



November 15, 2022

CERTIFIED MAIL NO. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

Re: Stray Gas Investigation
DEP Identifier 357453
Warsaw Township, Jefferson County

[REDACTED]

The Department has completed its investigation of your property shown on Figure 1 (attached). Based on the information obtained to date, the Department has determined that your property was most likely impacted by active oil and gas operations. The well that was believed to be causing the stressed vegetation in your hay field has been plugged by the operator. The investigation is summarized below.

CASE INFORMATION

Date of Complaint	Nature of Complaint (odor, taste, quantity, use, color, gas)
June 16, 2021	Stress vegetation in hay field

INVESTIGATION SUMMARY

The Department visited the site on June 22, 2021 and observed several stressed vegetation areas within 76' of the S.J. Rockey #2 gas well. The WQS reported that no obvious spill or leak from the brine tank could be found at the time of the inspection. The Department contacted McIntire Oil and Gas (McIntire) and met with them onsite on June 24, 2021. Slam-bar holes (SB) were created in four of the bare spots. Gas was detected in all four areas with gas readings ranging from 3% to 84% methane. The annulus was opened during the inspection and allowed to vent. Your two water wells are located ~540' northwest of the gas well. The water wells were checked for gas in the headspace. No gas was detected in either water well.

The operator reported to the Department that the gathering line was pressure tested on June 24-25, 2021 and passed. Based on the results of the pressure test, the operator's gathering line was ruled out as a possible source of the stray gas. The gas well annulus was opened the following week and allowed to vent. A plastic line was installed that vented the annulus to the brine tank.

The Department monitored the stressed vegetation areas from June 28 - July 1, 2021. Gas readings were

consistent with the first readings, ranging from 3% to 86%. The annulus remained vented to the brine tank. The operator contacted the Department on July 2, 2021 and noted the gas well annulus was shut back in.

The operator noted that they thought Diversified had a gas line that ran through the area. Diversified was contacted on July 2, 2021 and met with the Department on site on July 8, 2021. Diversified could not find any lines using their pipeline locator tool in the vicinity of the stressed vegetation. The Diversified representatives onsite believed the lines were closer to Route 28 and ran parallel with the road. After further review of their records, Diversified found they did they have a 2" line, 2'-3' deep that runs east to west through the area. The line then turns north towards Route 28 just before the tree line to the east of the gas well. Diversified reported that the line usually has about 36 pounds of pressure. Diversified pressure tested the line shortly after the site visit on July 8, 2021 and reported that the line held pressure. On June 6, 2022 the line was walked and visually inspected for any additional stressed vegetation areas. Other than the ones that were established near the well, no additional stressed vegetation areas were found. A map of the location of the line, based on the information provided from Diversified, has been included as Figure 2.

During the July 2, 2021 site visit, free gas was detected at 100% in the stressed vegetation closest to the well and all of the other stressed vegetation areas had gas detected at higher concentrations than previously measured. Additional areas of stressed vegetation were also observed along the access road and to the south of the gas well. The well was not venting at this time. While onsite, a neighbor that takes hay off the field reported that they first noticed stressed vegetation 2 - 3 years ago. They noted that the stressed vegetation first showed up next to the well but has slowly spread over time.

The Department conducted a site visit on July 22, 2021. Numerous stressed vegetation areas were observed, and free gas readings were taken using SB. 100% methane was detected in most of the SB. The operator was contacted by the Department. It was requested that the well be vented for an additional amount of time. Before the well was vented, a gas sample was collected from the production string at 12:35pm (065-24564-Prod) and the annulus at 12:40pm (065-24564-Ann). A soil gas sample was taken from SB1 at 12:09pm (065-24564-SB1).

On July 23, 2021, 8 SB (SB1-SB8) monitoring points were established in stressed vegetation areas surrounding the S.J. Rockey #2 gas well. GPS locations and photographs of the SB locations were taken.

On October 14, 2021, during a site visit, the Department noticed the well was shut in and an additional stressed vegetation area was observed. An additional SB monitoring point (SB9) was established. The well remained shut in on the October 20, 2021 site visit. The operator was contacted on October 21, 2021 as to why the well was shut in. The operator noted the well was shut in on that Monday so a gas sample could be taken on Tuesday and that the well tender was supposed to have the well venting again by the end of the week. During the October 27, 2021 site visit, the well was found to be venting to the brine tank.

