



## Countywide Recycling & Disposal Facility

Division of Republic Services of Ohio II, LLC  
3619 Gracemont Street S.W.  
East Sparta, Ohio 44626  
Phone: 330-874-3855  
Fax: 330-874-2426

November 26, 2008

Mr. Ed Gortner  
Ohio Environmental Protection Agency  
Lazarus Government Center  
50 W. Town St., Suite 700  
Columbus, Ohio 43215

Mr. Paul Ruesch  
US EPA Region 5  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

RE: Request for Information - W-57R  
Countywide Recycling and Disposal Facility, East Sparta, Ohio

Dear Mr. Gortner and Mr. Ruesch:

This letter provides information requested related to landfill gas extraction well W-57R2 at the Countywide Recycling and Disposal Facility (CWRDF), East Sparta, Ohio. This letter summarizes the requested information, initial actions taken, current status and actions, and anticipated activities in response to the event with respect W-57R.

The active landfill gas extraction system is monitored by American Environmental Group Ltd. (AEGL) on behalf of CWRDF. During a routine landfill site inspection conducted by AEGL on Sunday, November 2, 2008, the wellhead and associated lateral piping for well W-57R2 was found to be leaning and partially melted.

The location of W-57R2 is shown on the attached Figure 1 along with the site-wide wellhead temperatures measured in October 2008. This area is at the eastern extent of the area impacted by the ongoing reaction at the facility. Note also that it is at the edge of an area that has been capped with a temporary FML cap (indicated by the heavy dashed green line on Figure 1). Well logs for W-57R2 are presented in Attachment A.

### **Summary of Facts:**

1. During a routine landfill site inspection being conducted by AEGL on Sunday, November 2, 2008, the wellhead and associated piping for W-57R2 was discovered to be leaning over and partially melted.
2. The technician made immediate notifications to his supervisor.
3. The technician investigated the area further and discovered damage to the wellhead and associated vacuum supply lateral. The damage consisted of small melted-through sections of above grade HDPE piping.

4. The geosynthetic well boot and liner was cut away and the wellhead was lifted and removed from the well. A several-foot long section of CVPV well casing material detached below the ground surface. The end of the detached casing appeared to have melted.
5. Upon removal of the wellhead, a flash occurred below the ground surface within the well casing, accompanied by smoke and/or water vapor.
6. Additional senior staff arrived at the site and inspected the open hole – no flames, light, smoke and/or water vapor were observed in the casing at this time.
7. A Phoenix temperature probe was inserted into the casing. The probe reached an obstruction at 12 feet deep. Temperature registered 160 deg. C (320 deg. F) and was still rising when the probe was removed to prevent damaging it.
8. A temporary FML patch was cut, placed, and weighted down over the hole to minimize further potential oxygen intrusion into the landfill.
9. In order to backfill the well with bentonite, the temporary FML patch was removed. Upon removal, smoke and/or water vapor wafted from the hole. However, no flames or light were observed in the casing at this time.
10. The remaining well pipe for W-57R2 was then filled to the surface with dry, granular bentonite, the top couple inches of bentonite was hydrated to effect a seal, and then a geosynthetic patch was welded over the hole, thus abandoning this location, and eliminating local air sources.
11. Fourteen wells and four subcap gas collectors adjacent to W-57R2 (see Table 1, column labeled "Turned Down as of Nov. 2, 2008") were then tuned to reduce vacuum to limit potential oxygen intrusion from adjacent areas.

### **Probable Causes:**

W-57R2 time plots for wellhead temperature, downhole temperature, and carbon monoxide are provided in Attachment B. The well is impacted by the reaction and, as such, exhibits low methane, elevated temperatures, and high carbon monoxide levels. Data values vary widely—possibly due to location at the edge of a reaction-impacted boundary where the well may be susceptible to transient levels. Data from the week before the incident is not noticeably outside the "normal" operational levels for this well. However, the wellhead temperature indicated a significant rise in the October 31 reading, just two days before the incident.

Data from gas extraction wells in the vicinity (see Attachment C) do not suggest local or widespread changed conditions in the area.

Examination of the October 2008 site infrared photograph (see Attachment D) does not show any evidence of subsurface heat at the location of W-57R2.

The well logs for W-57R2 (Attachment A) indicate three pockets of aluminum dross: one at 12 feet deep (2 to 3 feet thick), another at 32 feet deep (about one to two feet thick), and another at 47 feet deep (thickness not noted). The cuttings from the vicinity of the 12-foot deep dross pocket measured 200 deg. F during drilling.

In July 2008, a pump failed in W-57R2 and blocked further access beyond about 12 feet deep (same depth as the warm pocket of dross); since that time, downhole access beyond 12 feet deep has not been possible and that is reflected on the downhole temperature plot provided in Attachment B.

Given the above information, it is the opinion of the Countywide team that the event unfolded as such:

1. The aluminum dross pocket at 12-foot depth was hot upon drilling in June 2007, and may have caused the pump failure and well obstruction at 12-foot depth in July 2008.
2. During the week beginning October 27, 2008 a small air leak developed or enlarged at the boot between the well casing and the temporary FML cap.
3. Air was pulled down along the well casing, and as it entered the dross pocket at 12-foot depth, provided the oxygen needed to initiate a hydrogen-fueled oxidation event, significantly and suddenly raising temperatures at a local level.
4. The heated gas exceeded the melt point for some well components.
5. When the well casing was removed upon discovery, additional oxygen flowed down the well casing producing a quick flash.

It appears that the incident at W-57R2 was isolated and separate from the ongoing reaction. Nevertheless, it is imperative to make sure that the incident is, in fact, isolated. It is also important to monitor and assure that the local symptoms of the incident are arrested. The precautions, enhanced monitoring, and analysis outlined in this letter provide a plan to identify and manage any potential ongoing issues that could result from this incident.

#### **Initial Response Actions:**

1. On Monday, November 3, 2008, Darrin Hartman of AEGL was assigned to coordinate additional efforts and response to the event at W-57R2.
2. A series of surface temperature and settlement monitoring points was established immediately around the well (see Figure 2). Liner surface temperature surveys and ground elevation surveys were initiated at the monitoring points.
3. Extraction rates for 44 landfill gas extraction points (see Figure 1 and Table 1, column labeled "Turned Down as of Nov. 3, 2008") within about 400' of W-57R2 were substantially reduced to limit the potential for oxygen intrusion. Daily monitoring of these 44 wells was initiated.
4. Additional compacted soil was placed over the adjacent liner toe trench and liner tie-in location in order to better seal the surface area and reduce the potential for oxygen intrusion into this area (see Figure 2 for approximate limits of added soil).
5. Overnight visual inspections were conducted.
6. Routine downhole temperature monitoring was conducted in surrounding wells.

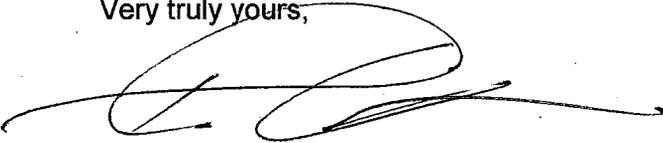
**Current Status and Actions:**

1. Starting on November 10, monitoring, adjustment, evaluation, and historic trending have been modified to incorporate only 15 extraction locations within approximately 200' of W-57R2 (see Figure 1 for locations and Table 1, column labeled "Turned Down as of Nov. 10, 2008"). The monitoring of these 15 locations will be conducted on a 3 times per work week basis (Monday, Wednesday, and Friday). Tuning will be conducted to minimize the potential for oxygen intrusion into the area immediately surrounding W-57R2. See Attachment C for current GEM data graphs for these wells.
2. Wells within the 200' to 400' range are being slowly restored to their original extraction rate. The data from these locations will be reviewed and evaluated for any anomalous data or trends.
3. A surface temperature survey is being conducted on a once per work day basis (M-F). Plots of weekly temperature results to date are included in Attachment E. These plots show the relative temperature differences between a reference section of HDPE liner material (located under the AEG office trailer) and the surface temperature on HDPE temporary cap in the vicinity of W-57R2. Temperatures are obtained pre-dawn to eliminate heating effects of the sun. This data shows a significant week-to-week cooling around the former well location. Frequency of this survey will be reduced when deemed appropriate.
4. Weekly settlement surveys are being conducted and evaluated. The cumulative settlement to date is shown in Attachment F. Settlement less than 0.2 feet may be due to foot traffic or other local surficial disturbances. Those greater than 0.2 feet could indicate consumption of material under the ground surface and should be watched as a possible indicator of local subsurface fire. Examination of Attachment F suggests that some settlement occurred within the first week of monitoring but little to no settlement has occurred since then. The settlement data indicates no active underground material consumption is occurring due to fire.
5. As long as there are no abnormalities noted in the trending and analysis of the monitoring data from the currently monitored 15 well locations, they will slowly be returned to their original extraction rates over a 30 day period.

**Summary and Anticipated Activities:**

1. At present, it appears that the incident at W-57R2 was isolated and unlike and unrelated to the reaction that is occurring to the west of the well location. The event appears to be related to a local, shallow pocket of aluminum dross that overheated due to some local oxygen infiltration source. The dross pocket appears to be reverting to a normal, warm state as evidenced by surface temperature monitoring.
2. Countywide will continue to gradually restore the 15 gas wells surrounding
3. If the monitoring continues to indicate that the area has substantially cooled and that the incident was isolated to the immediate vicinity of W-57R, monitoring will be discontinued upon concurrence with the Ohio EPA and U.S. EPA.
4. At this time, potential replacement of W-57R2 is being reviewed. However, recent capping in the vicinity may obviate the need for that.

Very truly yours,



Tim Vandersall, P.E.  
General Manager

cc: Bud Keim, Canton City Air  
Kurt Princic, OEPA-NEDO  
Todd Hamilton, CWRDF  
Michael Beaudoin, AECOM  
Darrin Hartman, AEG  
Bruce Schmucker, CEG  
Jim Walsh, SCS Engineers

Attachments:

Table 1 – Gas Extraction Points in Vicinity of W-57R2

Figure 1 – Plan Location, W-57R2 Incident, October 2008

Figure 2 – Monitoring Adjacent to W-57R2

Attachment A - Well Logs for W-57R2

Attachment B – Data Plots for W-57R2

Attachment C – Data Plots for Gas Extraction Wells Near W-57R2

Attachment D – Infrared Photo, October 24, 2008

Attachment E – Local Surface Temperature Survey Results

Attachment F – Local Settlement Survey Results

Table 1

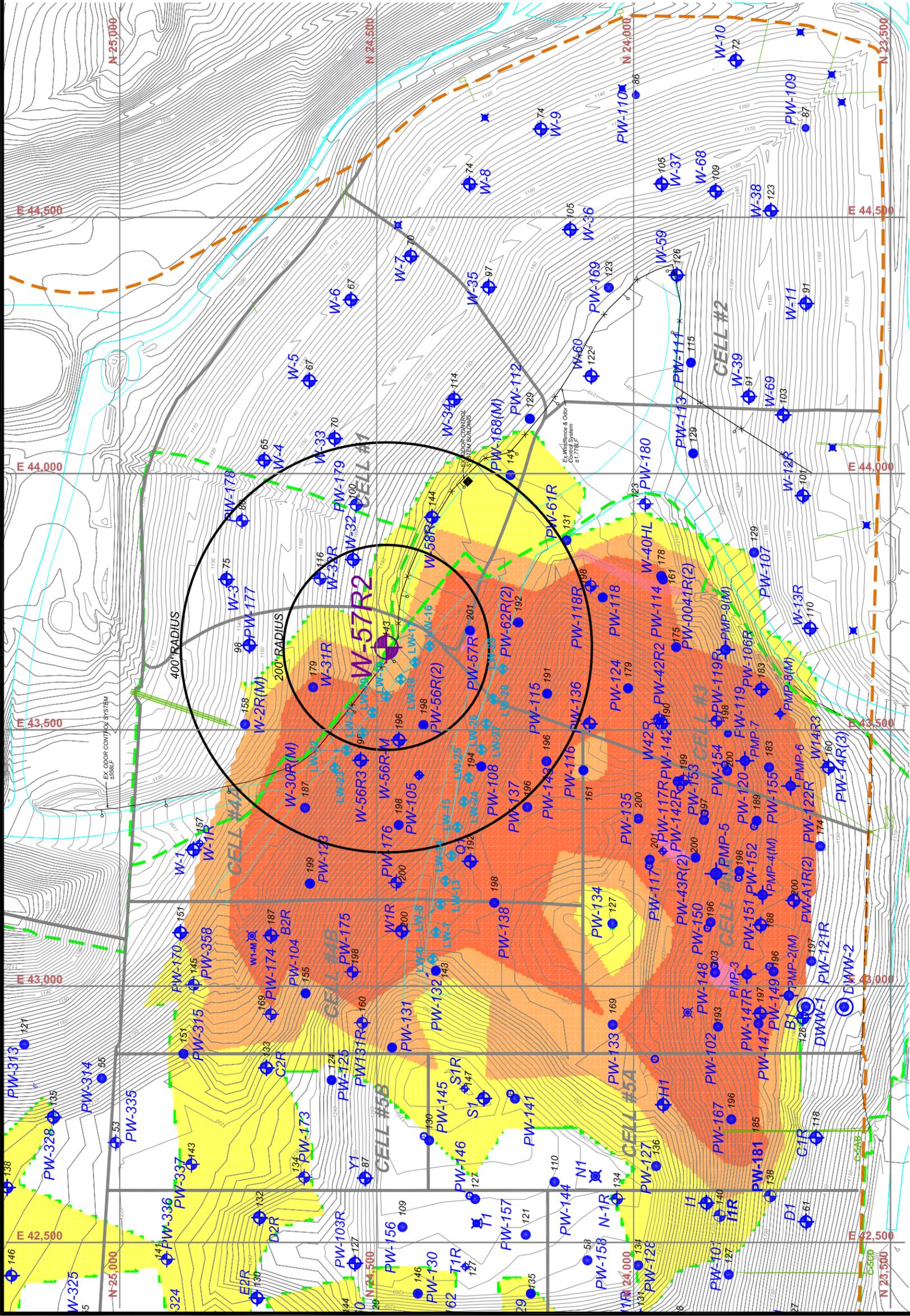
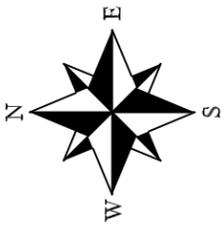
## Gas Extraction Points in Vicinity of W-57R2

	Turned Down as of Nov. 2, 2008	Turned Down as of Nov. 3, 2008	Turned Down as of Nov. 10, 2008	Description of Extraction Point
DH-01	X	X		Subcap horizontal
DH-02	X	X		Subcap horizontal
DH-03	X	X		Subcap horizontal
DH-04	X	X		Subcap horizontal
LS-1		X		Leachate sump
LS-4		X		Leachate sump
LS-5		X		Leachate sump
LW-15		X		Leachate well
LW-16	X	X	X	Leachate well
LW-17	X	X	X	Leachate well
LW-18	X	X	X	Leachate well
LW-19	X	X	X	Leachate well
LW-20	X	X	X	Leachate well
LW-21	X	X	X	Leachate well
LW-22		X		Leachate well
LW-23		X		Leachate well
LW-24		X		Leachate well
LW-25		X		Leachate well
LW-26		X		Leachate well
LW-27		X		Leachate well
LW-28		X		Leachate well
LW-29		X		Leachate well
PW-105		X		Gas extraction well
PW-108		X		Gas extraction well
PW-115		X		Gas extraction well
PW-118R		X		Gas extraction well
PW-137		X		Gas extraction well
PW-143		X		Gas extraction well
PW-168(M)		X		Gas extraction well
PW-177	X	X	X	Gas extraction well
PW-178	X	X		Gas extraction well
PW-179	X	X	X	Gas extraction well
PW-56R(2)		X	X	Gas extraction well
PW-57R	X	X	X	Gas extraction well
PW-61R		X		Gas extraction well
PW-62R		X		Gas extraction well
W-2R(M)	X	X		Gas extraction well
W-3		X		Gas extraction well
W-30R(M)		X		Gas extraction well
W-31R	X	X	X	Gas extraction well
W-32R	X	X	X	Gas extraction well
W-56R(3)		X	X	Gas extraction well
W-56R-M		X	X	Gas extraction well
W-58R	X	X	X	Gas extraction well

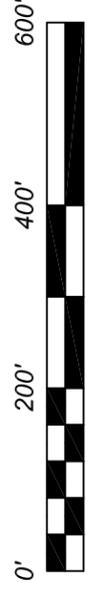
**WELL TEMPERATURE  
COLOR LEGEND**

Temp Zone(°F)

- Greater Than 131 (18.17 Acres)
- Greater Than 150 (6.91 Acres)
- Greater Than 170 (17.37 Acres)
- Greater Than 200 (0.12 Acres)



