

September 2, 2022

Rusty Kelly  
Catamount Energy Partners, LLC  
1801 Broadway, Suite 1000  
Denver, CO 80202

**RE: Soil Gas Survey Results  
Bryce (OWP) #1-X (API#: 05-067-09087)  
La Plata County, Colorado**

Dear Mr. Kelly,

Cottonwood Consulting LLC (Cottonwood) is pleased to provide you with the results of a soil gas survey conducted in the vicinity of the Bryce (OWP) #1-X (API#: 05-067-09087) plugged & abandoned (P&A) well in La Plata County, Colorado (Figure 1). The methodology and associated results are summarized below.

### **Background**

The Bryce (OWP) #1-X was drilled in 1938 by Spatter Nick to a total depth of 4,835 feet below ground surface (bgs). The well was abandoned in 1949. The well is currently considered an “orphaned” well and managed by the Colorado Oil and Gas Conservation Commission (COGCC) Orphaned Well Program (OWP). See Attachment 1 for the COGCC scout card. The Bryce (OWP) #1-X abandoned well appears to be the primary conduit for methane migration that resulted in the explosion of the nearby Yoakum residence in 2005. Following the explosion, numerous soil gas surveys were conducted to evaluate the presence of methane seepage at the site. Results of the soil gas surveys indicated the presence of methane seepage from February 2005 through July 2007. Initial remediation of the Bryce (OWP) #1-X was conducted by the COGCC in November 2005 and methane seepage was not detected in the vicinity of the Bryce (OWP) #1-X between September 2007 and September 2010. An additional soil gas survey was conducted in June 2016 and also indicated that methane seepage was not detected in the vicinity of the Bryce (OWP) #1-X and surrounding area.

Catamount Energy Partners, LLC (Catamount) came to an agreement with the COGCC and was responsible for final plugging and abandonment of the Bryce (OWP) #1-X wellbore. Catamount plugged and abandoned the well in summer 2022 and contracted Cottonwood to conduct a pre-plugging and post-plugging soil gas survey around the Bryce (OWP) #1-X wellhead and surrounding area. The pre-plugging soil gas survey was conducted April 29, 2022 and indicated that methane was not seeping in the vicinity of the Bryce (OWP) #1-X. The post-plugging soil gas survey was conducted September 1, 2022.

### **Methodology**

Cottonwood was on-site to conduct the soil gas survey on September 1, 2022. Prior to the soil gas survey, Cottonwood conducted a utility locate to ensure that all underground utilities within the survey area were properly marked prior to ground disturbance.

Soil gas measurements were collected at 50-foot intervals in a grid surrounding the location of the Bryce (OWP) #1-X, the former Yoakum residence, and the water well associated with the Yoakum residence (Permit #: 233433).

At each measurement location, Cottonwood used a slide-hammer to advance a borehole to a total depth of approximately one to two feet bgs. Tubing connected to a GEM5000 Plus® Landfill Gas Meter was lowered into each borehole to collect measurements of methane, carbon dioxide, hydrogen sulfide, and oxygen. The concentration of each gas and the associated measurement location was recorded using a Trimble GeoXH® GPS unit capable of sub-meter accuracy. Additional observations regarding vegetation and general site conditions were recorded in a field notebook.

## Results

Methane was not detected in any of the measurement locations. Carbon dioxide, oxygen, and hydrogen sulfide concentrations were generally consistent with background levels. Vegetation in the survey area appeared to be consistent with seasonal and surrounding conditions.

Results of the soil gas survey are presented on Figure 1, soil gas measurements are presented in Table 1, and photographic documentation of site conditions during the survey is included as Attachment 2.

## Conclusions

Based on results of the soil gas survey, it does not appear that methane is seeping from the ground surface in the vicinity of the Bryce (OWP) #1-X, the former Yoakum residence, or the water well following plugging and abandonment of the well.

Should you have any questions, please do not hesitate to contact me at 970-764-7356 or [ksiesser@cottonwoodconsulting.com](mailto:ksiesser@cottonwoodconsulting.com). We appreciate the opportunity to provide services to Catamount.

Sincerely,



Kyle G. Siesser, P.G.

