Daily Completion and Workover

Report # 1.0, Report Date: 8/26/2024

Well Name: PCI Canterra Tweed M-47

UWI	Surface Legal Location	Field Name	License #	State/Province	Well Configuration Type
300M476700125450		Tweedie	01476	N.W.T	Vertical

Driling KB Elevation (m)	Ground Elevation (m)	KB-Ground Distance (m)	KB-CF (m)	KB-TH (m)	PBTD (All)	Total Depth (All)
435.22	429.10	6.12	6.12		Original Hole - 1,322.00	Original Hole - 1,418.00

Primary Job Type	Completions Project	Job Start Date	Job End Date
Diagnostic		8/26/2024	8/26/2024

Objective
The objective is to do gas migration testing and a EM Survey of the lease.

Well Site Supervisor	Superintendent	Engineer
Van Steinburg, Derek	Koteles, Jonathan	Heffel, Greg

Primary Contractor	Regulatory Reportable Event
GChem Ltd	Yes

AFE Number	Total AFE + Supp Amount (Cost)	Daily Field Est Total (Cost)	Cum Field Est To Date (Cost)
11600174	43,784.99	49,333.47	49,333.47

Morning Readings

Weather	Temperature (°C)	Road Condition
Rain	11	N/A - Fly In

24 Hr Operations Summary
HSE Concerns: None
NPT Concerns: None
Service Concerns: None
Permit(s): N/A
OROGO Reportable: SCVF Test - 0 Bubbles / 15 min, Gas Migration Test - 2 - 12 ppm Methane (all 18 probes)
Operations: Travelled to location via helicopter, completed gas migration testing w/ GCHEM as per OROGO requirements and completed EM lease survey (EM 31 & EM 38) w/ Frontier Geoscience.
Forecast: Job completed.

Daily Pressures

Type	P (kPa)
Casing	10

Daily Fluids Summary

Fluid	To well (m³)	From well (m³)	Cum to Well (m³)	Cum from Well (m³)	Non-recov (m³)	Cum Non-recov (m³)

Job Time Log

Start Time	End Time	Dur (hr)	Code 2	Com
08:30	09:00	0.50	Safety - Daily, Prejob, FLHA, WARI & F/T's	- Crews travelled to helicoptor hanger - Held a Completions daily operations FLHA safety meeting - Preformed head count of personnel on location - Decca (1) GCHEM (1) FGS (1) GSHC (1) BMF (1) = 5 total - Reviewed, discussed the well Program, FEMP and ERP - Filled out and reviewed all FLHA's pertaing to "Helicopter Operations", "Gas Migration Testing" and "EM Surveying". - Bump tested 4x personal and 5x continuous LEL monitors
09:00	10:15	1.25	Move Rig and Auxiliary Equipment - Site to Site	- Traveled to location via helicopter from Norman Wells - Completed 3x lease passes and searched / cleared for any near by wildlife - Off loaded all equipmenbt from the helicoptor basket
10:15	10:45	0.50	Well Checks - Other (Details)	- WSS swept location and well bore w/ 5x LEL monitor as follows: O^2 % = 20.8, LEL % = 0.0 (around the wellhead) H^2S ppm = 0.0, CO ppm = 20.0 - Checked SIP's as follows: - Production Casing = 10.0 kPa w/ O ppm H2S and 20 ppm CO present - Completed initial hazard and location checks
10:45	11:00	0.25	SCVF (Surface Casing Vent Flow) test	- Completed SCVF test w/ 0 bubbles / 15 min, good test - Completed gas sample on SCV = 1 - 2 PPM Methane - Pulled and collected 2x samples from the SCV
11:00	12:30	1.50	SGM (Soil Gas Migration) test	- GCHEM set up gas migartion equipment ---> NOTE: the wellhead had a wood platform covering the culvert around the wellhead ground opening w/ cenet surounding the wellhead are in a 1.0 m radius - Drilled and installed 18 x sample probes as follows: - North from wellhead center: 0.5 m 1.0 m, 3.0, 5.0 m, back ground 15.0 m (1.0 m deep) - East from wellhead center: 0.5 m, 1.0 m, 3.0, 5.0 m, back ground 15.0 m (1.0 m deep) - West from wellhead center: 0.5 m, 1.0 m, 3.0, 5.0 m, back ground 15.0 m (1.0 m deep) - South from wellhead center: 1.0 m, 3.0, 5.0 m, (1.0 m deep) - Pulled and collected samples from all probes (18 x total) ---> NOTE: max Methane readings from all probes = 1 - 12 PPM (well under the 500 PPM thresh hold) - Pulled all the sample probes and rigged out GCHEM

