pillar			
		1,533' TVD		Coal Protection Casing	To Surface				
		2178'	2428'	Big Injun					
		2748'	2778'	Thirty Foot Sand					
		2863'	2913'	Fifty Foot Sand					
		2943'	2973'	Nineveh Sand					
6-1/4"	4-1/2" casing	3,223' TVD		Production Casing	TOC to 1433'	-			