Cottonwood Consulting, LLC



Attachments: Figure 1 – Soil Gas Survey Area  
Table 1 – Soil Gas Survey Results  
Attachment 1 – Bryce (OWP) #1-X Scout Card  
Attachment 2 – Photographic Log

**FIGURE 1**




Notes: Soil gas survey conducted following plugging and abandoning the Bryce (OWP) #1-X. All measurements collected 9/1/2022.

### Legend

-  Oil & Gas Well
-  Water Well

### Subsurface Methane Gas Measurement

-  0.0%



Mapping by: E. Millar, 9/2/2022  
Coordinate System:  
NAD 1983 UTM Zone 13 N

Location: SWSW Sec 31 T33N R9W NMPM

**Figure 1**  
**Bryce (OWP) #1-X**  
**Soil Gas Survey Map**  
**Catamount Energy Partners, LLC**

**TABLE 1**

**Table 1**  
**Soil Gas Survey Results**  
**Bryce (OWP) #1-X**  
**Catamount Energy Partners, LLC**

<b>Point ID</b>	<b>CH4 (%)</b>	<b>CO2 (%)</b>	<b>O2 (%)</b>	<b>H2S (ppm)</b>	<b>Latitude</b>	<b>Longitude</b>
1	0.0	0.1	20.2	0	37.05411951	-107.8734709
2	0.0	0.2	20.1	0	37.05412731	-107.8733005
3	0.0	0.1	20.1	0	37.05414299	-107.8731289
4	0.0	0.2	19.8	0	37.05427274	-107.8731322
5	0.0	0.2	19.7	0	37.05427605	-107.8732919
6	0.0	0.1	19.5	0	37.0542622	-107.8734687
7	0.0	0.2	19.5	0	37.05440347	-107.8734647
8	0.0	0.4	19.3	0	37.05440368	-107.8733102
9	0.0	0.1	19.4	0	37.05439821	-107.8731271
10	0.0	0.1	19.5	0	37.05440151	-107.8736232
11	0.0	0.1	19.6	0	37.05439983	-107.8737764
12	0.0	0.1	19.6	0	37.05426061	-107.8738143
13	0.0	0.1	19.7	0	37.05426091	-107.8736442
14	0.0	0.1	19.9	0	37.05412865	-107.8736492
15	0.0	0.1	19.8	0	37.05412329	-107.8738127
16	0.0	0.1	19.9	0	37.05399127	-107.873809
17	0.0	0.1	20.1	0	37.05398703	-107.8736358
18	0.0	0	20.0	0	37.05399187	-107.8734595
19	0.0	0.1	20.0	0	37.05401407	-107.8732982
20	0.0	0.1	20.1	0	37.05401045	-107.8731235
21	0.0	0	20.2	0	37.0538619	-107.8731223
22	0.0	0.1	20.2	18	37.05386803	-107.8732745
23	0.0	0.1	20.2	0	37.05386334	-107.8734455
24	0.0	0.1	20.2	0	37.05385438	-107.8736118
25	0.0	0.1	20.2	0	37.05386044	-107.8737883
26	0.0	0	20.3	0	37.05372931	-107.8734427
27	0.0	0	20.3	0	37.05373371	-107.8732855
28	0.0	0	20.3	0	37.05372986	-107.8731116
29	0.0	0.1	20.4	0	37.05374228	-107.8729513
30	0.0	0.2	20.2	0	37.05359952	-107.8729451
31	0.0	0	20.5	0	37.0534739	-107.8729427
32	0.0	0	20.4	0	37.05346932	-107.8731074
33	0.0	0	20.5	0	37.05345386	-107.873278
34	0.0	0	20.5	0	37.05359526	-107.8732806
35	0.0	0	20.5	0	37.05359542	-107.8731065
36	0.0	0	20.5	0	37.05388169	-107.8729472
37	0.0	0	20.5	0	37.05388284	-107.8727652
38	0.0	0	20.5	0	37.05387965	-107.8726009
39	0.0	0.1	20.4	1	37.0537376	-107.872605
40	0.0	0	20.4	0	37.05412253	-107.8735137
41	0.0	0.1	20.4	0	37.05416676	-107.8734709

**Notes:**

All measurements collected on 9/1/2022.