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435.22	429.10	6.12	6.12		Original Hole - 1,322.00	Original Hole - 1,418.00

Job Time Log

Start Time	End Time	Dur (hr)	Code 2	Com
12:30	15:15	2.75	Well Checks - Other (Details)	- Frontier Geo Science rigged in EM testing equipment - Gridded out the location w/ survey flags from well center out as follows: - North: 80.0 m x 10.0 m grid pattern - West: 80.0 m x 10.0 m grid pattern - East: 80.0 m x 10.0 m grid pattern - South: 80.0 m x 10.0 m grid pattern - Completed EM 38 survey at 10 m grid pattern w/ 12 readings / 1 meter - Completed EM 31 survey at 20.0 m grid pattern w/ 1 reading / 5 meters - Pulled and removed all survey flags, rigged out and loaded all equipment
15:15	15:30	0.25	Move Rig and Auxiliary Equipment - Site to Site	- Closed, capped and secured the wellhead - Cleaned up debris and garbage from around wellhead and location - WSS completed final wellhead and location walk down - Demobilized all equipment / personnel from location back to Norman Wells via helicoptor - Job completed

Gas Volumes

Date	Type	Zone	Volume (E3m³)	Duration (hr)

NPT Interval Problems

Problem Type	Problem Subtype	Dur (Gross) (hr)	Total Problem Hours (hr)

ENERGY-FORENSICS

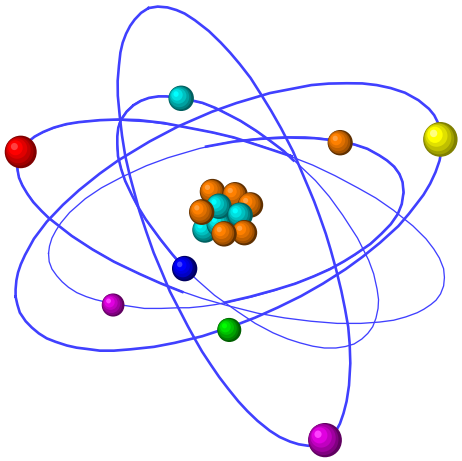
Suncor Energy Inc.

W/O 24086

Vapour Intrusion Testing

SUNCOR ET AL TWEED LAKE M-47

August 26, 2024



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FORENSIC SOLUTIONS FOR ENERGY CHALLENGES

1.0 Vapor Intrusion Assessment Summary (VIA)

Operating Company: Suncor Energy Inc.
Well Name: SUNCOR ET AL TWEED LAKE M-47
UWI: M-47

License Number: Nor Provided
Test Date August 26, 2024
GCHEM Project Number 24086

2.0 Surface Casing Vent Flow (SCVF) Test Summary

SCV Ten-Minute Bubble Test Result	Passed
SCV Flow Rate (m^3/day)	NA
SCV Pressure-Temp Logger Installed	NA
SCV Pressure-Temp Data Logger Removed	NA
SCV Shut-In Time (hrs)	NA
SCV MAX-Recorded Build Up Pressure (kPa)	NA
SCV Stabilized Build-up Pressure (kPa):	NA
SCV Stabilized Build-up Time (hours)	NA
SCV Standpipe Max CH_4 Content:	1 ppm v/v
SCV Standpipe Max H_2S Content	<1 ppm v/v

SCV Gas Spls. Collection-Measurement	**Total Collected**	**Analysis Requested***	**Classification****
SCV Samples (Total)	2		
SCV Combustible Gas Class. Level-1 (Chemical)		1	NON-IMPACTED
SCV Combustible Gas Class. Level-2 ($\delta^{13}C$)		NA	NA
SCV Combustible Gas Class. Level-3 (δD)		NA	NA
SCV Combustible Gas Class. Level-4 (^{14}C)		NA	NA

3.0 Soil Gas Migration (AGM-VIA) Soils Outside Casing Summary

A) Non-Intrusive CH_4 Surface Soil Scan (PMD)