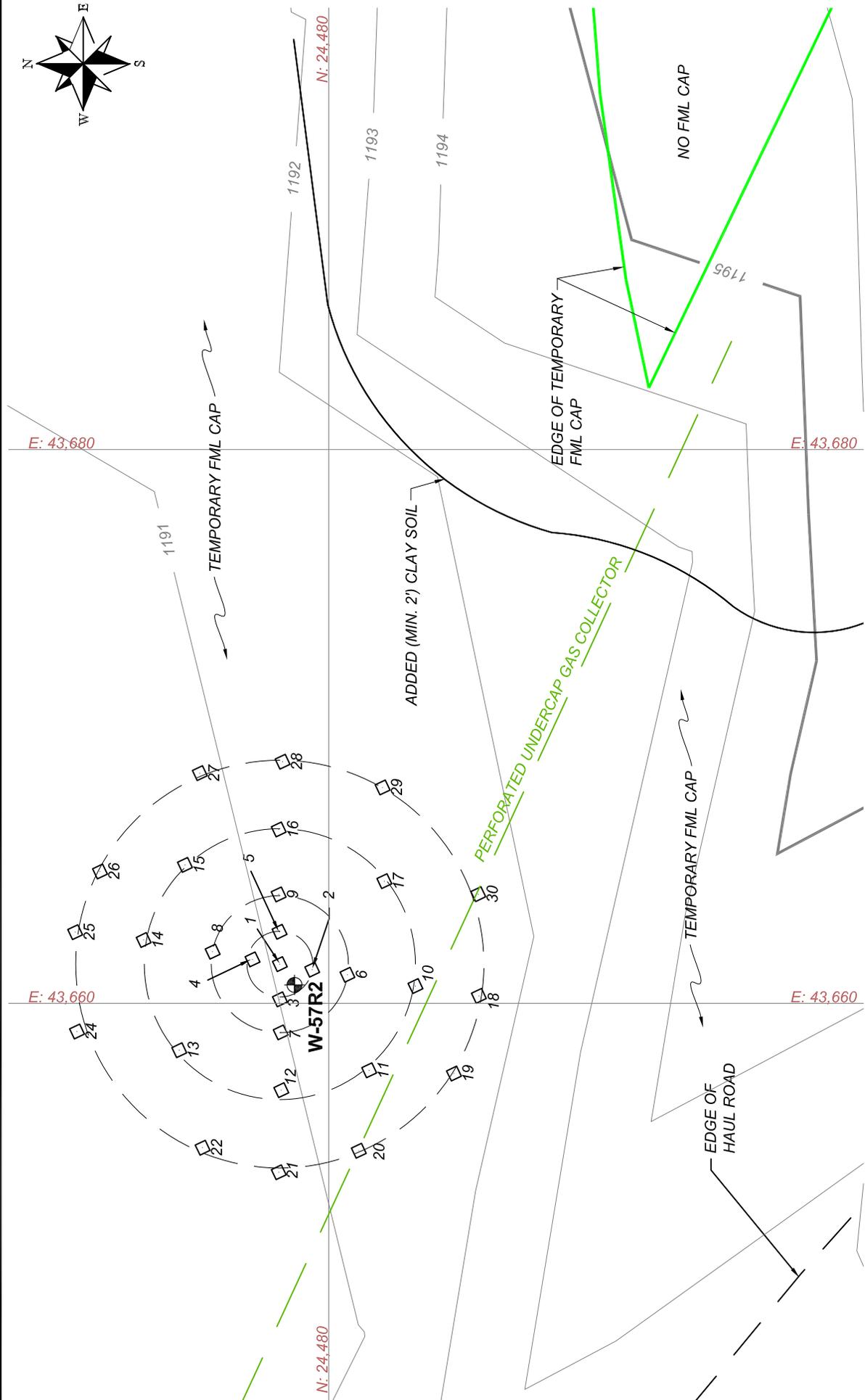
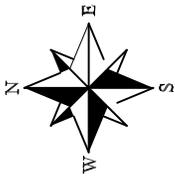
Scale: 1 in. = 200 ft.



Graphic Scale

**COUNTYWIDE RDF**

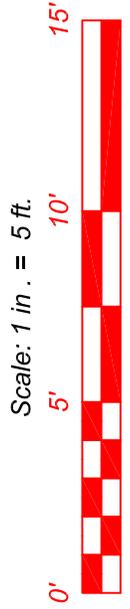
SCALE: 1"=200', CTR="2"	PROJECT:	GAS CONTROL COLLECTION SYSTEM
SURVEYED:	REVISIONS:	
DRAWN: CRH 1/17/09	CHECKED: BMS 1/17/09	
REVISOR DATE: 1/17/09		
SHEET TITLE:		W-57R2 INCIDENT OCTOBER 2008
FILE ID:		W-57R2 Incident October 2008.dwg
		235 Fair Avenue, N.E. New Philadelphia, Ohio 44663 Phone: (330) 344-4411 Fax: (330) 344-4831 e-mail: info@diversified-eng.com



# COUNTYWIDE RDF

REVISIONS	
SCALE: 1"=5', CTR INT=1"	
SURVEYED: CWH 11-21-08	
DRAWN: BMS 11-21-08	
CHECKED: BMS 11-21-08	
REVISED DATE:	

PROJECT: W-57R(2) - INCIDENT  
 SHEET TITLE: MONITORING POINTS PLAN VIEW  
 PHONE: (609) 364-1631  
 E-MAIL: info@diversifiedeng.com  
 225 Fair Avenue, NE  
 New Philadelphia, Ohio 44663  
 FILE ID: W57R2.dwg  
 FIGURE 2



Graphic Scale

# ATTACHMENT A



American  
Environmental  
Group Ltd.

## Well Log

PROJECT NAME COUNTY WIDE LANDFILL

DATE: FRI 6/8/2007

PROJECT# \_\_\_\_\_

Drilling	Well Wash
57 R-2 WELL NUMBER OR NAME	
80 LINEAR FEET OF DRILLING	
80 LINEAR FEET OF COMPLETION	
0 FT LINEAR FEET OF ABANDONMENT	
Time in: 7 00 AM Time out: 12 00 PM	
Weather conditions: WARM SUNNY	
Site conditions:	
Rig hrs:	
Service: Radiator Grease	
NOTES:	
Total Benching Time: 0 hr	

Monitoring Log				Well Benching Log					
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp	
7 00	20.9	0	0	0-1	soil cover	none	dry	none	
8 00	20.9	0	0	1-5	trash paper	slight	dry	95	
9 00	20.9	0	0	5-10	dross at 12 feet	slight	dry	200	
10 00	20.9	0	0	10-20	trash paper wood	slight	dry	165	
11 00	20.9	0	0	20-30	trash wood metal	moderate	dry	121	
12 00	20.9	0	0	30-40	trash paper wood	moderate	dry	156	
				40-50	dross at 47 feet	moderate	dry	170	
				50-60	trash plastic	heavy	moist	152	
				60-70	trash black dirt	moderate	moist	133	
				70-80	trash wood plastic	heavy	moist	127	
Notes									

  
 CLIENT REPRESENTATIVE 6/12/07  
 DATE  
Paul Hake Sr. Field Tech GAZ  
 NAME & TITLE

TIM BURGY SR. FRI 6/8/2006  
 AEGL SITE SUPERVISOR DATE



American  
Environmental  
Group Ltd.

# DAILY DIARY

DATE: fri 6/8/2007

PROJECT NAME COUNTY WIDE LANDFILL  
PROJECT# \_\_\_\_\_

		CONSTRUCTION	
<u>80</u> LINEAR FEET OF DRILLING		HEADER # _____	PIPE DIA. _____
<u>0</u> LINEAR FEET OF DRILLING Abandonment		STATION _____	LINEAR FT. _____
<u>80</u> LINEAR FEET OF WELL COMPLETION		TRENCH DEPTH _____	
PERFORATED PIPE-DIA. <u>6"</u> HDPE SDR 11		HEADER # _____	PIPE DIA. _____
SOLID PIPE -DIA. <u>6"</u> HDPE SDR 11		STATION _____	LINEAR FT. _____
		TRENCH DEPTH _____	
COMPLETION: (WELL NUMBERS)		SUBHEADER # _____	PIPE DIA. _____
WELL 57 R-2 TD 80 FEET		STATION # _____	LINEAR FT. _____
		TRENCH DEPTH _____	
		LATERAL: # _____	PIPE DIA. _____
		STATION _____	LINEAR FT. _____
		RISER HEIGHT _____	TRENCH DEPTH _____
GENERAL INFORMATION		LATERAL: # _____	PIPE DIA. _____
WEATHER CONDITIONS <u>SUNNY WARM</u>		STATION _____	LINEAR FT. _____
		RISER HEIGHT _____	TRENCH DEPTH _____
		LATERAL: # _____	PIPE DIA. _____
		STATION _____	LINEAR FT. _____
		RISER HEIGHT _____	TRENCH DEPTH _____
START TIME <u>6 00 AM</u>		SUMPS _____	VALVES _____
STOP TIME <u>5 00 PM</u>			

COMMENTS: TIM BURGY SR AND TIM BURGY JR ARRIVED ON SITE 6 00 AM HAD A TAIL GATE SAFETY MEETING  
SET UP ON WELL 57 R-2 DRILLED TO 12 FEET AND DRILLED UP SOME DROSS BEN TOOK SAMPLES DRILLED  
TO 47 FEET MORE DROSS WAS DRILLED UP BEN TOOK MORE SAMPLES DRILLED TO 80 FEET TD SET AND  
COMPLETED CLEANED UP TRASH HAD TO CHANGE A HYDRAULIC LINE ON DRILL RIG BY THE TIME THAT WAS DONE  
IT STARTED STORMING LEFT SITE AT 5 00 PM.

[Signature]  
CLIENT REPRESENTATIVE  
Ben Haley Sr Field Tech  
NAME & TITLE

[Signature]  
DATE

TIM BURGY SR fri 6 8 2007  
AEGL SITE SUPERVISOR DATE

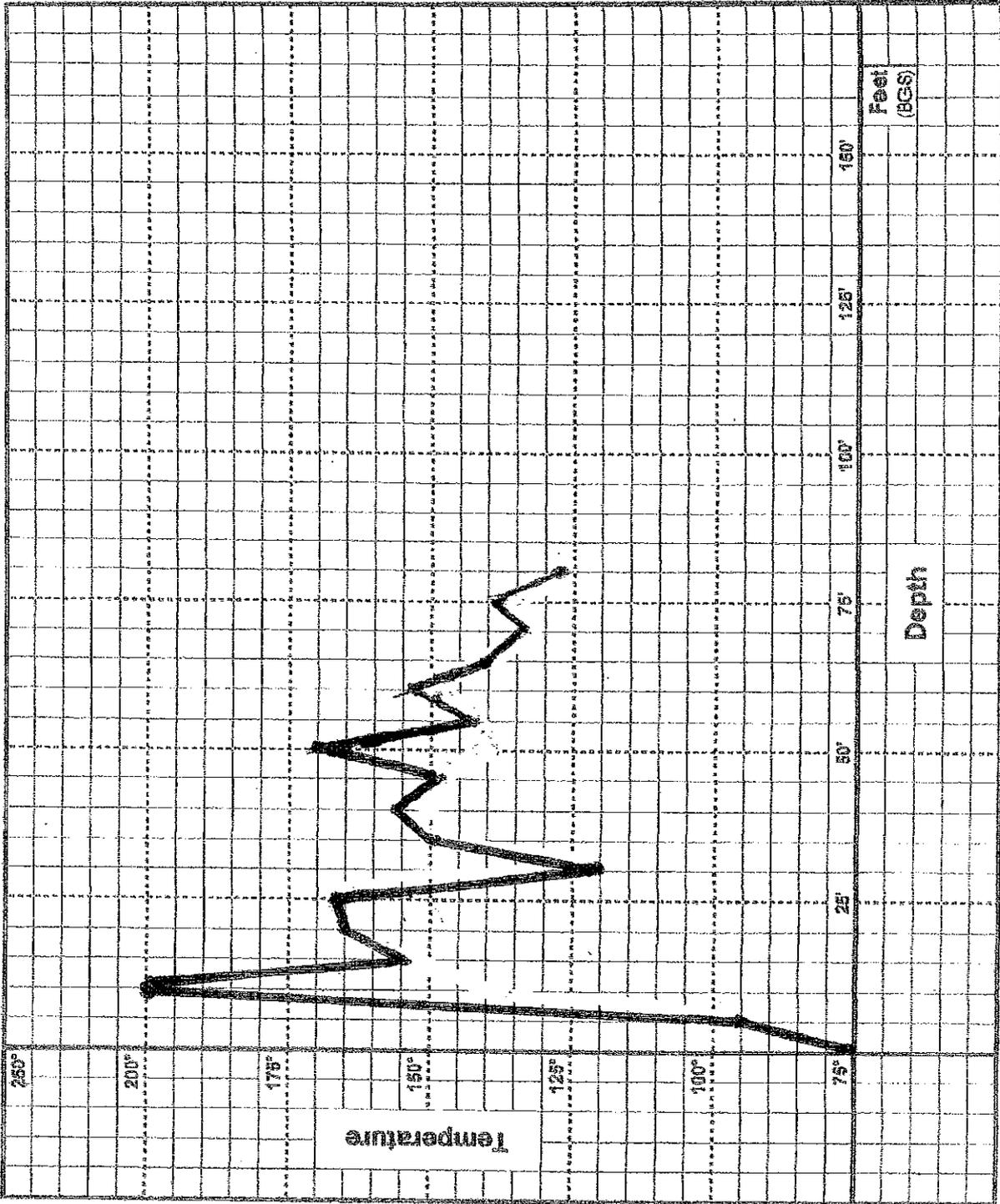
# GAS EXTRACTION WELL BORING LOG

Project Location: CWRDF/East Sparta, OH	Northing: 24480.55
Site Project No.	Easting: 43660.30
Golder Job No. 043-8072.003 Phase 0007	Gr Elev.: 1192.84
Gas Well No. W-57 R(2)	Eng./Tech: Ben Hale
Drilling Date/Time 06-08-07 730-1650	Driller: Tim Burgy

DEPTH	MATERIAL DESC.	COMPOSITION	WET/DRY	AGE	TEMP (F)
0 - 1	Cover	Clay soil	Dry		N/A
1 - 5	HHT, P, PL	Slight	↓		95
5 - 10	↓			200	
10 - 15	HHT, P, PL, AD, W, M	↓		*06/30-97	154
15 - 20	HHT, WR, P, PL, M	Moderate		165	
20 - 25	↓			167	
25 - 30	HHT, WR, P, PL, AD			121	
30 - 35	HHT, P, PL, P, W, AD			150	
35 - 40	HHT, P, PL			156	
40 - 45	HHT, AD, P			148	
45 - 50	HHT, PL, P, W	↓		↓	170
50 - 55	HHT, PL, P, W	Heavy	Moist	142	
55 - 60	HHT, PL, P, W	Heavy	↓	152	
60 - 65	HHT, PL, P, W	Moderate		140	
65 - 70	HHT, PL, P, W	↓		133	
70 - 75	HHT, PL, P, W	Heavy		137	
75 - 80	HHT, PL, P, W	Heavy		127	
80 - 85					
85 - 90					
90 - 95					
95 - 100					
100 - 105					
105 - 110					
110 - 115					
115 - 120					

**General Comments:**

Aluminum Dross encountered @ 12'. Dross Layer approximately 2-3'.  
 Aluminum Dross encountered @ 32'. Dross layer approximately 1-2' deep.  
 Check Temp's. Encountered add'l Dross @ 45'. Dross mat'l sampled  
 AT ALL ELEVATIONS of discovery.  
 P - Paper, PL - Plastic, W - wood, M - metal, WR - Wire, AF - Auto Shut,  
 HHT - Household Trash, AD - Aluminum Dross



Subject: W-57 R (2)	
Made by: Ben Hale	Checked by:
Reviewed by:	
Date: 06-08-07	Sheet of

<b>Goldier Associates</b>
---------------------------

# GAS EXTRACTION WELL BORING LOG

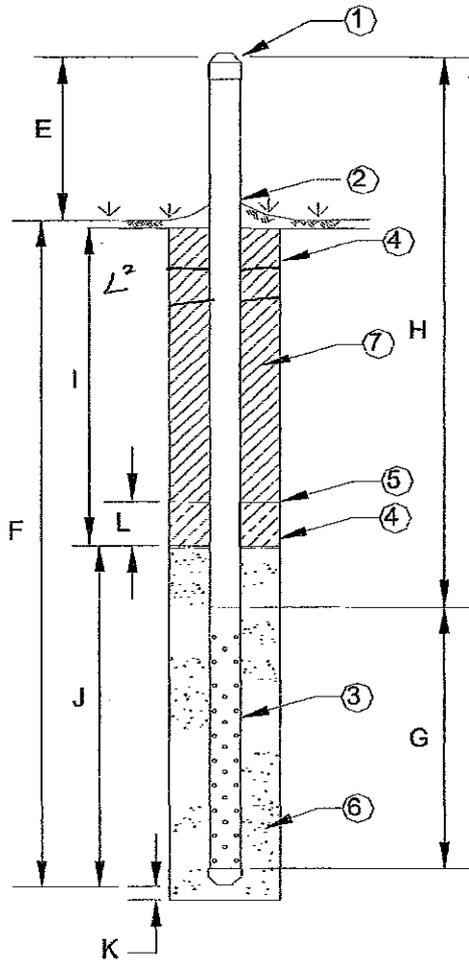


Project Location: **Countywide Landfill/ East Sparta, OH**  
 Site Project No. \_\_\_\_\_  
 Golder Job No.- **043-8072.003 Phase 0007**

Northing 24486.55  
 Easting 43660.30  
 Gr Elev. 1192.89

Gas Well No W57R(2)  
 Drilling Date/Time 06-08-07

Eng./Tech: Ben Hale  
 Driller: Tim Burgy



## Materials List

1. End cap
2. Solid pipe
3. Perforated Pipe
4. Bentonite Seal
5. Geotextile (optional)
6. Natural Stone 1"-3"
7. Clean Backfill