On January 14, 2022 the Department met with Diversified to collect a sample from their line that runs through the site. The sample (Diversified Line) was taken at 10:00am from an access point located near the Route 28 mile marker 320, approximately 665' southwest of the site. An additional soil gas sample was taken from SB7 (SB7) at 10:25am.

During a field visit on June 9, 2022 the well was found to be shut in with only the surface casing venting to the tank. 4% LEL was detected from the tank. No gas had been detected from the tank since September 10, 2021 (44% LEL). The well was found to be shut in with only the surface casing venting to the surface on all of the

site visits from June 9, 2022 to July 21, 2022. On the July 21, 2022 site visit, you informed the Department that you spoke with the well tender and the well tender told you the well had been sold to Penn View Exploration (Penn View). Follow-up correspondence with McIntire confirmed the sale of the well to Penn View.

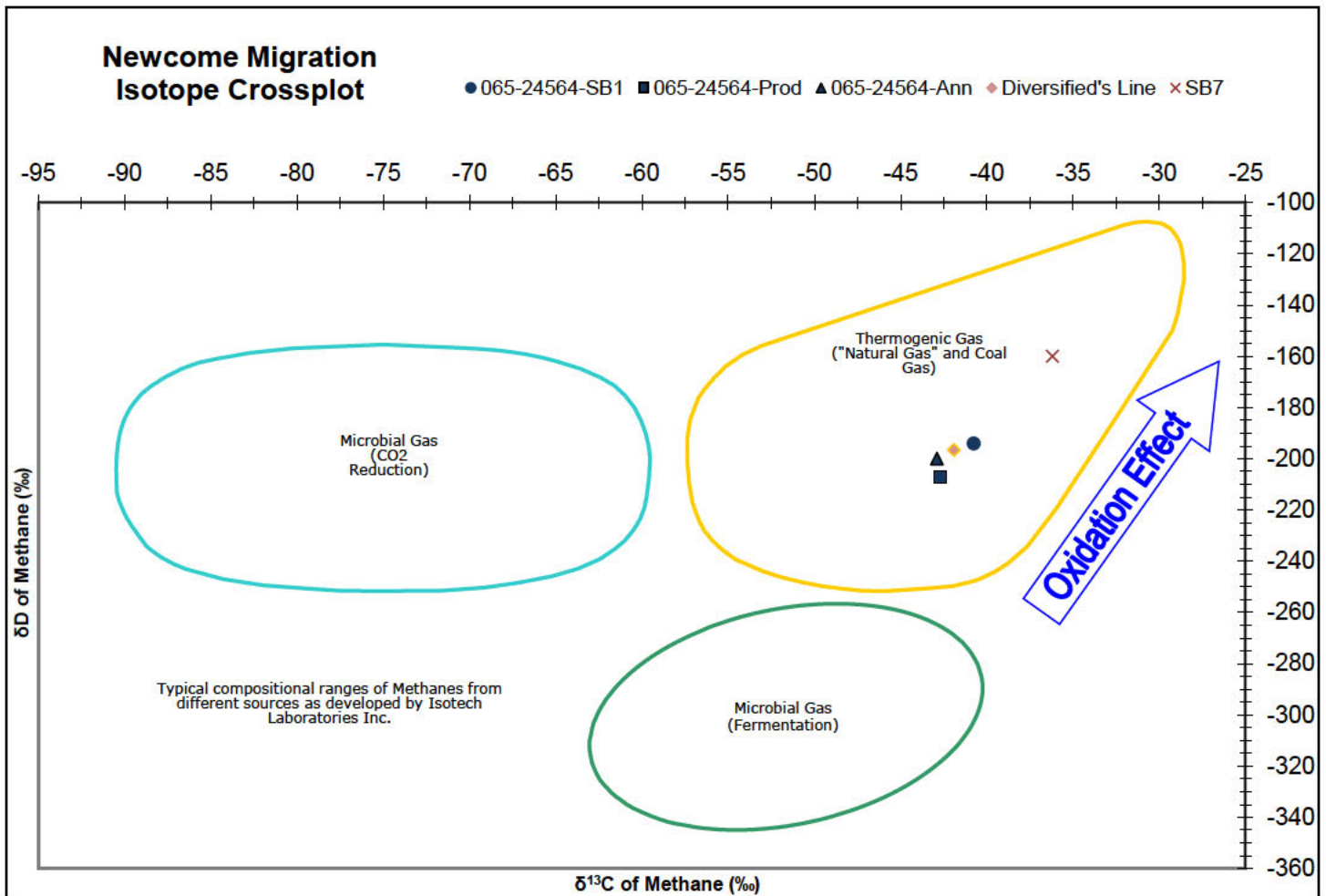
On August 16, 2022, the Department met with representatives from McIntire, Penn View and Moody and Associates (Moody) to take a sample from the 7" casing and dig in some of the stressed vegetation areas to see if there was any evidence of pipelines or drain tiles. Small trenches approximately 2' deep were dug and backfilled in SB1, SB6, SB8 and SB9. Less than 1% LEL was detected in any of the trenches using Moody's Bascom Turner or the Department's Altair 5 gas meters. No evidence of drain tiles or pipelines were observed in any of the trenches as well. Gas samples were taken from the 7" casing by Moody and the Department, but after the excavation, it was decided to not send in the samples at this time.