Well Casing Surface CH_4 Test Sites	28
MAX Surface CH_4 Reading	1 ppm v/v
MAX H_2S Well Soil Reading (ppm v/v)	<1
Number of Background Sites	1
MAX Background CH_4 (ppm v/v)	1 ppm v/v
Max H_2S BKG Soil Reading (ppm v/v)	<1
Surface CH_4-PMD Gas Classification	NON-IMPACTED

B) Intrusive Auger Test Holes with Soil Vapor Probes

Number Soil Vapor Probe (SVP) Test Sites	17		
MAX SVP CH_4 Reading	1 ppm v/v		
Max H_2S SVP Field Reading (ppm v/v)	<1 ppm v/v		
Number SVP BKG Test Sites	3		
MAX SVP CH_4 BKG Test Sites (ppm v/v)	1 ppm v/v		
SVPs Gas Spl. Collection & Measurement	**Total Collected**	**Analysis Requested***	**Test-Site**
Soil Vapor Probes (SVPs) AGM (Total)	7		
SVPs & Sites Requested for Level-1 Analysis		6	Flux N0.5, N1, N3, E3, S1 & S5
Combustible Gas Classification Level-1 (Chem.)		NON-IMPACTED	
SVPs & Sites Requested for Level-2 Analysis		NA	NA
Combustible Gas Classification Level-2 ($\delta^{13}C$)		NA	
SVP & Sites Requested for Level-3 Analysis		NA	NA
Combustible Gas Classification Level-3 (δD)		NA	
SVP & Sites Requested for Level-4 Analysis		NA	NA
Combustible Gas Classification Level-4 (^{14}C)		NA	
BKG Gas Spl. Collection-Measurement	**Total Collected**	**Analysis Requested***	**Test Site**
BKG Soil Vapor Probe (SVPs) (Total)	3		
SVPs & Sites Requested for Level-1 Analysis		3	NE25, S25 & W25
Combustible Gas Classification Level-1 (Chem.)		BASELINE	
SVPs & Sites Requested for Level-2 Analysis		NA	NA
Combustible Gas Classification Level-2 ($\delta^{13}C$)		NA	
SVP & Sites Requested for Level-3 Analysis		NA	NA
Combustible Gas Classification Level-3 (δD)		NA	
SVP & Sites Requested for Level-4 Analysis		NA	NA
Combustible Gas Classification Level-4 (^{14}C)		NA	

4.0 Interpreted Source of Natural Gas Found at/near Surface

Sample Point	Geologic Formation	Depth Range	Source Depth
This well does not contain evidence of surface casing vent flow or active gas migration in the soils outside of casing. No source interval determination is necessary.			

5.0 Vapour Intrusion Testing and Sampling Comments

Assessment-Collection Date: August 26, 2024

1) The Surface Casing Vent (SCV) passed the ten-minute bubble test (no observable flow) and a combustible gas level of 1 ppm v/v methane was measured
2) A surface combustible gas scan was performed near the wellbore using a Sensit Portable Methane Detector (PMD). All readings were low (up to 1 ppm v/v methane) and comparable to three backgrounds (1 ppm v/v) established away from the wellbore.
3) An intrusive soil gas migration test was then performed by drilling test holes and inserting Soil Vapor Probes (SVPs). Combustible gas readings in one SVP was slightly elevated (12 ppm v/v – S5), comparable to the background probes (1 ppm v/v methane) installed away from the wellbore to establish background levels in the area and for comparison to other samples collected during this investigation.
4) Six soil gas samples from SVPs (Flux N0.5, N1, N3, E3, S1 & S5) and gases from background (BKG1 NE25, BKG2 W25 & BKG3 S25) were collected, contained, and preserved for geochemical analysis and characterization, classification, geologic origin (source) and depth measured from the KB.
5) Methane and C2 + light alkane gas levels in gas samples collected from the soils near the wellbore are comparable to expected baseline / background established 25m northeast of the wellbore.
6) C_{6+} contents in the soil gas samples are low and comparable to background levels.

Recommendations and Conclusions

1) This well does not contain evidence of surface casing vent flow or active gas migration in the soils near the wellbore and is classified as NON-IMPACTED.