## Specifications

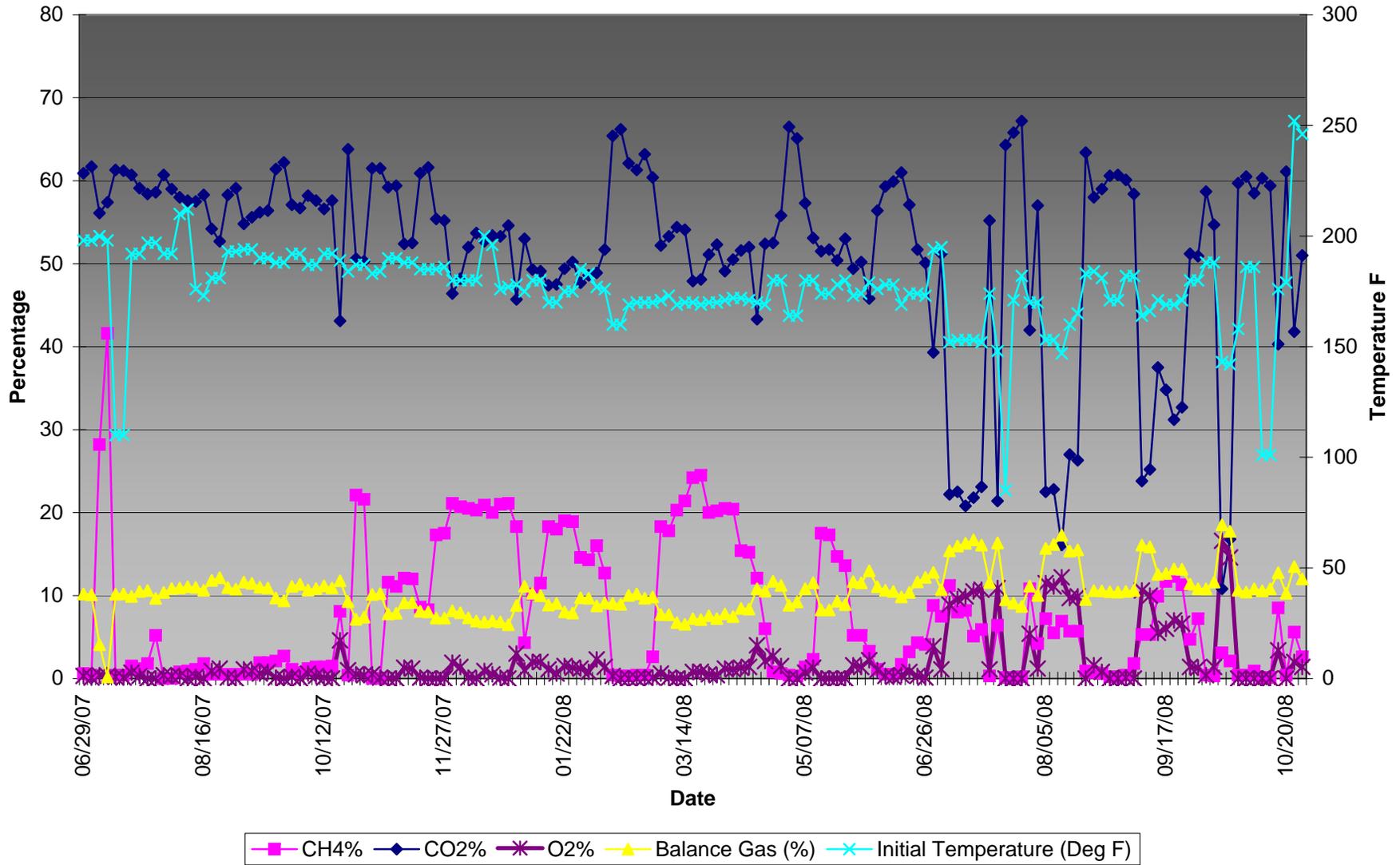
A - Bore Size	<u>36"</u>
B- Pipe Size	<u>6"</u>
C- Pipe Type	<u>CPVC</u>
D- Bore Depth	<u>80'</u>
E- Pipe above ground	<u>4'</u>
F- Pipe below ground	<u>79'</u>
G- Perf pipe length	<u>59'</u>
H- Solid pipe length	<u>24'</u>
I - Cover depth	<u>20'</u>
J- Stone backfill	<u>60'</u>
K- Stone base	<u>12"</u>
L- Bentonite Seal	<u>2 Seals Placed</u>
Refuse depth	<u>91.64</u>
Leachate depth	<u>N/A</u>
Total pipe length	<u>83'</u>
Average refuse temp.	<u>141°F</u>

## General Comments:

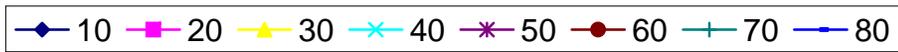
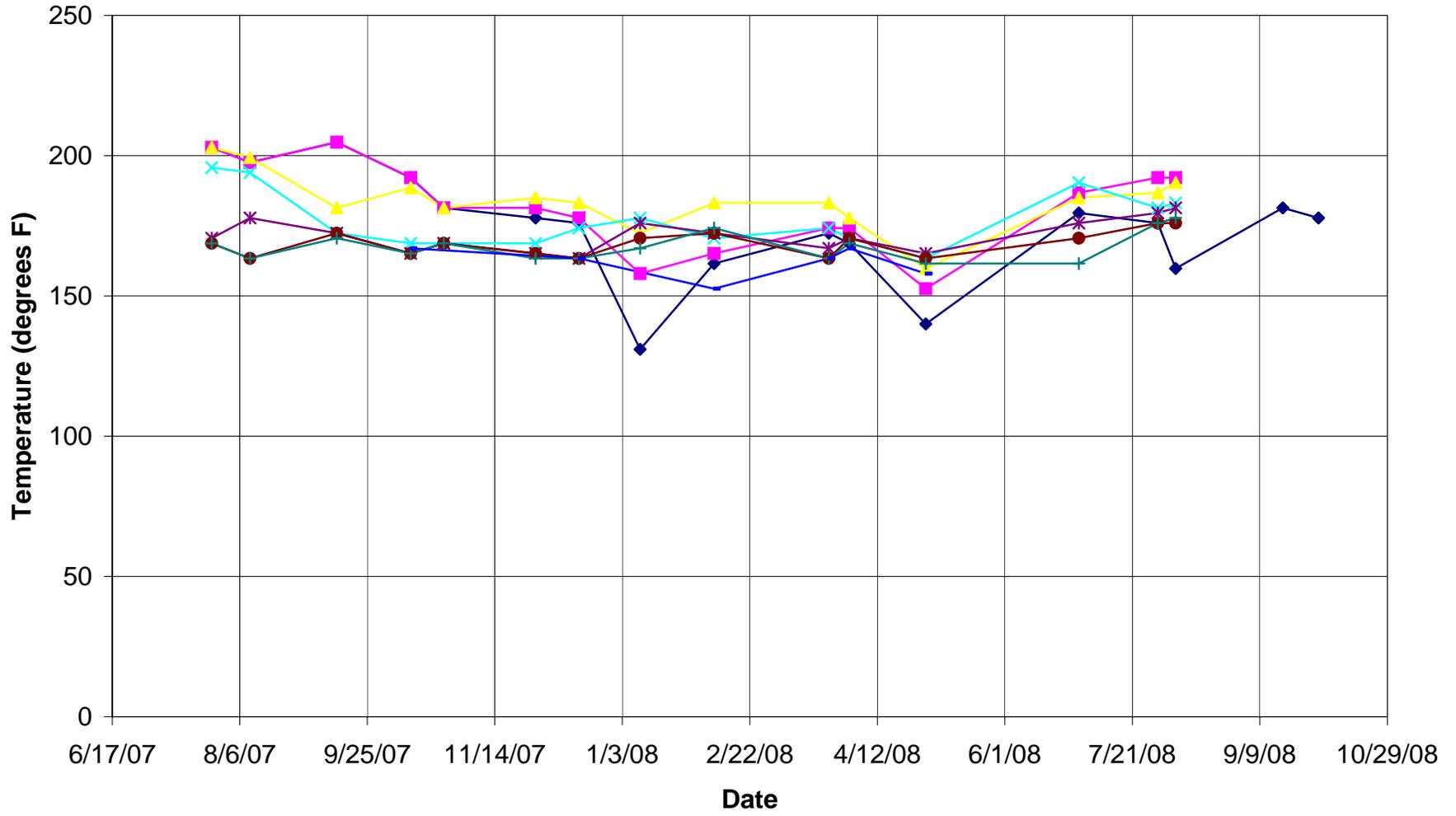
Specification for L : 6 bags of bentonite, hydrated.  
 Specification for L<sup>2</sup> : 12 bags of bentonite, hydrated.

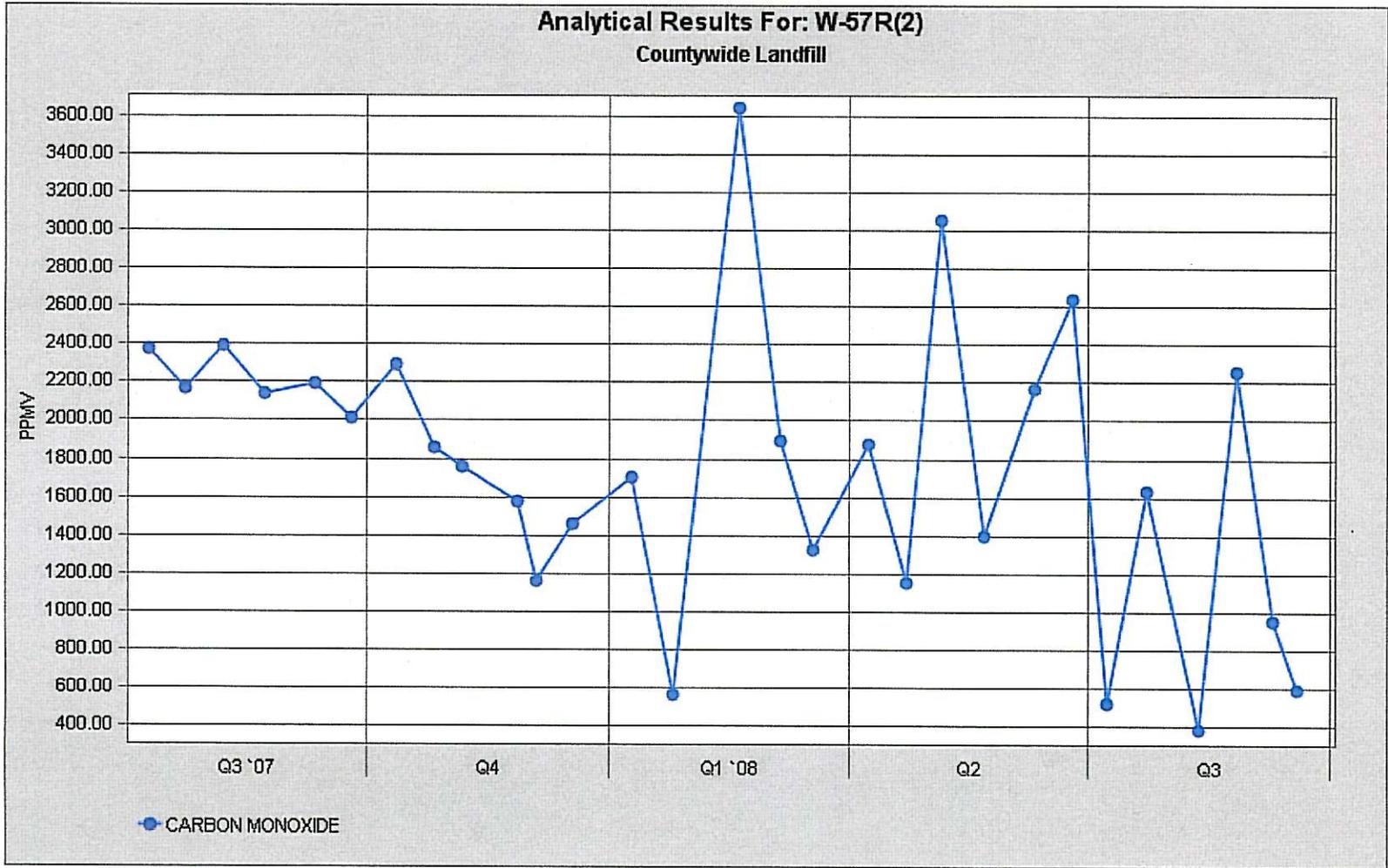
# ATTACHMENT B

W-57R(2)