A visual comparison of the SB monitoring points from when they were created (July 23, 2021/October 14, 2021) until after the field was mowed on June 26, 2022 has been included as Figure 3. During this time, the well was venting a majority of the time.

Figure 1 shows the location of the SB monitoring locations. All GPS points were taken with Garmin Montana. Unless otherwise stated, all gas readings were taken using an Altair 5. Unless otherwise stated, all gas samples were sent to Isotech for NG2 analysis.

Isotopic Results:

Isotopic results from the 065-24564-SB1 gas sample had methane $\delta^{13}\text{C}$ value of -40.76 permil, methane δD value of -194.0 permil and ethane $\delta^{13}\text{C}$ values of -33.5 permil. Isotopic results from the 065-24564-Prod gas sample had methane $\delta^{13}\text{C}$ value of -42.73 permil, methane δD value of -207.0 permil and ethane $\delta^{13}\text{C}$ value of -33.35 permil. Isotopic results from the 065-24564-Ann gas sample had methane $\delta^{13}\text{C}$ value of -42.90 permil, methane δD value of -199.9 permil and ethane $\delta^{13}\text{C}$ values of -34.45 permil. Additional gas samples were taken from Diversified's Line and SB7 on January 14, 2022. Isotopic results from the SB7 gas sample had methane $\delta^{13}\text{C}$ value of -36.2 permil, methane δD value of -160 permil. Isotopic results from the Diversified Line gas sample had methane $\delta^{13}\text{C}$ value of -41.9 permil, methane δD value of -196.6 permil and ethane $\delta^{13}\text{C}$ values of -35.34 permil. All of the sample results are illustrated on a cross-plot of methane $\delta^{13}\text{C}$ and δD and a compositional plot below. All samples plotted as methane from a thermogenic origin.



There are 2 active gas wells, including the S.J. Rockey #2 gas well, and 2 plugged gas wells located within 1,000' of the stressed vegetation areas. All 4 wells were inspected by an OGI. Neither of the 2 plugged wells had monuments, so the locations where they are plotted in the Collector App were checked for soil gas using SB. No gas was detected at either plugged well location. No violations were noted for the other active gas well. The S.J. Rockey #2 well had some violations. Based on Bituminous Historical Mylars, strip mining of the Clarion and Lower Kittanning coal seams took place to the west of the site. A map showing the location of the gas wells and mining has been included as Figure 4.

Based on observations during the site visits, review of relevant documents and sampling results, the Department determines that the methane found in the hay field was due to oil and gas activity and is most likely coming from the nearby S.J. Rockey #2 gas well. Following the completion of the excavations on August 16, 2022, the operator decided to move forward with plugging the well and the well was plugged September 16, 2022. During the plugging process, holes were observed in the 4" casing and the surface casing was found to be compromised. As of the date of this letter, the soil gas concentrations observed have been very low, similar to those levels seen when the well was venting.

Please contact Alicia Furey at 814-332-6132 if you have any questions about the Department's determination regarding the Stray Gas Investigation.

Sincerely,



Richard L. Neville
NWRO District Oil and Gas Manager
District Oil and Gas Operations

Enclosures: Figure 1
Figure 2
Figure 3
Figure 4

cc: A. Furey (email)
J. Lichtinger (email)

References

PA Oil and Gas Mapping Tool, Pennsylvania Departmental Protection,
<https://gis.dep.pa.gov/PaOilAndGasMapping/OilGasWellsStrayGasMap.html>

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Figures 1-4