Figure 1. AGM Non-Intrusive Surface PMD

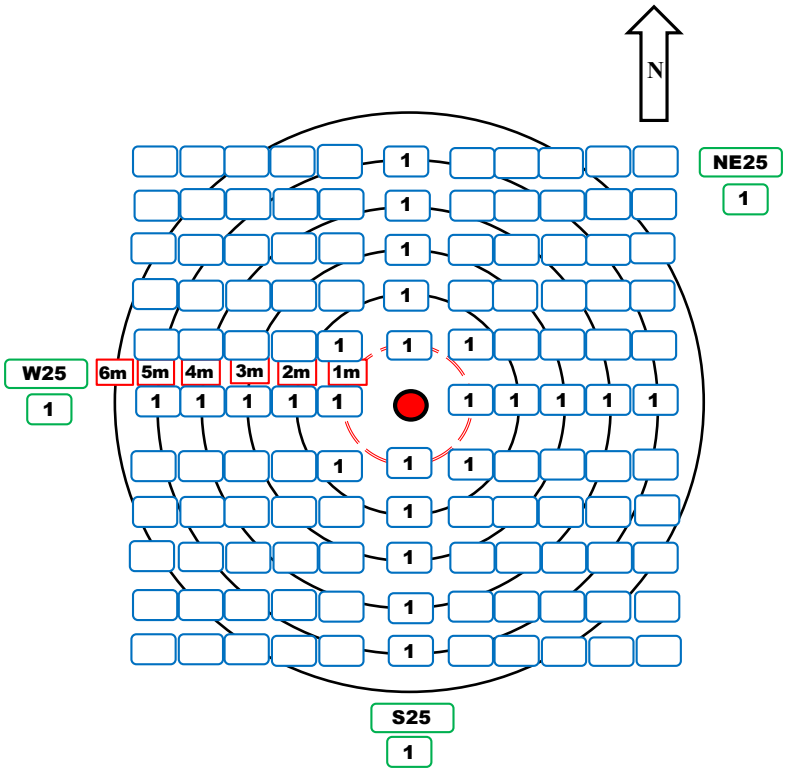

Figure 1A. Non-Intrusive CH_4 Surface a Well Casing Detail VIEW

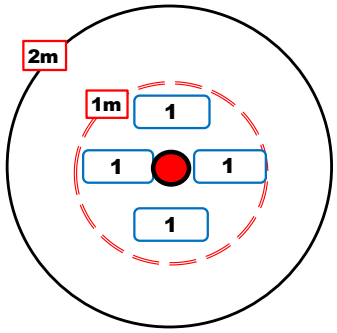

Table 1. AGM Non-Intrusive Surface PMD

WELL CASING (AGM) Non-Intrusive Surface PMD (CH_4) Soil Scan

Test Site (m)	PMD CH_4 (ppm v/v)	[%LEL](% Vol)	Test Site (m)	PMD CH_4 (ppm v/v)	[%LEL](% Vol)	Test Site (m)	PMD CH_4 (ppm v/v)	[%LEL](% Vol)	Test Site (m)	PMD CH_4 (ppm v/v)	[%LEL](% Vol)
N.5	1		E.5	1		S.5	1		W.5	1	
N1	1		E1	1		S1	1		W1	1	
N2	1		E2	1		S2	1		W2	1	
N3	1		E3	1		S3	1		W3	1	
N4	1		E4	1		S4	1		W4	1	
N5	1		E5	1		S5	1		W5	1	
N5-E1			E5-S1			S5-W1			W5-N1		
N4-E1			E5-S2			S4-W1			W5-N2		
N3-E1			E5-S3			S3-W1			W5-N3		
N2-E1			E5-S4			S2-W1			W5-N4		
N1-E1	1		E5-S5			S1-W1	1		W5-N5		
N1-E2			E4-S5			S1-W2			W4-N5		
N2-E2			E4-S4			S2-W2			W4-N4		
N3-E2			E4-S3			S3-W2			W4-N3		
N4-E2			E4-S2			S4-W2			W4-N2		
N5-E2			E4-S1			S5-W2			W4-N1		
N5-E3			E3-S1			S5-W3			W3-N1		
N4-E3			E3-S2			S4-W3			W3-N2		
N3-E3			E3-S3			S3-W3			W3-N3		
N2-E3			E3-S4			S2-W3			W3-N4		
N1-E3			E3-S5			S1-W3			W3-N5		
N1-E4			E2-S5			S1-W4			W2-N5		
N2-E4			E2-S4			S2-W4			W2-N4		
N3-E4			E2-S3			S3-W4			W2-N3		
N4-E4			E2-S2			S4-W4			W2-N2		
N5-E4			E2-S1			S5-W4			W2-N1		
N5-E5			E1-S1	1		S5-W5			W1-N1	1	
N4-E5			E1-S2			S4-W5			W1-N2		
N3-E5			E1-S3			S3-W5			W1-N3		
N2-E5			E1-S4			S2-W5			W1-N4		
N1-E5			E1-S5			S1-W5			W1-N5		