# W-57R2 Downhole Temperature

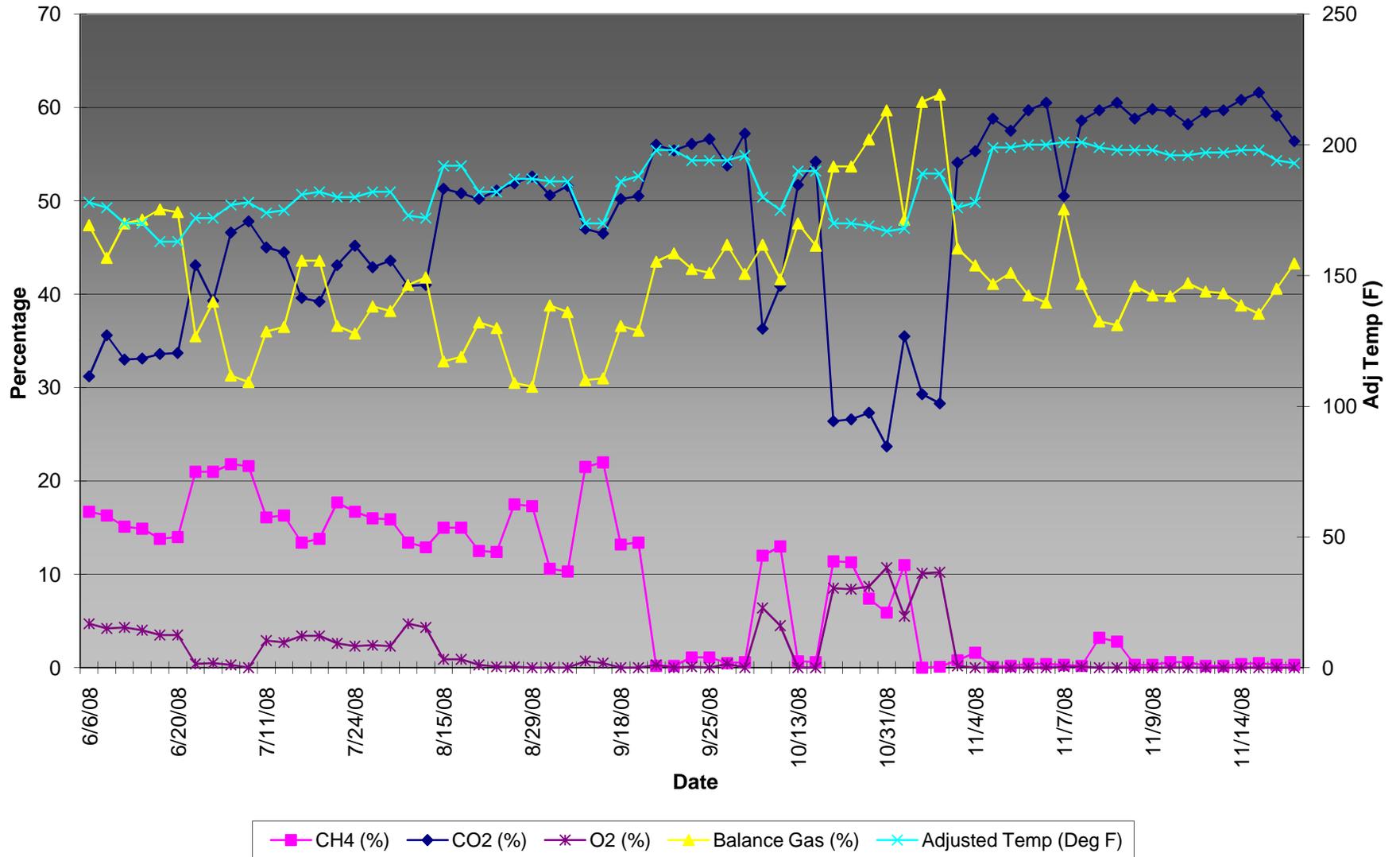




# ATTACHMENT C

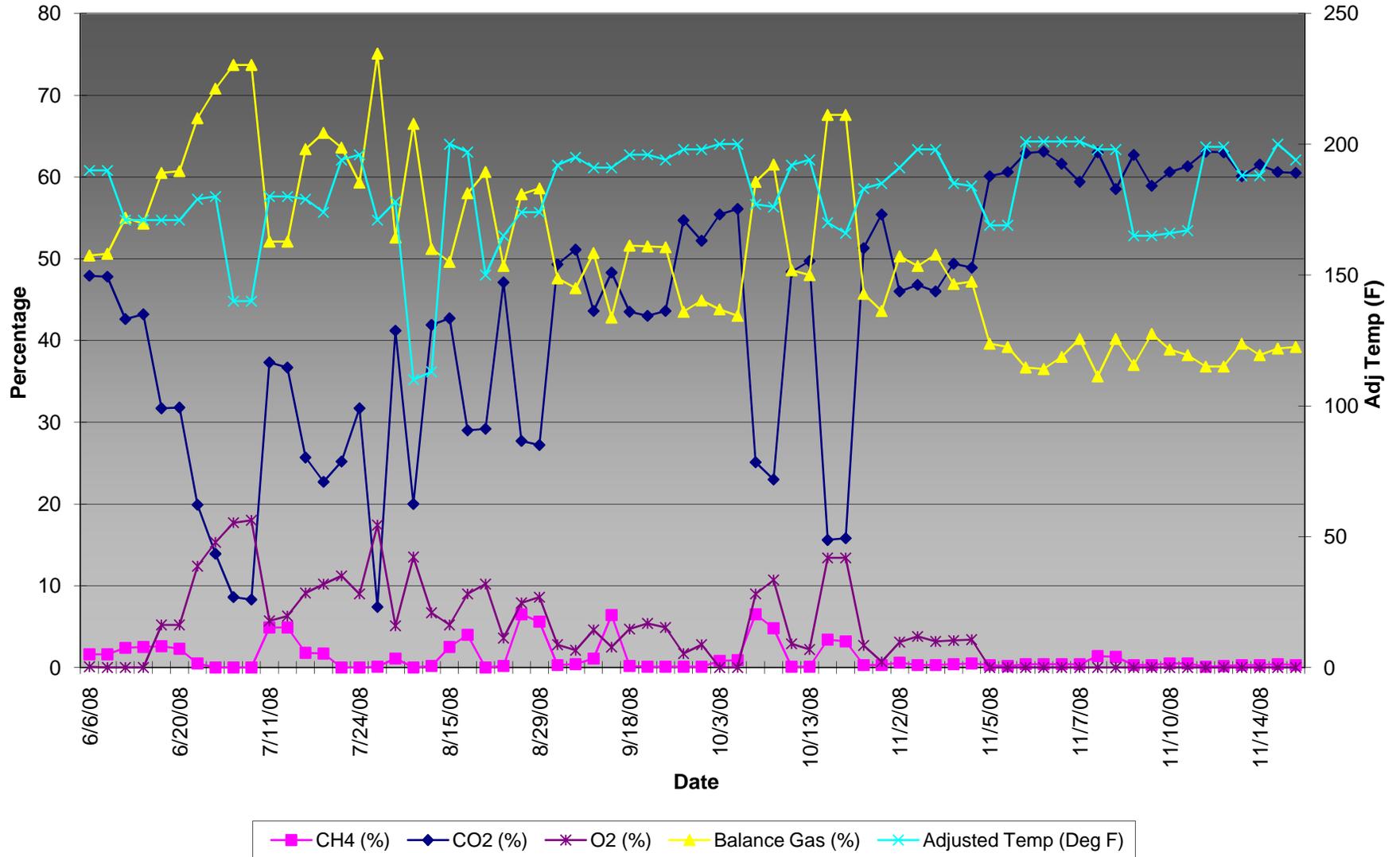
LW-16 Graph

LW-16



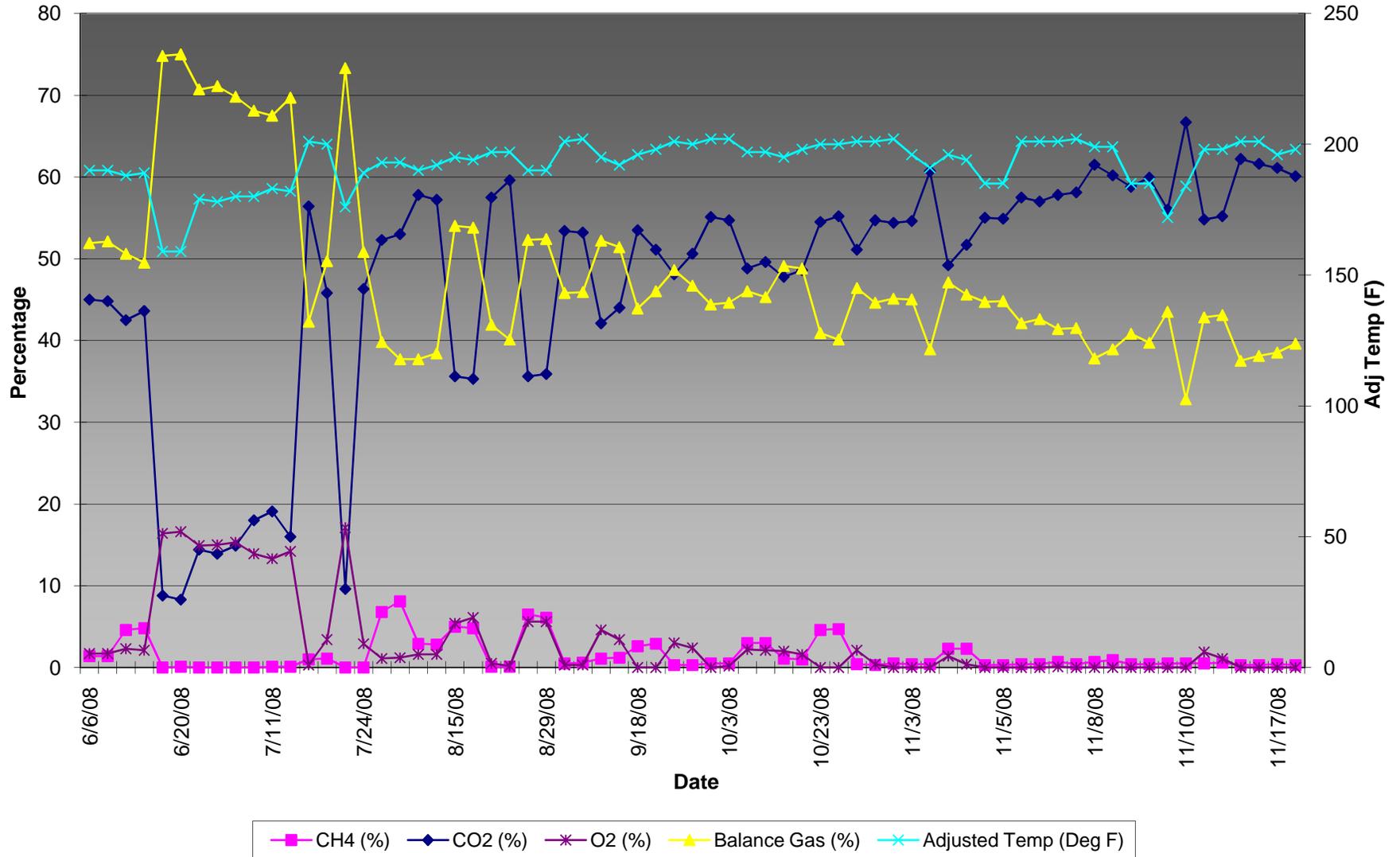
LW-17 Graph

LW-17

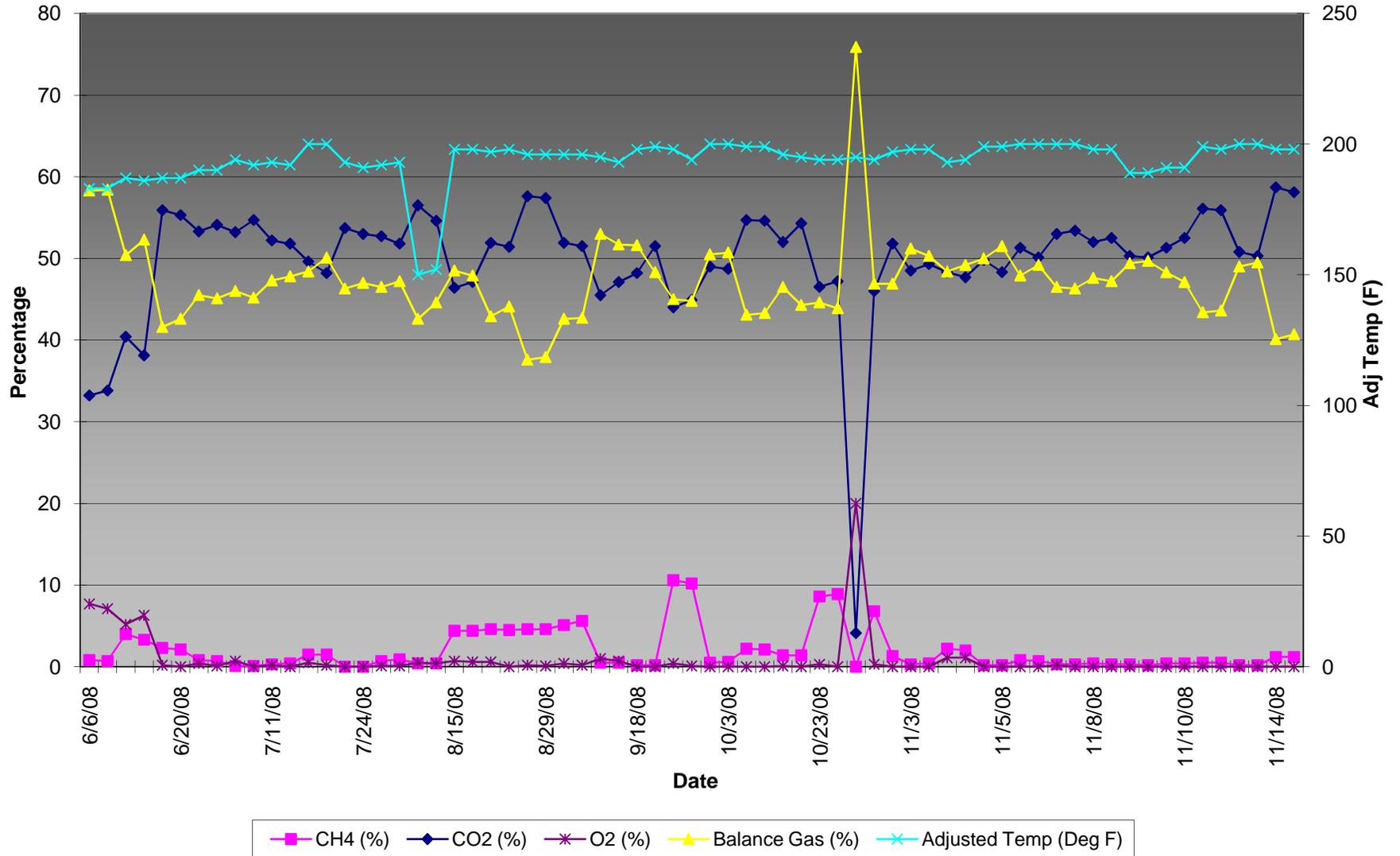


LW-18 Graph

LW-18

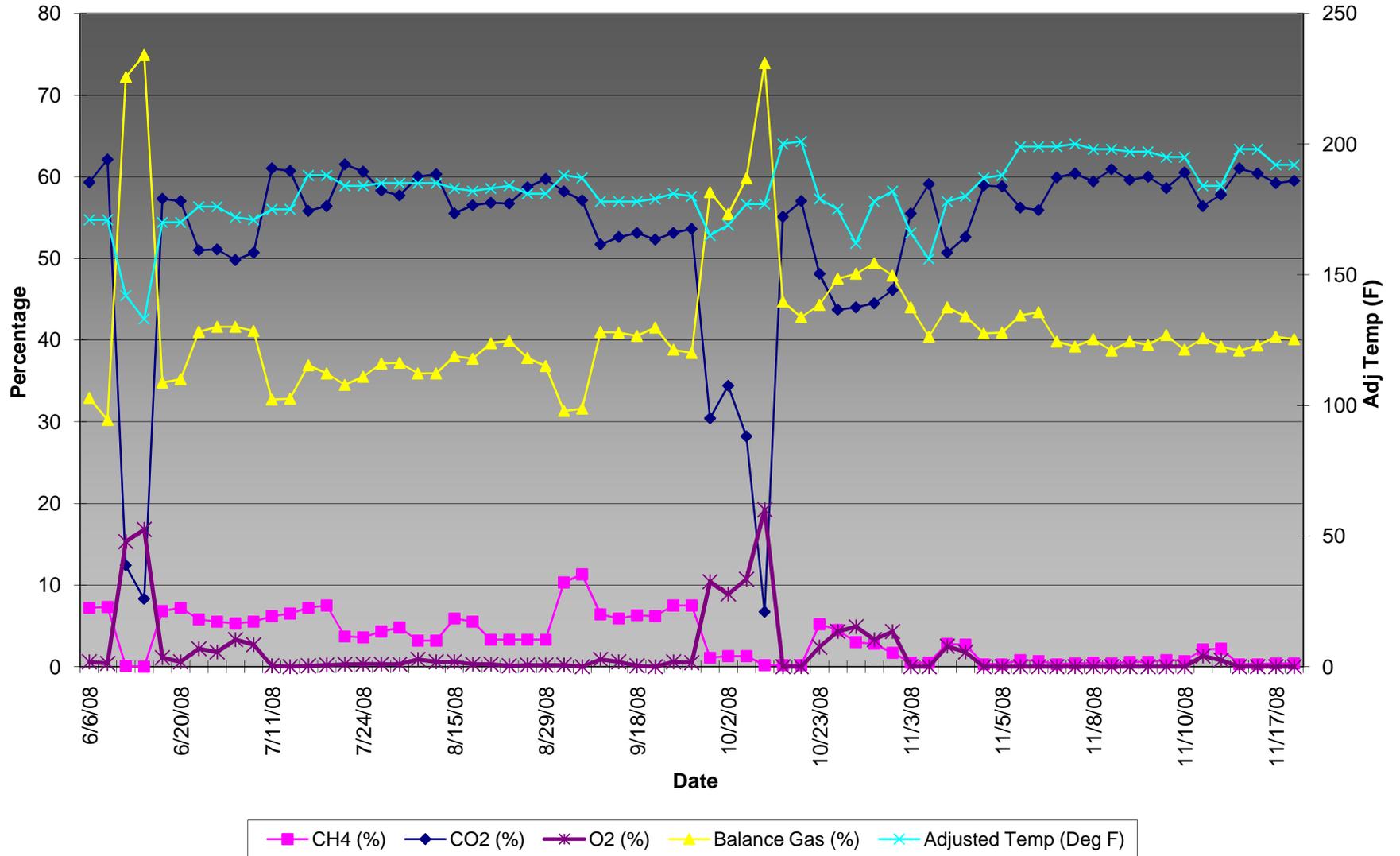


### LW-19



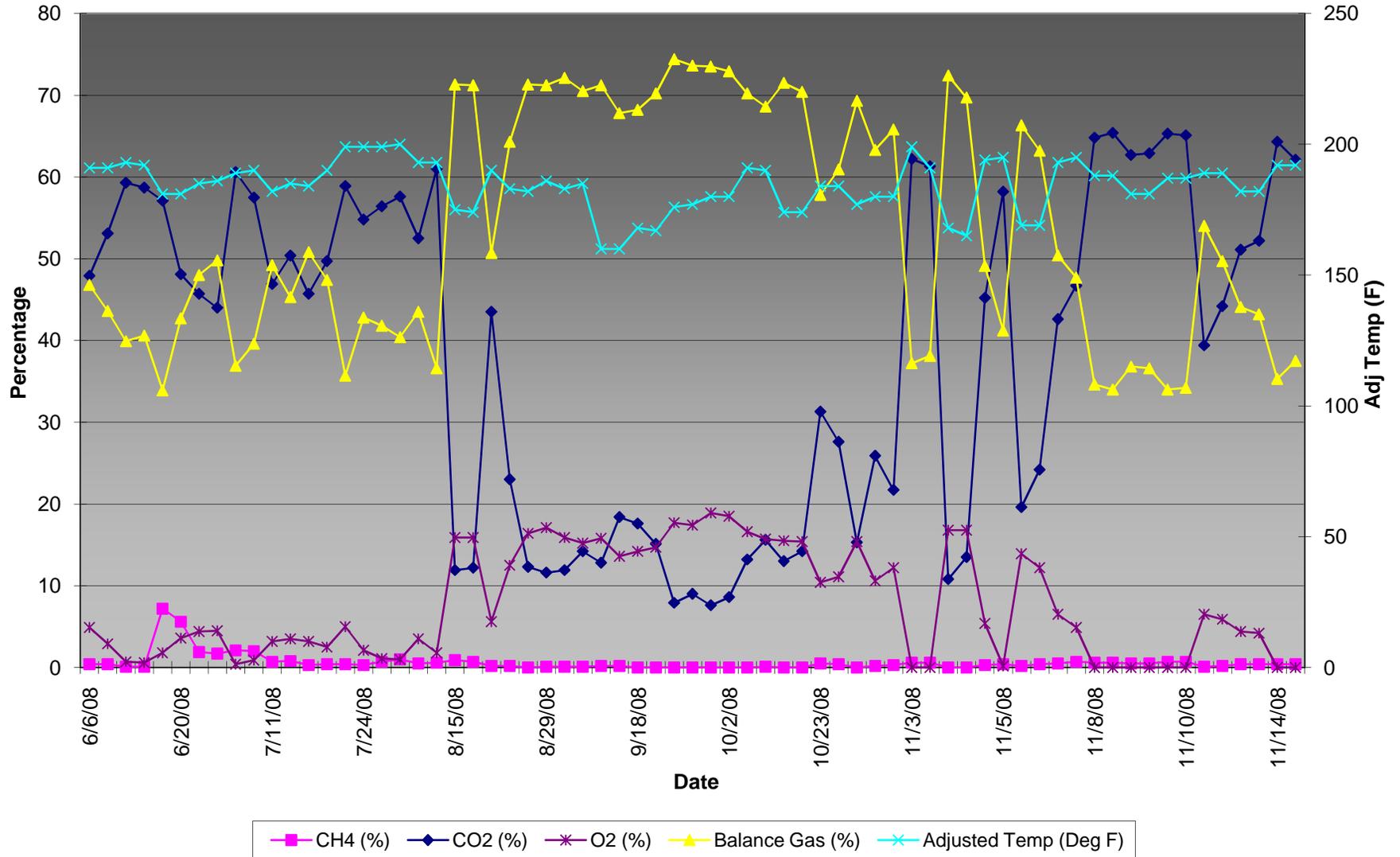
LW-20 Graph

LW-20

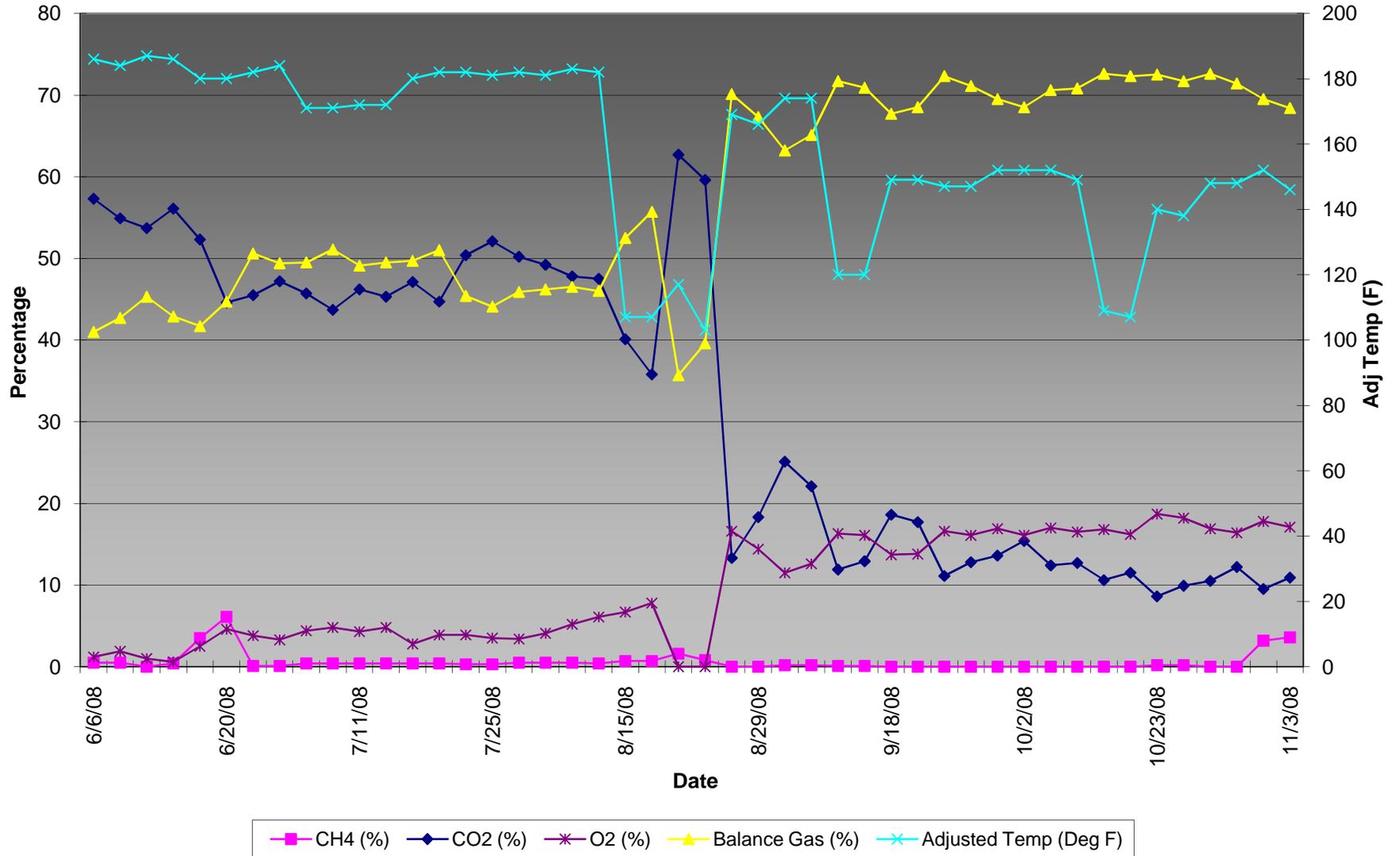


LW-21 Graph

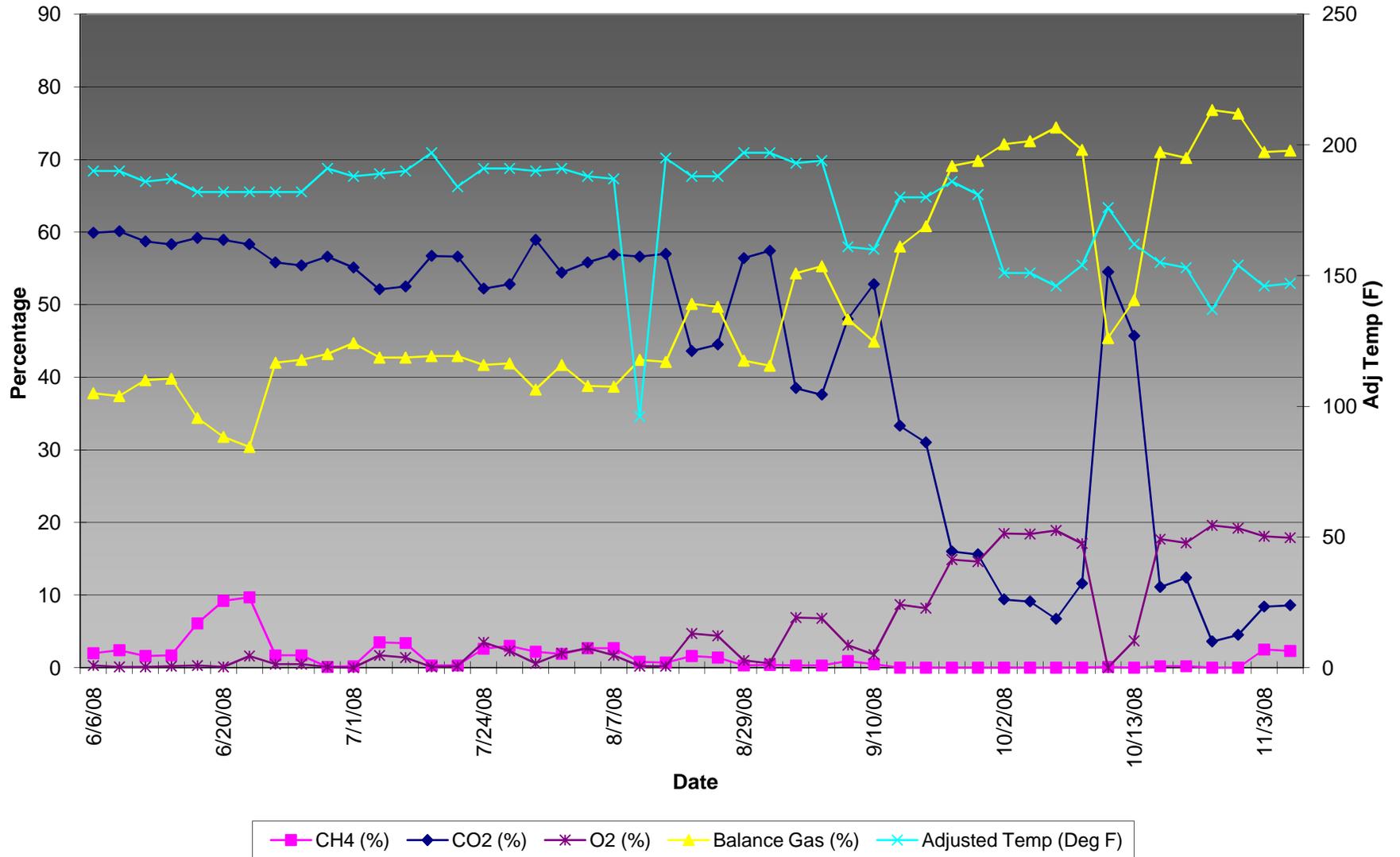
LW-21



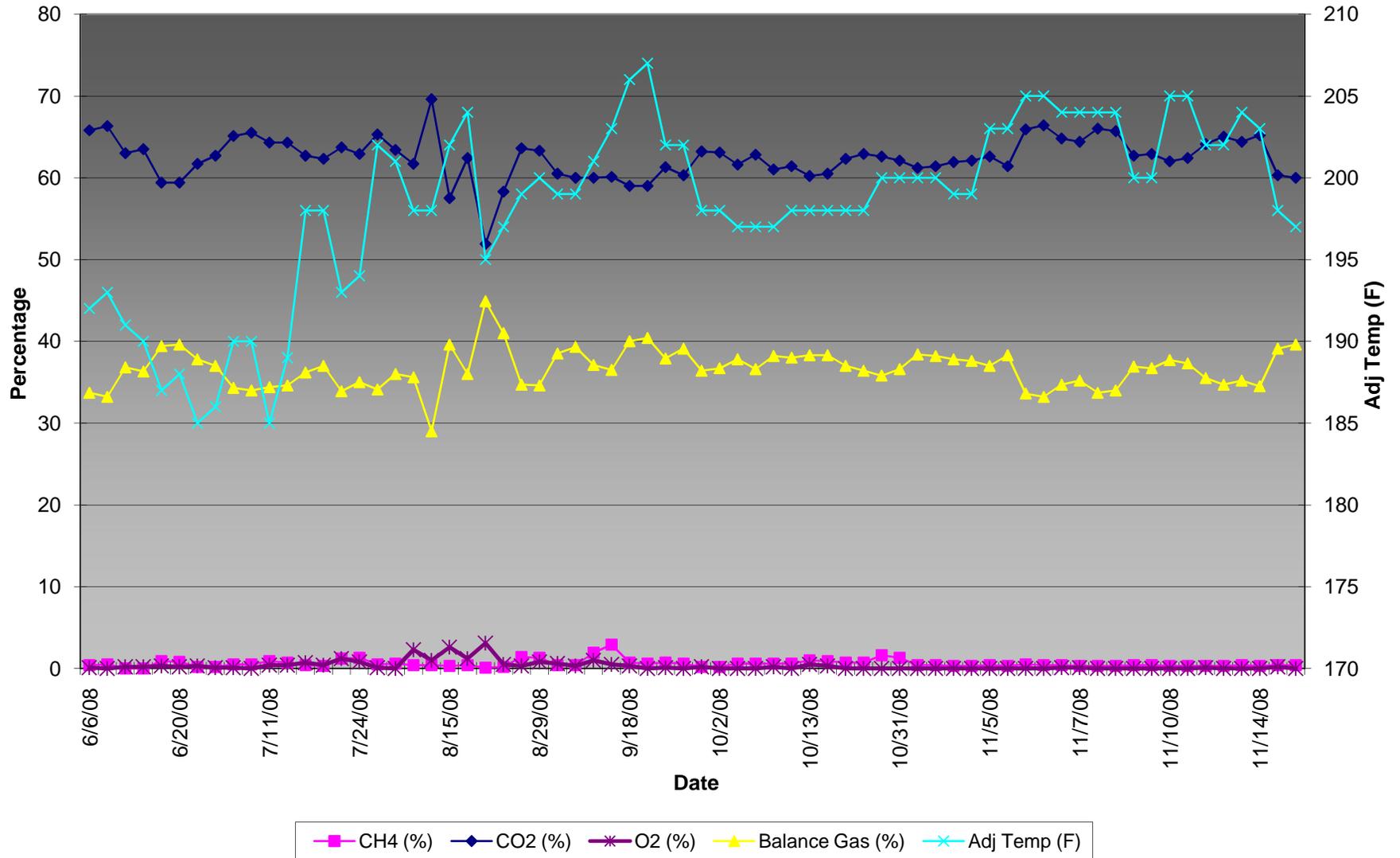
LW-22



LW-23

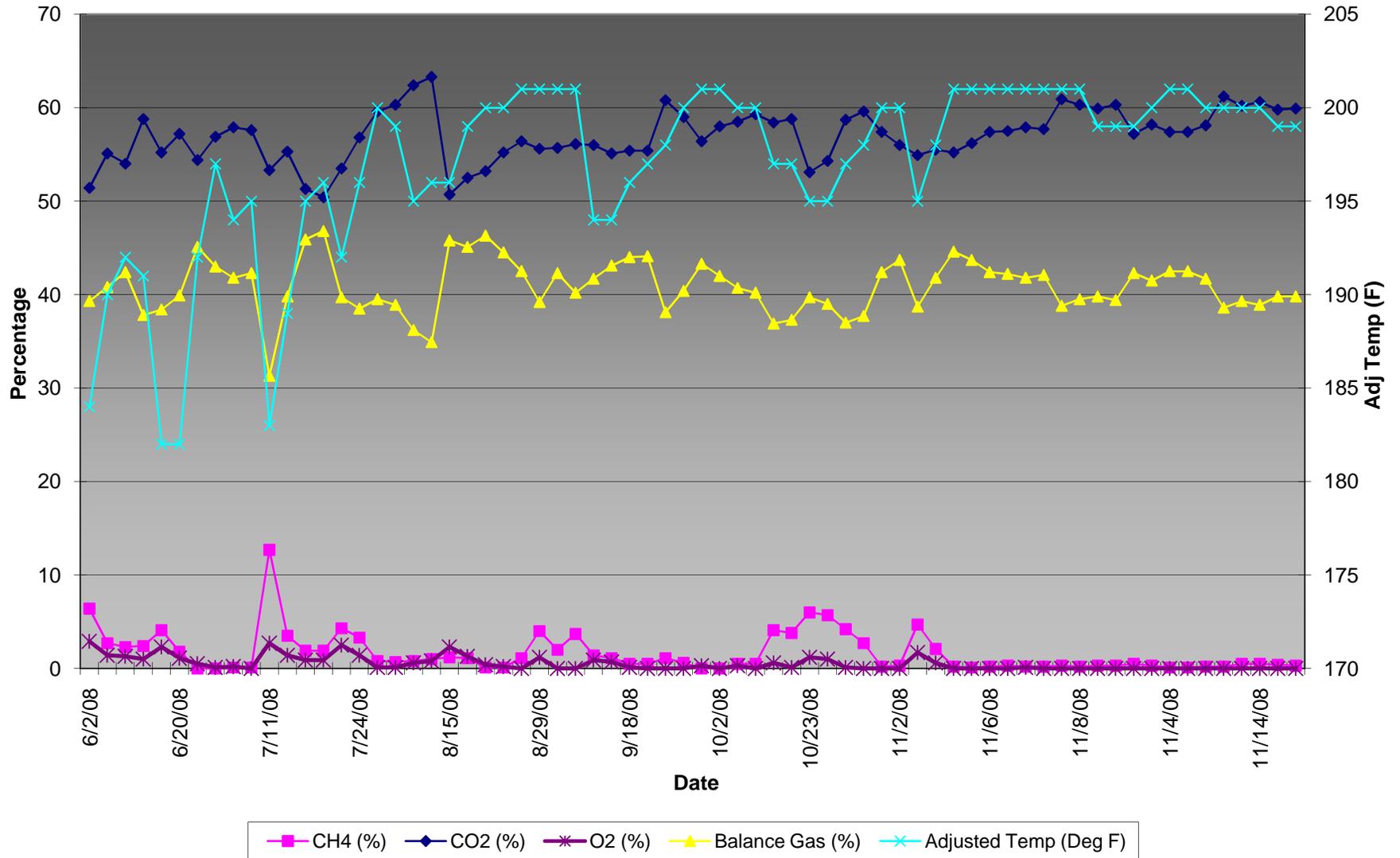


### PW-56R(2)

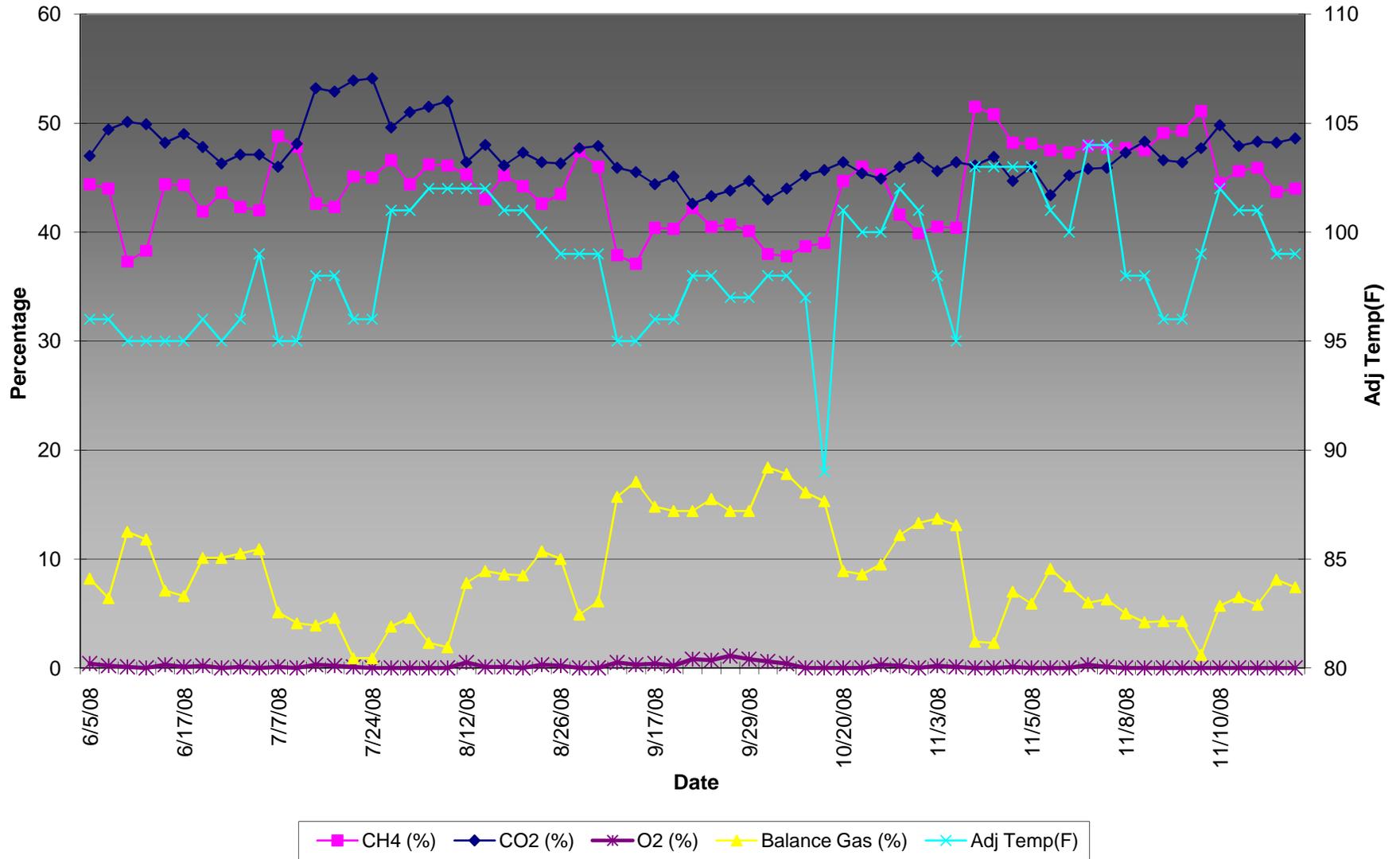