CH4 - Methane

CO2- Carbon Dioxide

O2- Oxygen

H2S - Hydrogen Sulfide

% - percent

ppm - parts per million

## **ATTACHMENT 1**



# COGIS - WELL Information

Scout Card



[Related](#)



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[MIT](#)



[GIS](#)



[Doc](#)



[COA](#)



[Wellbore](#)



[Orders](#)

## Surface Location Data for API # 05-067-09087

Status: TA

11/16/2005

Well Name/No:

[BRYCE \(OWP\) #1-X](#)

(click well name for production)

Operator:

SPATTER\* NICK - 81448

Status Date:

11/16/2005

Federal or State Lease #:

FacilityID:

**281384**

LocationID:

**306944**

County:

LA PLATA #067

Location:

SWSW 31 33N9W N PM

Field:

IGNACIO BLANCO - #38300

Elevation:

6,020 ft.

Planned Location 390 FSL 765 FWL

Lat/Long: 37.054009/-107.873538

Lat/Long Calculated From Footages

## Wellbore Data for Sidetrack #00

Status: EP

11/15/2006

Spud Date:

5/13/1938

Spud Date is:

PLANNED

### Wellbore Permit

Permit #:

20054577

Expiration Date:

11/15/2006

Prop Depth/Form:

4835

Surface Mineral Owner Same:

not available

Mineral Owner:

not available

Surface Owner:

not available

Unit:

MESA VERDE

Unit Number:

Formation and Spacing: Code: MVRD , Formation: MESAVERDE , Order: , Unit Acreage: , Drill Unit:

### Wellbore Completed

Completion Date:

N/A

Measured TD:

Measured PB depth:

True Vertical TD:

True Vertical PB depth:

Casing:

String Type: CONDUCTOR , Hole Size: , Size: , Top: 0, Depth: 20, Weight: UNK

Cement:

Sacks: , Top: 0, Bottom: 20, Determination Method: VISU

Casing:

String Type: SURF , Hole Size: 10.625, Size: 8.625, Top: 0, Depth: 318, Weight: 24

Cement:

Sacks: 285, Top: 0, Bottom: 318, Determination Method: VISU

Casing:

String Type: 1ST LINER , Hole Size: 10.625, Size: , Top: 380, Depth: 1150, Weight: UNK

Cement:

Sacks: , Top: 380, Bottom: 1150, Determination Method: CALC

Casing:

String Type: 2ND LINER , Hole Size: , Size: 4.5, Top: 1121, Depth: 4835, Weight: UNK

Cement:

Sacks: 140, Top: 1121, Bottom: 4835, Determination Method: CALC

**Formation**

**Log Top**

**Log Bottom**

**Cored**

**DSTs**

No additional interval records were found for sidetrack 00.



## **ATTACHMENT 2**

Photographic Log  
Bryce (OWP) #1-X  
Soil Gas Survey  
Catamount Energy Partners, LLC