BACKGROUND Non-Intrusive Surface PMD (CH_4) Soil Scan

Test Site (m)	PMD CH_4 (ppm v/v)	(%)	Test Site (m)	PMD CH_4 (ppm v/v)	(%)	Test Site (m)	PMD CH_4 (ppm v/v)	(%)	Test Site (m)	PMD CH_4 (ppm v/v)	(%)
NE25	1										
S25	1										
W25	1										

Figure 2. AGM Intrusive SVPs

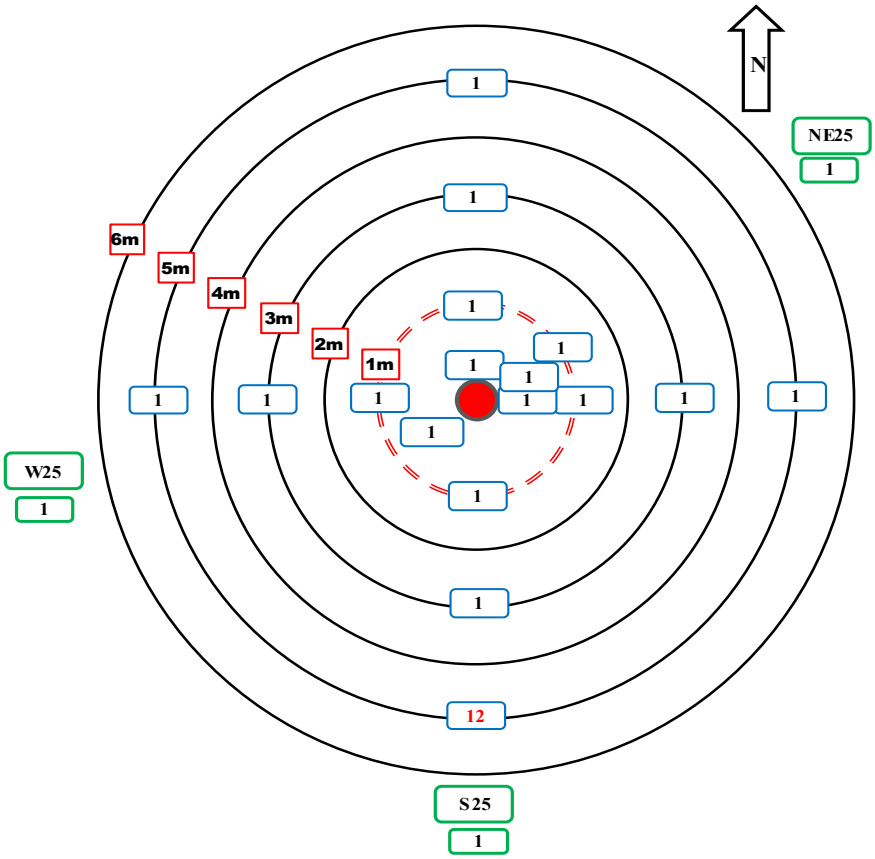

Table 2. AGM Intrusive SVPs

Intrusive AGM - Hand Auger-Test Hole-Install Soil Vapor Probes (SVPs) ATM-Isolated

Test Site (m)	Soil Vapor Probes IR-CH_4 (ppm v/v)	IR-CH_4 [%LEL](% Vol)	H_2S (ppm v/v)	Soil Parameters Type	Moist. (1-5)	HC-CONT (Y-N)	Gas Sample (Y-N)	Site Assessment Comments
Flux N0.5	1		n/a	n/a			No	
N1	1		<1.0	silt	3	No	Yes	
N3	1		<1.0	silt	3	No	Yes	
N5	1		<1.0	silt	3	No	No	
NE0.5	1		<1.0	silt	3	No	No	
NE1	1		<1.0	silt	3	No	No	
E0.5	1		<1.0	silt	3	No	No	
E1	1		<1.0	silt	3	No	No	
E3	1		<1.0	silt	3	No	Yes	
E5	1		<1.0	silt	3	No	No	
S1	1		<1.0	silt	3	No	Yes	
S3	1		<1.0	silt	3	No	No	
S5	12		<1.0	silt	3	No	Yes	
SW0.5	1		<1.0	silt	3	No	No	
W1	1		<1.0	silt	3	No	No	
W3	1		<1.0	silt	3	No	No	
W5	1		<1.0	silt	3	No	No	