PW-57R Graph

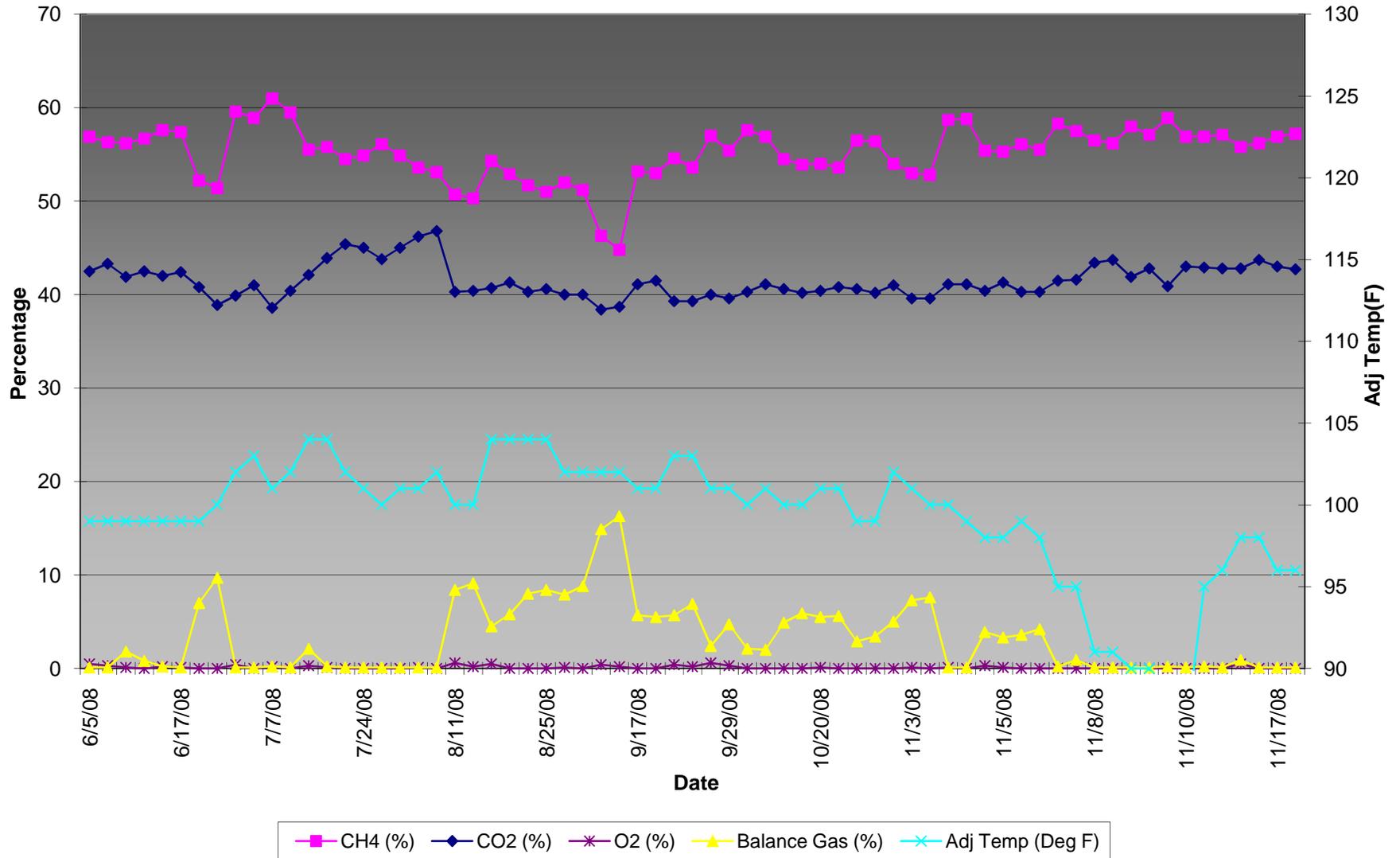
PW-57R



PW-177

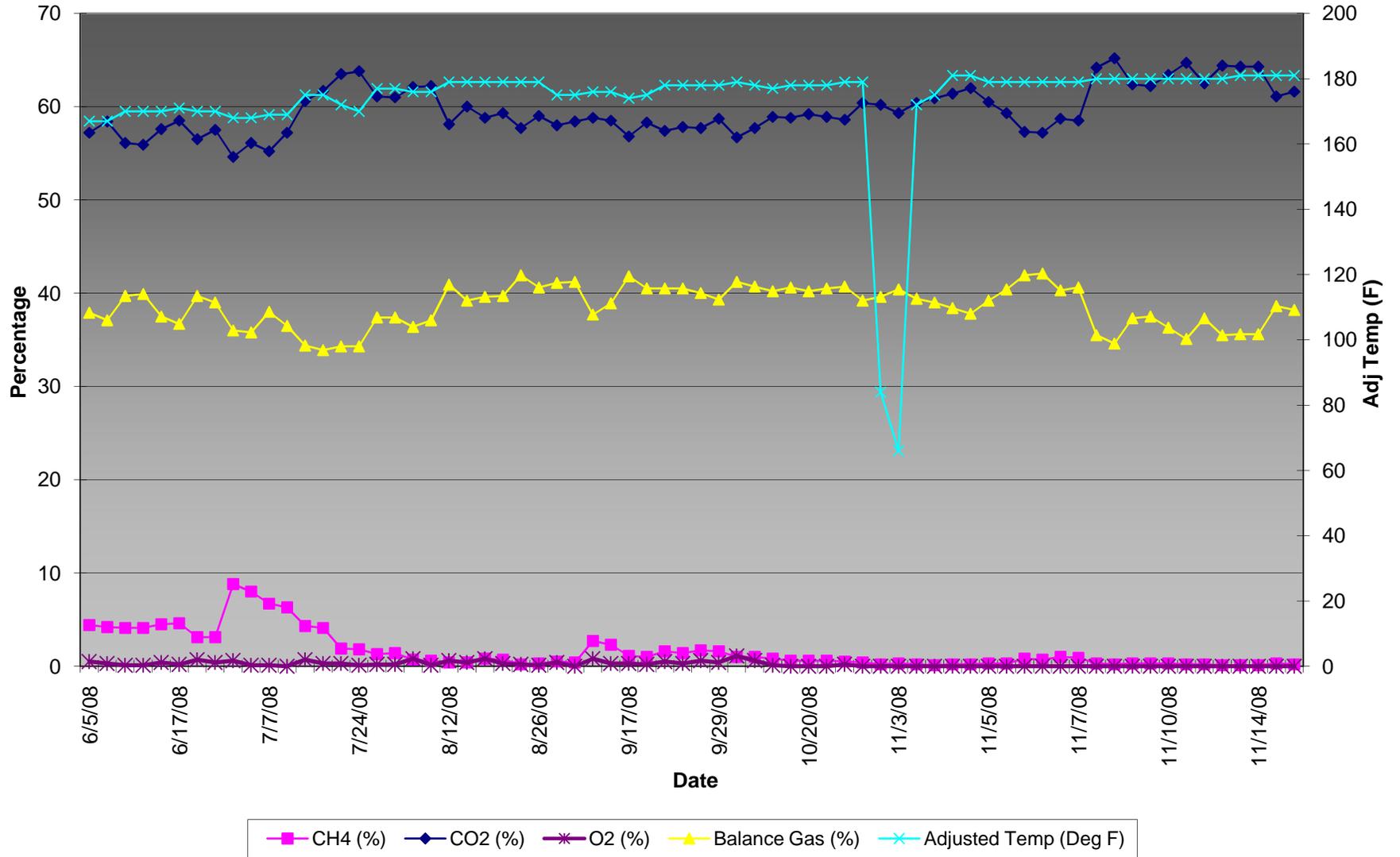


### PW-179



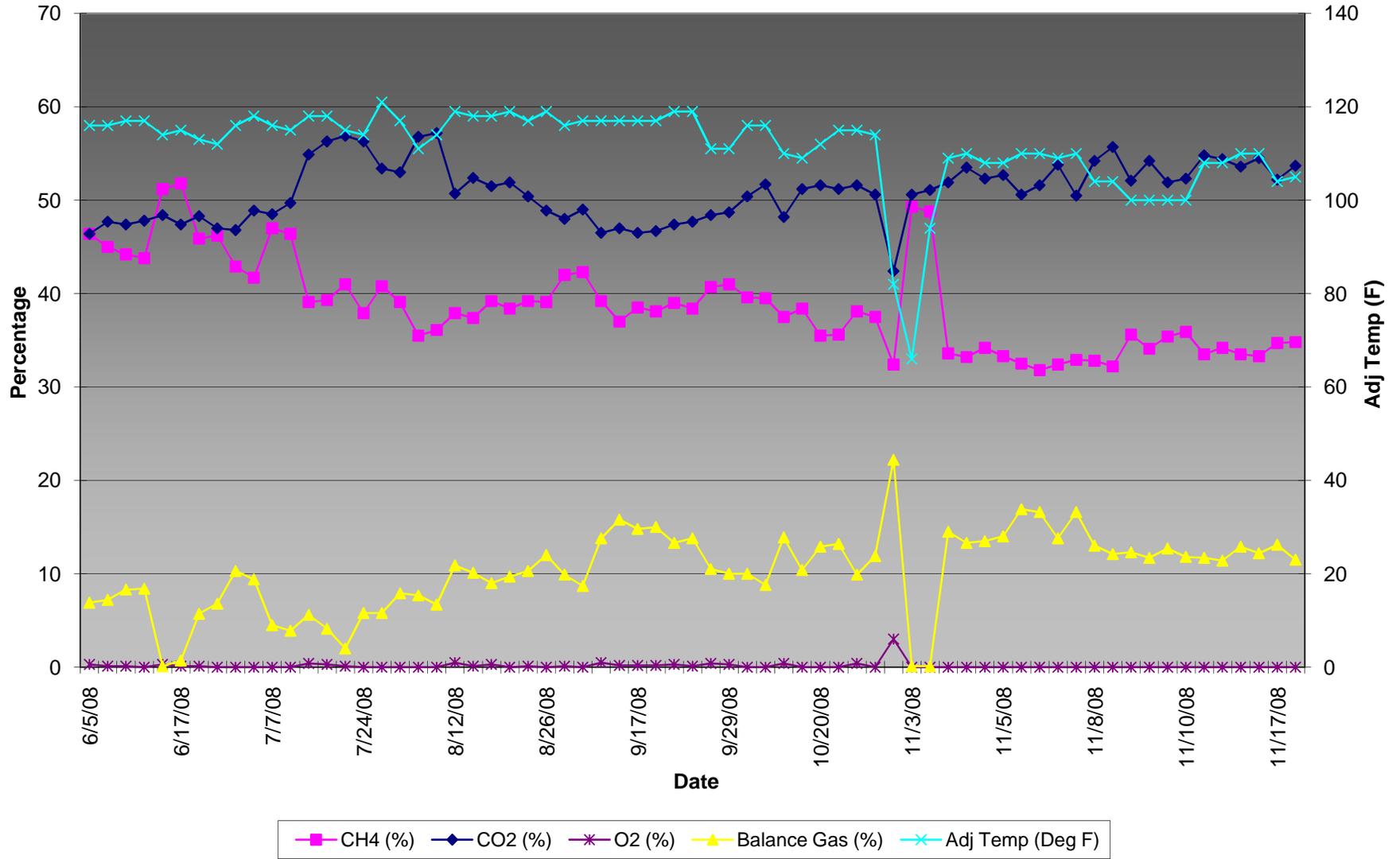
# W-31R Graph

## W-31R



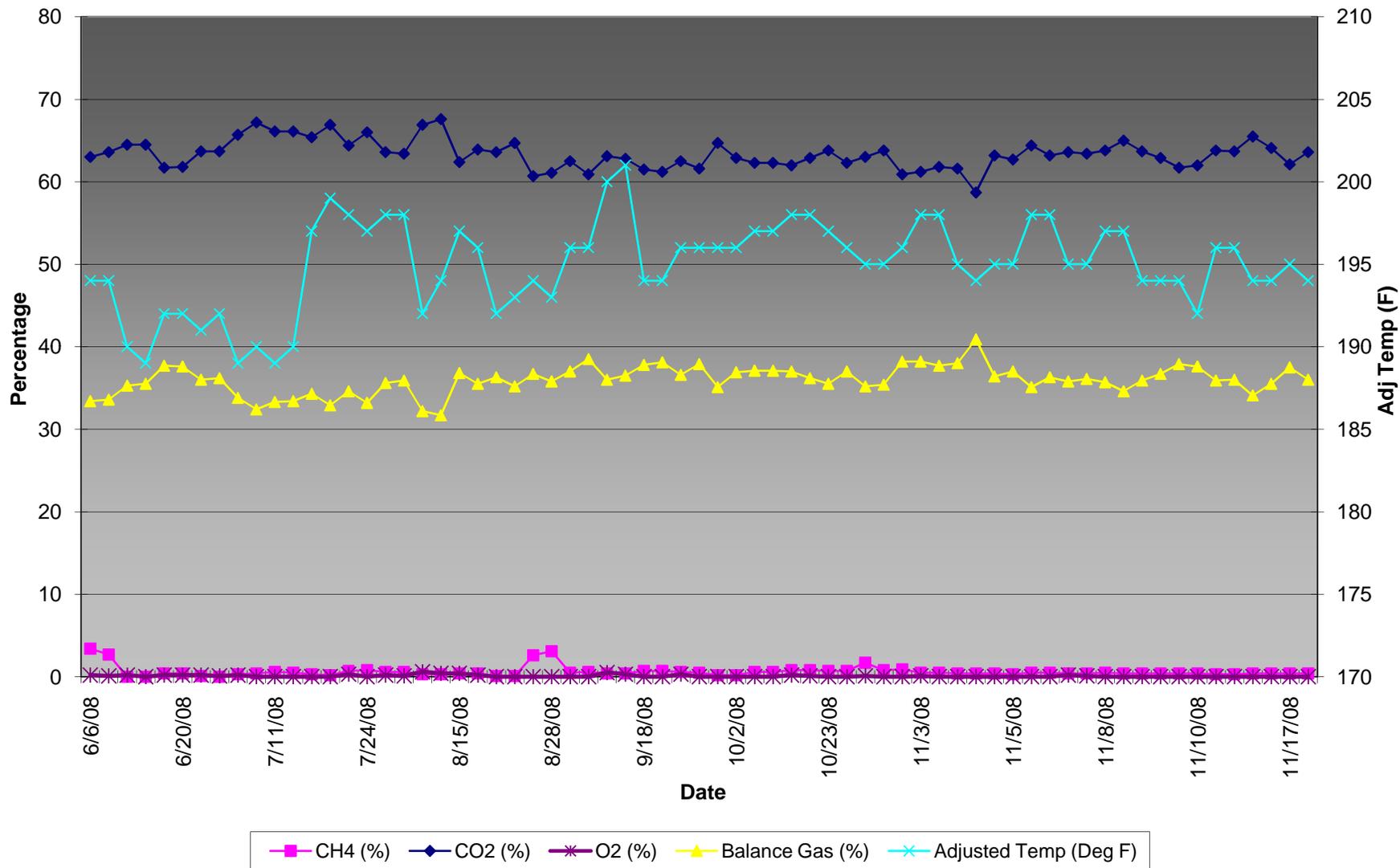
W-32R Graph

W-32R



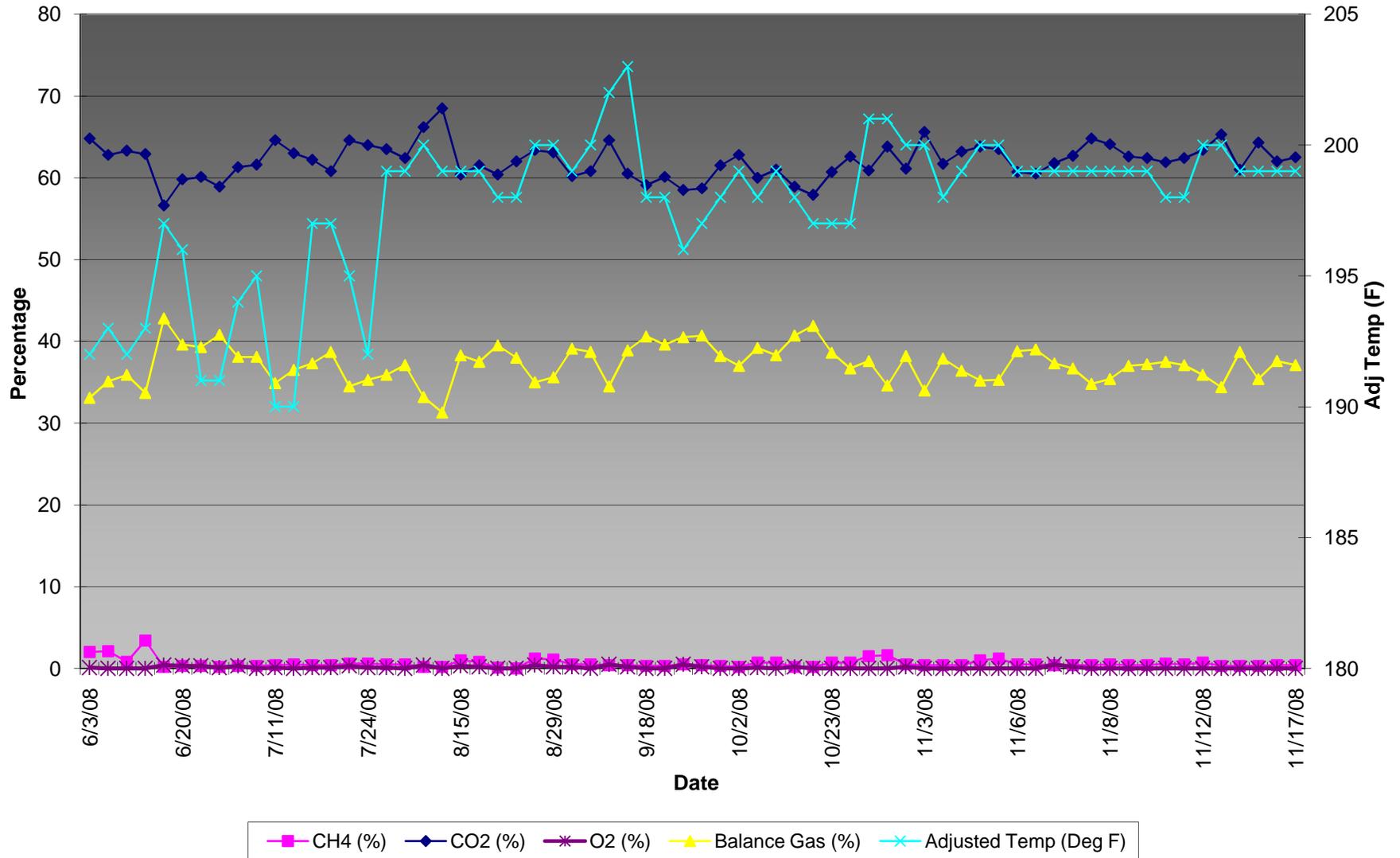
W-56R-M Graph

W-56R-M



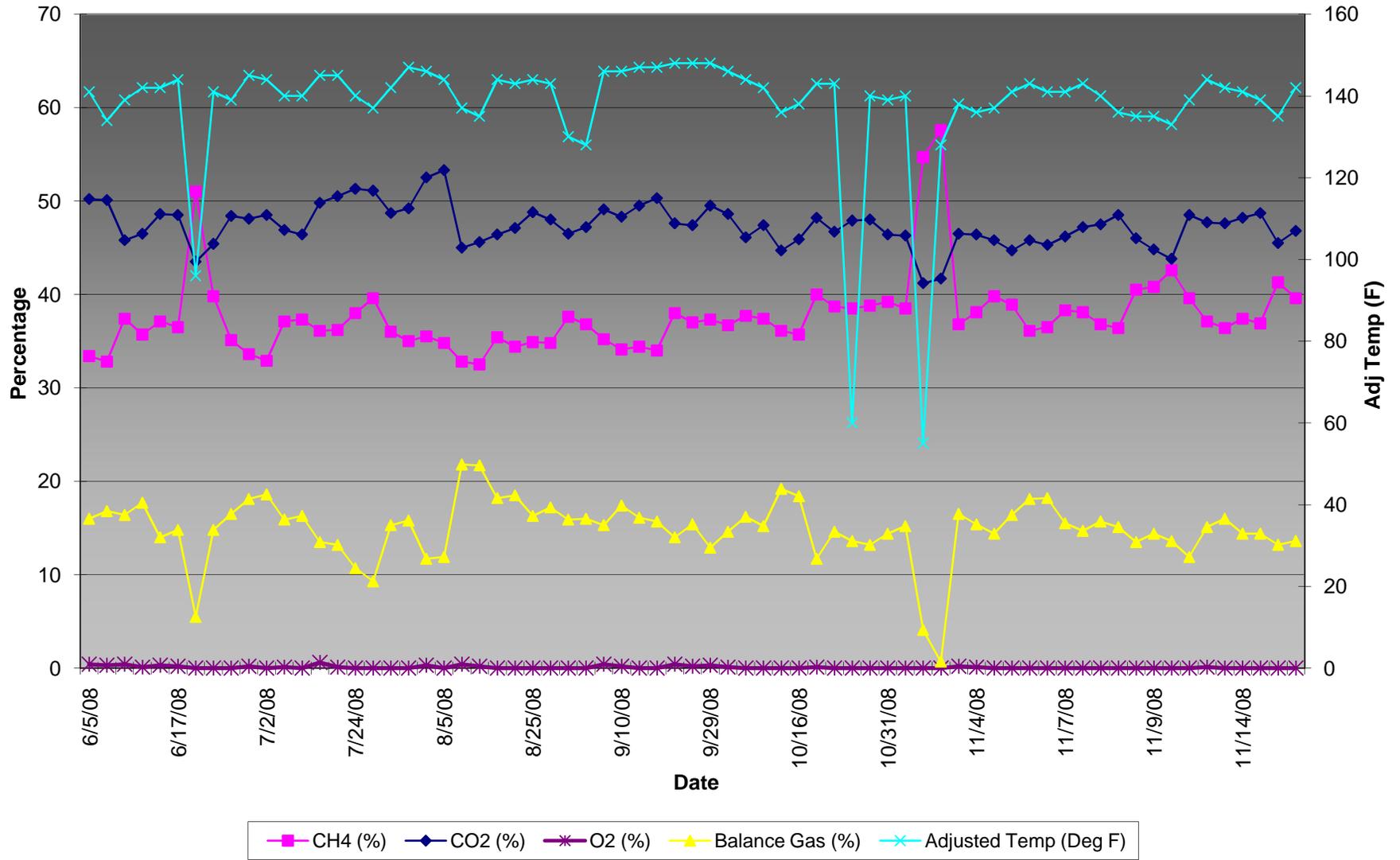
W-56R(3) Graph

W-56R(3)



# W-58R Graph

## W-58R



# ATTACHMENT D

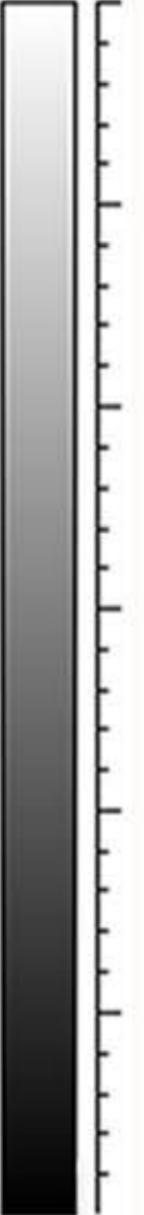
Composite Image by  
Predictive Service LLC. 216.378.3500  
Data Collected 10/24/2008



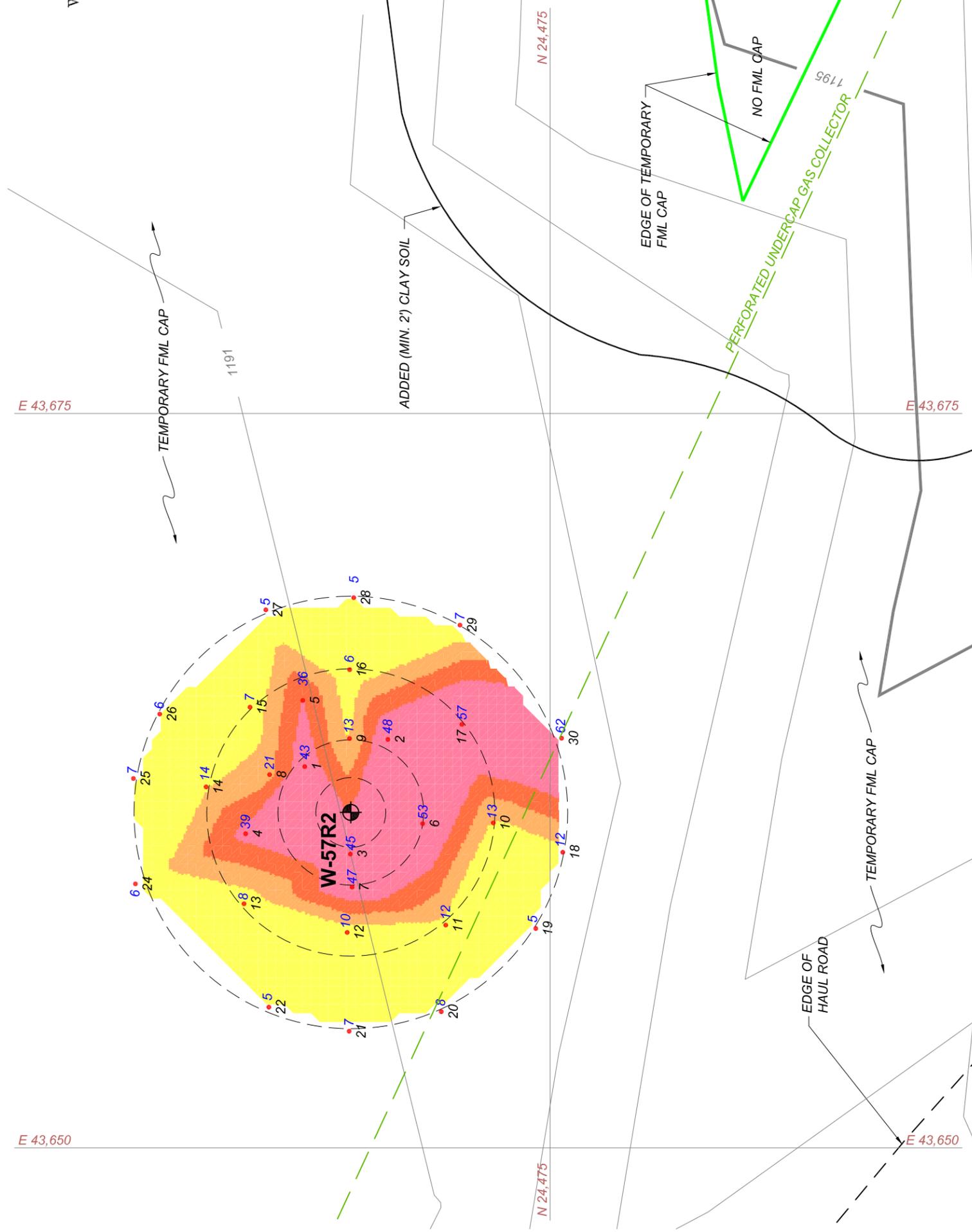