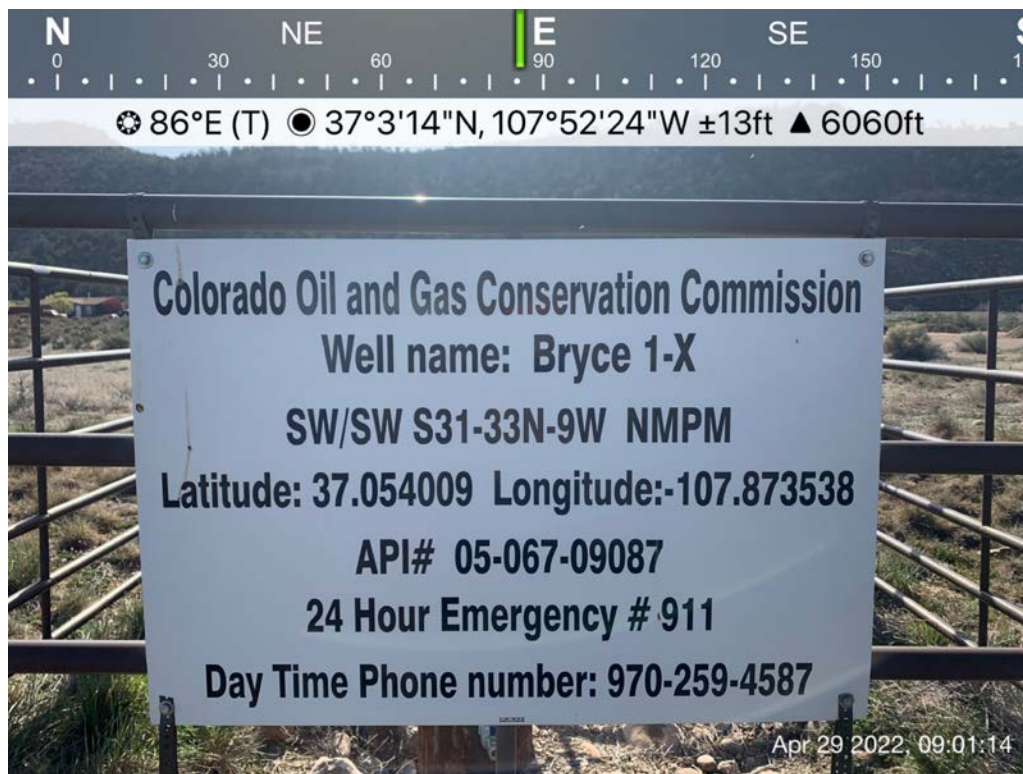


Photo 1: Bryce (OWP) #1-X well sign prior to plugging and abandonment, 4/29/2022.



Photo 2: Bryce (OWP) #1-X surrounding conditions, 9/1/2022.



**Photographic Log  
Bryce (OWP) #1-X  
Soil Gas Survey  
Catamount Energy Partners, LLC**



Photo 3: Looking north from the P&A, 9/1/2022.



Photo 4: Looking east from the P&A, 9/1/2022.



**Photographic Log**  
**Bryce (OWP) #1-X**  
**Soil Gas Survey**  
**Catamount Energy Partners, LLC**

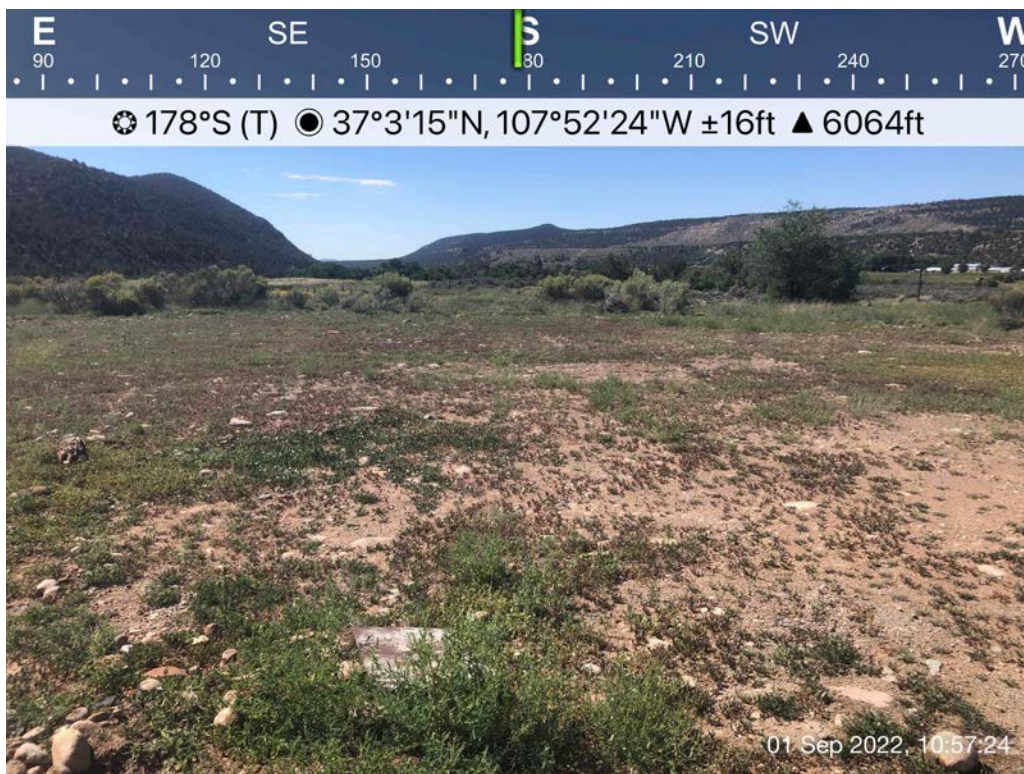


Photo 5: Looking south from the P&A, 9/1/2022.



Photo 6: Looking west from the P&A, 9/1/2022.