Test Site (m)	Soil Vapor Probes IR-CH_4 (ppm v/v)	IR-CH_4 (% Vol)	H_2S (ppm v/v)	Soil Parameters Type	Moist. (1-5)	HC-CONT (Y-N)	Gas Sample (Y-N)	Site Assessment Comments
NE25	1		<1.0	silt	3	No	Yes	
S25	1		<1.0	silt	3	No	Yes	
W25	1		<1.0	silt	3	No	Yes	

Table-3. High resolution molecular and stable carbon isotopic compositions:

Sample Point / Date Collected / Gas Component	SCV Aug. 26-24 ppm v/v	Flux N0.5 Aug. 26-24 ppm v/v	N1 Aug. 26-24 ppm v/v	N3 Aug. 26-24 ppm v/v	E3 Aug. 26-24 ppm v/v	S1 Aug. 26-24 ppm v/v	S5 Aug. 26-24 ppm v/v
Neon	22.88	21.53	23.90	22.07	22.25	22.46	22.93
Hydrogen	48.80	38.80	539.8	687.2	79.29	414.6	45.31
Helium	3.91	3.77	4.26	3.72	3.81	3.95	4.38
Nitrogen	779612	778814	778315	777617	778151	780922	778537
Oxygen	219743	220630	219918	220167	220447	216769	218676
Carbon Dioxide	566.7	490.2	1197	1501	1295	1866	2713
Methane	1.85	2.05	2.24	1.70	1.75	1.92	1.30
Ethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Propane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Propene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
iso-Butane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
n-Butane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
iso-Pentane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
n-Pentane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
C6+	0.30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
C1 Index (C1/ΣC2+)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C2 Index (C2/ΣC3+)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C3 Index (C3/ΣC4+)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C4 Index (C4/C5)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ΣC2+	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ATM Ratio (N2/O2)	3.55	3.53	3.54	3.53	3.53	3.60	3.56
Vol % CO2 of TG	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Vol % Lt. Alk. of TG	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vol % Lt. Alk. CH4	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Vol % Lt. Alk. C2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vol % C2+ of TG	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stable Carbon Isotope Compositions (‰ VPDB)							
d13C CH4	nm	nm	nm	nm	nm	nm	nm
d13C C2H6	nm	nm	nm	nm	nm	nm	nm
d13C C2H4	nm	nm	nm	nm	nm	nm	nm
d13C C3H8	nm	nm	nm	nm	nm	nm	nm
d13C C3H6	nm	nm	nm	nm	nm	nm	nm
d13C i-C4H10	nm	nm	nm	nm	nm	nm	nm
d13C n-C4H10	nm	nm	nm	nm	nm	nm	nm
d13C i-C5H12	nm	nm	nm	nm	nm	nm	nm
d13C n-C5H12	nm	nm	nm	nm	nm	nm	nm
d13C CO2	nm	nm	nm	nm	nm	nm	nm
Stable Hydrogen Isotopic Compositions (‰ VSMOW)							
dD H2	nm	nm	nm	nm	nm	nm	nm
dD CH4	nm	nm	nm	nm	nm	nm	nm
dD C2H6	nm	nm	nm	nm	nm	nm	nm
dD C3H8	nm	nm	nm	nm	nm	nm	nm
dD i-C4H10	nm	nm	nm	nm	nm	nm	nm
dD n-C4H10	nm	nm	nm	nm	nm	nm	nm
14C Concentration (pMC)	nm	nm	nm	nm	nm	nm	nm