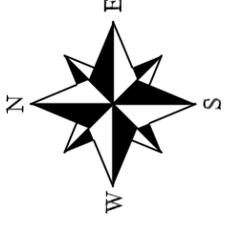
FLARE 4

AMBIENT TEMPERATURE WAS  
43 DEG. F AT TIME OF IMAGE.

W-57R2  
LOCATION



# ATTACHMENT E

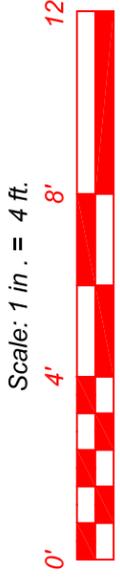


**TEMPERATURE COLOR LEGEND**

- < -5
- -5 to 5
- 5 to 15
- 15 to 25
- 25 to 35
- > 35

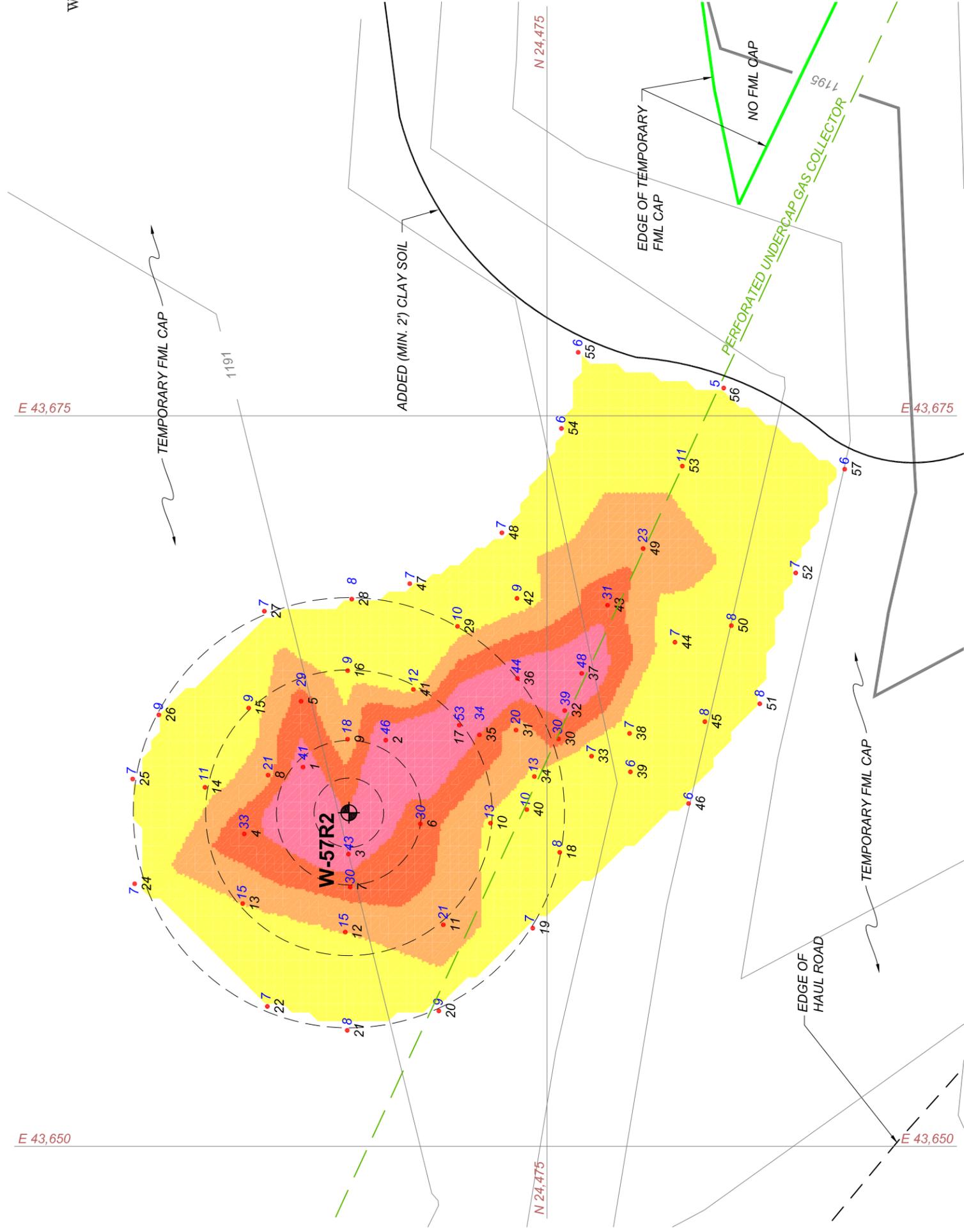
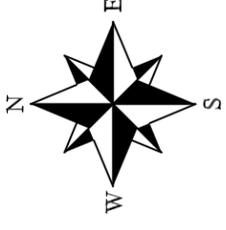
**NOTE:**

THE TEMPERATURES INDICATED THE DIFFERENCE (DELTA) BETWEEN A REFERENCE TEMPERATURE (OBTAINED ON A PIECE OF FML OFF THE LANDFILL SURFACE) AND THE SURFACE TEMPERATURE OBTAINED AT THE MONITORING POINTS.



# COUNTYWIDE RDF

SCALE: 1" = 4', CTR = 1"	REVISIONS	PROJECT: W-57R2
SURVEYED:		
DRAWN: BWS 11/24/08		
CHECKED: BWS 11/24/08		
REVISED DATE:		
		SHEET TITLE: TEMPERATURES 11/05/08
Phone: (330) 364-1631 Fax: (330) 364-4031 e-mail: del@div-eng.com		FILE ID: W-57R2 Temperature 11-05-08
225 Fair Avenue, NE New Philadelphia, Ohio 44663		SHEET 1 OF 1

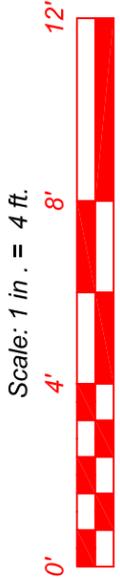


**TEMPERATURE COLOR LEGEND**

- < -5
- -5 to 5
- 5 to 15
- 15 to 25
- 25 to 35
- > 35

**NOTE:**

THE TEMPERATURES INDICATED THE DIFFERENCE (DELTA) BETWEEN A REFERENCE TEMPERATURE (OBTAINED ON A PIECE OF FML OFF THE LANDFILL SURFACE) AND THE SURFACE TEMPERATURE OBTAINED AT THE MONITORING POINTS.