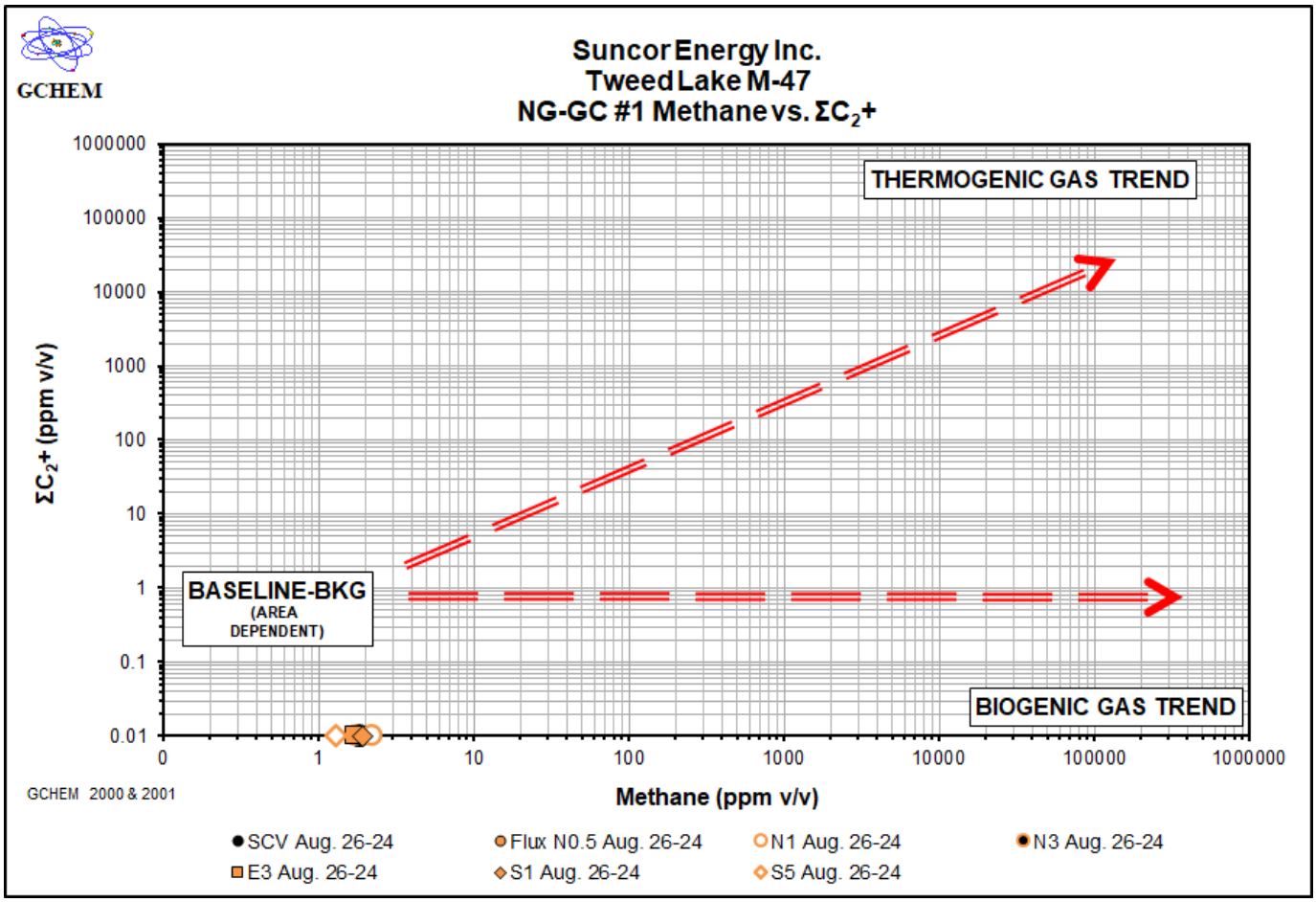

Figure 3. NG-GC#1 ΣC2+ vs Methane. Combustible gases detected in soils and SCVs at a wellhead may result from several origins. Natural gases indicative of SCVF or AGM are thermogenic in origin (natural gas in deep reservoirs), contain high methane and C_2+ contents and plot in the Upper RH Quadrant. Low natural gas levels in background, off lease areas are naturally present in soils, vary from region to region and plot in the Lower LH Quadrant. Biogenic gases (swamp-gas) are produced by bacteria, are comprised of predominantly methane and plot in Lower RH Quadrant. Samples plotting in the Lower LH and RH do not contain SCVF or AGM and would not require down-hole remediation.

NG-GC-1 Comments

1) C2+ light alkane gas levels in the soil gas samples are comparable to the background / baseline levels indicating that this well is not impacted with migrating thermogenic natural gases.

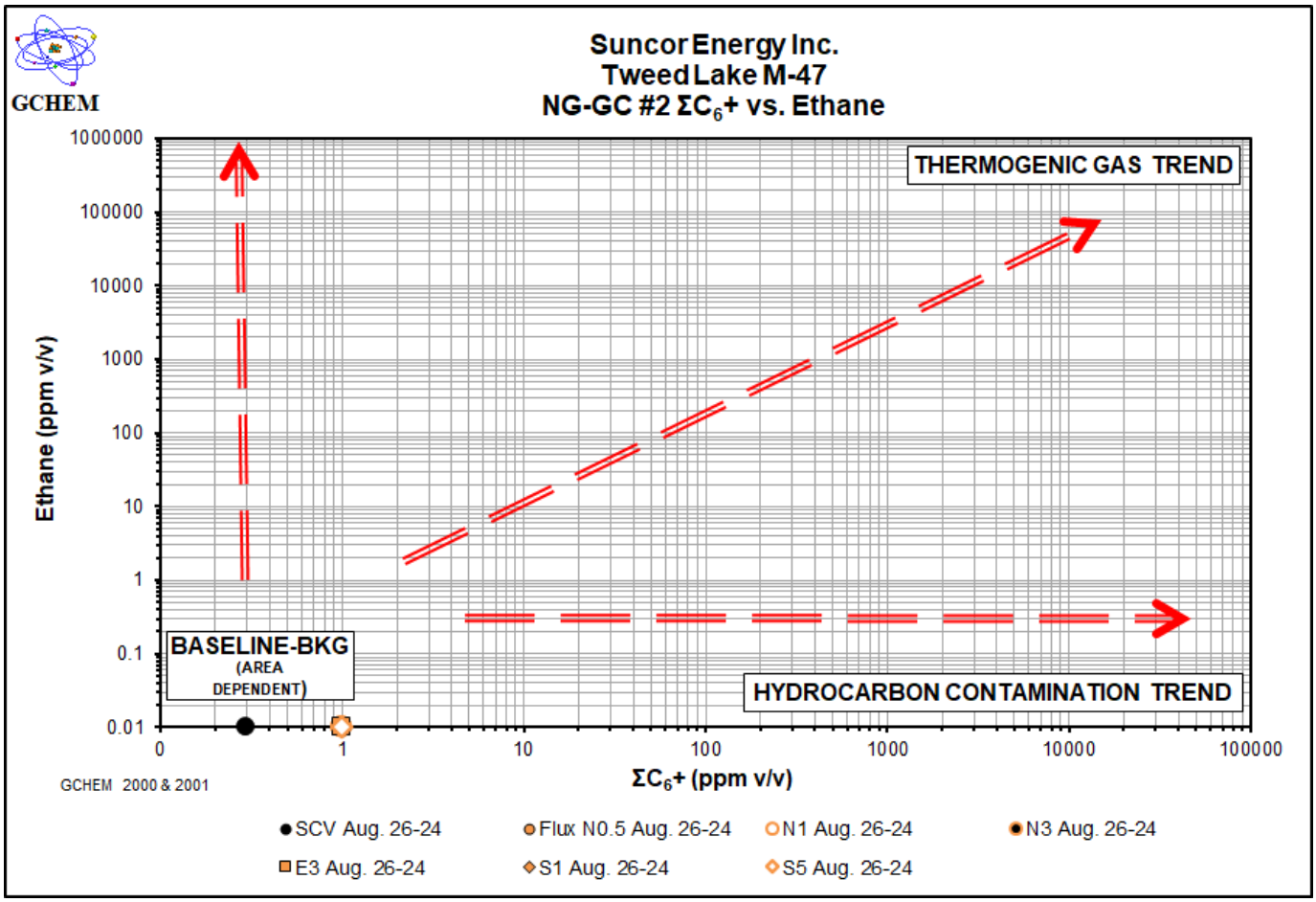

Figure 4. NG-GC #2 ΣC$_6$+ vs Ethane. C$_6$+ gases are relatively large molecules that do not readily or easily migrate in large quantities from depth upwards through subsurface fractures or micro-fractures to surface. Contamination by oil spills, fuels, and solvents is indicated by soil vapor samples that have high contents of C$_6$+ compounds and plot in the Lower RH Quadrant**.** Samples plotting in the Lower LH and RH Quadrants do not contain evidence of either SCVF or AGM and would not require downhole repair operations.

NG-GC-2 Comments

1) C$_6$+ contents of the soil gas samples are low and are similar to expected baseline readings. Measured combustible gas levels are not the result of near surface hydrocarbon or chemical contamination.