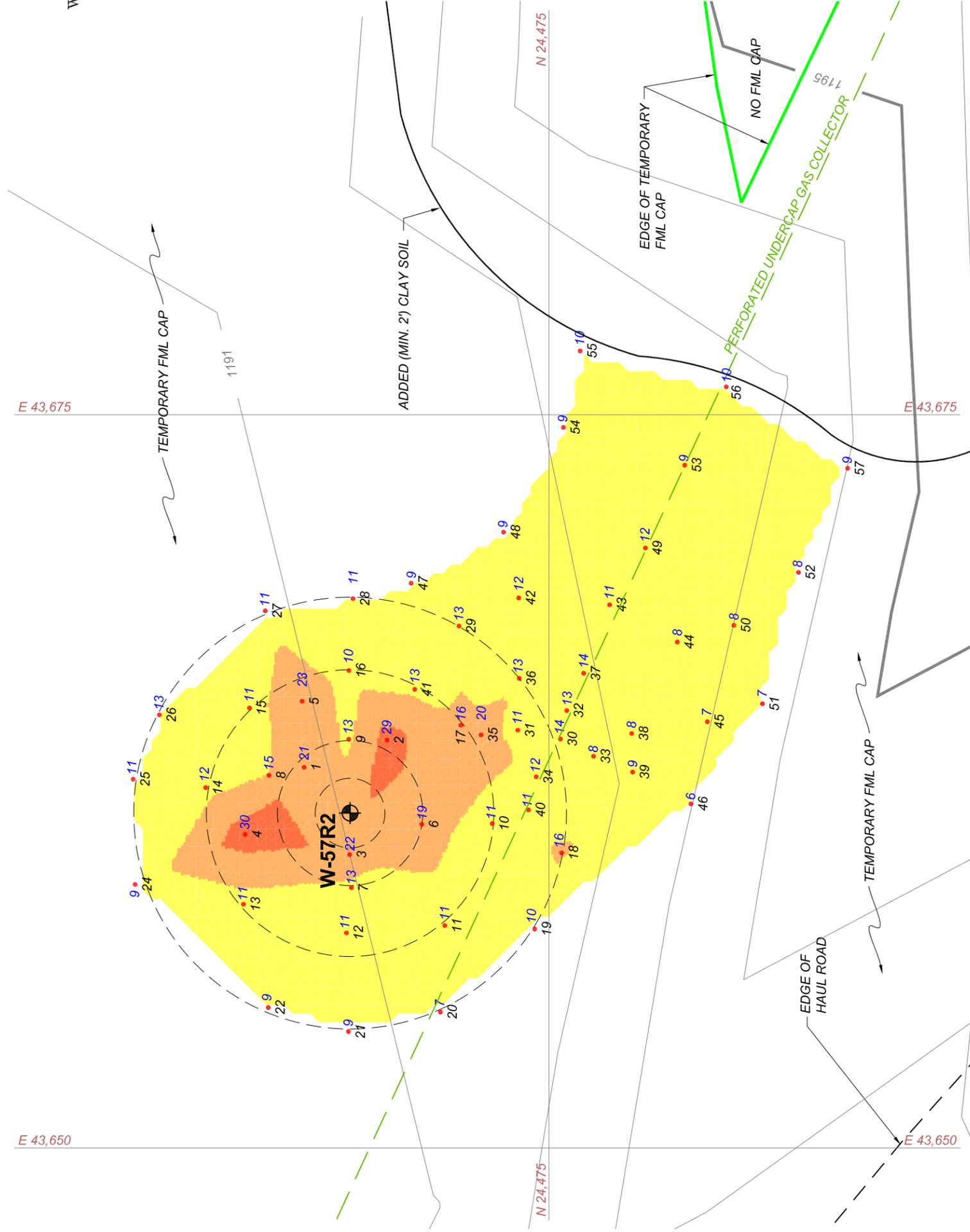
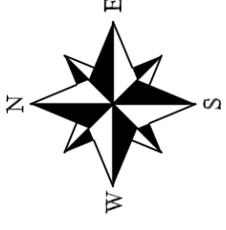


# COUNTYWIDE RDF

SCALE: 1" = 4', CTR = 1'	REVISIONS	PROJECT: W-57R2	
SURVEYED:	DRAWN: BWS 11/24/08		
CHECKED: BWS 11/24/08			
REVISED DATE:			

**DIVERSIFIED ENGINEERING INC.**  
 Phone: (330) 364-1631  
 Fax: (330) 364-4031  
 e-mail: del@div-eng.com  
 225 Fair Avenue, NE  
 New Philadelphia, Ohio 44663

SHEET TITLE: TEMPERATURES 11/12/08  
 FILE ID: W-57R2 Temperature 11-12-08  
 SHEET 1 OF 1

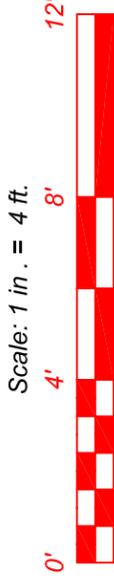


**TEMPERATURE COLOR LEGEND**

- < -5
- -5 to 5
- 5 to 15
- 15 to 25
- 25 to 35
- > 35

**NOTE:**

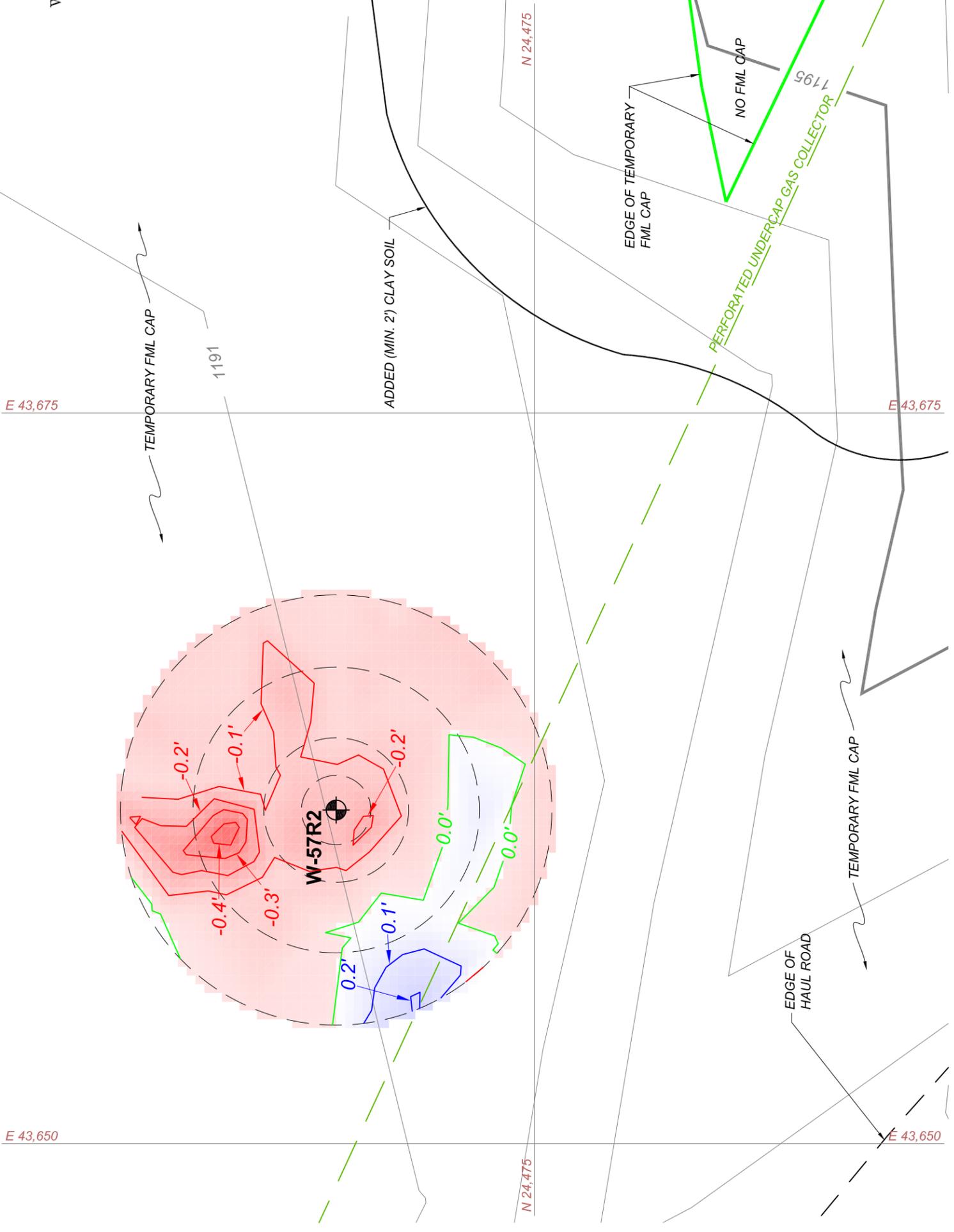
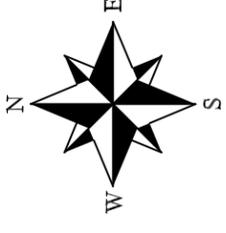
THE TEMPERATURES INDICATED THE DIFFERENCE (DELTA) BETWEEN A REFERENCE TEMPERATURE (OBTAINED ON A PIECE OF FML OFF THE LANDFILL SURFACE) AND THE SURFACE TEMPERATURE OBTAINED AT THE MONITORING POINTS.



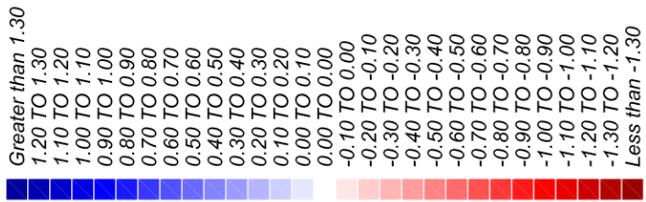
# COUNTYWIDE RDF

SCALE: 1" = 4', CTR = 1'		REVISIONS		PROJECT: W-57R2	
SURVEYED:					
DRAWN: BWS	11/24/08				
CHECKED: BWS	11/24/08				
REVISED DATE:					
				SHEET TITLE: TEMPERATURES 11/19/08	
Phone: (330) 364-1631 Fax: (330) 364-4031 e-mail: del@div-eng.com				FILE ID: W-57R2 Temperature 11-19-08	
225 Fair Avenue, NE New Philadelphia, Ohio 44663				SHEET 1 OF 1	

# ATTACHMENT F

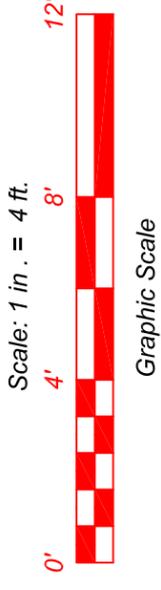


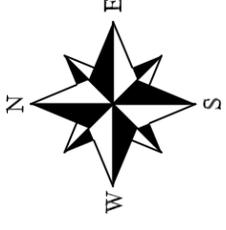
**CUT/FILL LEGEND**



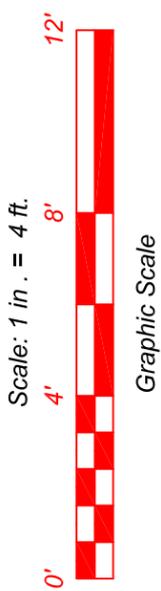
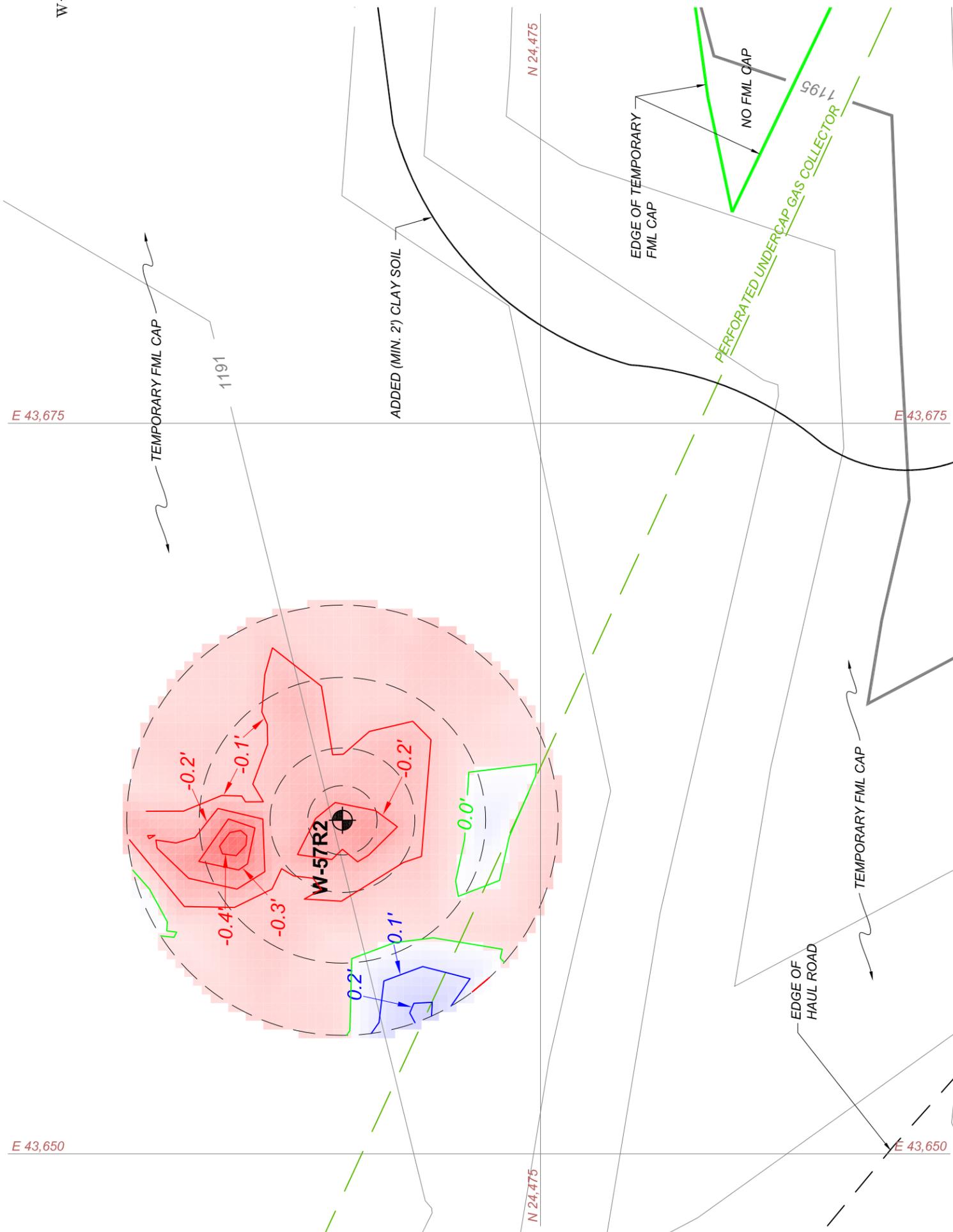
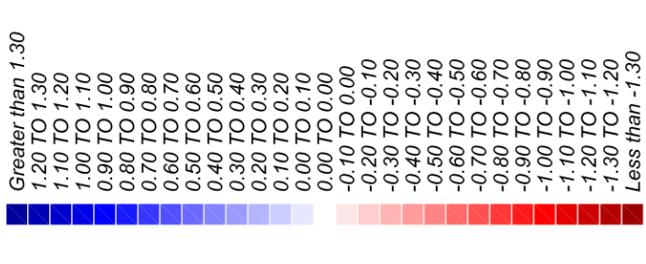
# COUNTYWIDE RDF

SCALE: 1" = 4', CTR = 1'	REVISIONS	PROJECT: W-57R2
SURVEYED: BWS 11/24/08		
DRAWN: BWS 11/24/08		
CHECKED: BWS 11/24/08		
REVISED DATE:		
		SHEET TITLE: CUMULATIVE SETTLEMENT 11/03/08 TO 11/11/08
Phone: (330) 364-1631 Fax: (330) 364-4031 e-mail: dd@div-eng.com		FILE ID: W-57R2 Cumulative 11-11-08
225 Fair Avenue, NE New Philadelphia, Ohio 44663		SHEET 1 OF 1





**CUT/FILL LEGEND**



# COUNTYWIDE RDF

SCALE: 1" = 4', CTR = 1"	REVISIONS	PROJECT: W-57R2	
SURVEYED: BWS 11/24/08			
DRAWN: BWS 11/24/08			
CHECKED: BWS 11/24/08			
REVISED DATE:			

**CUMULATIVE SETTLEMENT**  
11/03/08 TO 11/24/08

SHEET TITLE:

**DIVERSIFIED ENGINEERING INC.**  
Phone: (330) 364-1631  
Fax: (330) 364-4031  
e-mail: [de@div-eng.com](mailto:de@div-eng.com)

225 Fair Avenue, NE  
New Philadelphia, Ohio 44663

FILE ID: W-57R2 Cumulative 11-24-08

SHEET 1 OF 1